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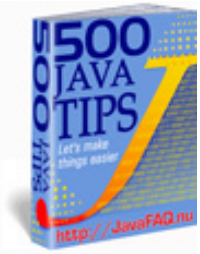
330 Java Tips

Hello dear friend!



I am very glad that you are here!

"330 Java Tips" is my collection of good questions and answers from my site, numerous Java forums and newsletters.

Please read the answer to question that I published on my site about reading file lists from current directory in section "Code Examples" here

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Excuse me for possible mistakes! English is not native language for me.
I will be glad if you send me your corrections of my mistakes!

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Code Examples

Code example: I want to show you one funny thing!

The code is shown below is simplest that you can imagine and does very unusual thing!
It is slightly bigger than "Hello World!" program but does much more.
It lists all files in the current directory if you run it like this:

java test *
(of course after compilation) in DOS/CMD prompt on Windows or in any shell in UNIX.

The program shows all files both in Unix and Windows.
If you do: java test .*
on UNIX it also shows all hidden files.

```
class test{
  public static void main(String args[]){
    for (int i = 0;i < args.length; i++) {
      System.out.println("File " + i + ":" + args[i]);
    }
    if (args.length<=0) {
      System.out.println("No files!");
    }
  }
}
```

You can ask how can we get this list without any file handling functionality in the code?
Indeed looks mysterious...

But in reality everything is very simple.
When you type "*" (wildcard) OS (DOS, Windows, UNIX), not Java (!!!) sends the list of files in the current directory to your program as a list of parameters.
And you see this list...
--
AP (JA)

Q: Can anyone answer this - basic, it seems, despite which the answer eludes me completely - question: how do you have multiple windows in Java without using JDesktopPanes and JInternalFrames??
I don't want that kind of environment. I basically want to be able to press a button/menu option to open up a small menu of options/input/buttons like the tools->internet options menu of IE, and I have no idea how to do it.
Is it actually possible without using JDPs and JIFs?
Is it as simple as creating a separate class for the menu 'mini-window' and creating an instance of it from the main system?

Answer: The example you mention is just a fancy dialog. Read documentation on Dialog/JDialog. Also a single application can instantiate and display multiple top level containers such as Frames/JFrames.

For example

```
import java.awt.event.*;
import javax.swing.*;

public class MultiFrameTest extends JFrame {
  int x = 0;
  int y = 0;

  public MultiFrameTest(){
    super("multiFrame test");
    setSize(200,200);
    JPanel mainPanel = new JPanel();
    setContentPane(mainPanel);
    JButton addFrameBtn = new JButton("Add a frame");
    addFrameBtn.addActionListener(new ActionListener(){
      public void actionPerformed(ActionEvent e){
        addFrame(x,y);
      }
    });

    mainPanel.add(addFrameBtn);
    addWindowListener(new WindowAdapter(){
      public void windowClosing(WindowEvent we){
        System.exit(0);
```

```
        }
      });
      setVisible(true);
    }

    public void addFrame(int a, int b){
      JFrame frame = new JFrame("Frame "+a);
      frame.setSize(100,100);
      frame.setLocation( b* 10, b * 10);
      x++;
      y +=10;
      frame.setVisible(true);
    }

    public static void main(String[] args){
      new MultiFrameTest();
    }
}
--
DB
```

Q: How do I use the DataInputStream and DataOutputStream to transfer a file from the server to the client using sockets in JAVA?

Answer: This will run on a single computer.

```
// Client.java

import java.net.*;
import java.io.*;

public class Client {
  public static void main(String[] args)
  throws IOException {
    InetAddress addr =
        InetAddress.getByName(null);
    System.out.println("addr = " + addr);
    Socket socket =
        new Socket("127.0.0.1", 8080);
     try {
        System.out.println("socket = " + socket);
        BufferedReader in =
           new BufferedReader(
            new InputStreamReader(
              socket.getInputStream()));
        PrintWriter out =
           new PrintWriter(
             new BufferedWriter(
```

```
                    new OutputStreamWriter(
                        socket.getOutputStream())),true);
        } finally {
            System.out.println("closing...");
             socket.close();
        }
    }
}

// Server.java

import java.io.*;
import java.net.*;

public class Server{

    public static final int PORT = 8080;
    public static void main(String[] args)
    throws IOException {
        ServerSocket s = new ServerSocket(PORT);
        System.out.println("Started: " + s);
        try {
            Socket socket = s.accept();
             try {
                System.out.println(
                    "Connection accepted: "+ socket);
                     BufferedReader in =
                        new BufferedReader(
                          new InputStreamReader(
                            socket.getInputStream()));
                PrintWriter out =
                   new PrintWriter(
                      new BufferedWriter(
                        new OutputStreamWriter(
                          socket.getOutputStream())),true);
                 } finally {
                   System.out.println("closing...");
                  socket.close();
                  }
              } finally {
             s.close();
        }
    }
 }
```

by Bob Randall <brandall@pon.net>

Q: Hi, it would be appreciated if some one could tell me where I can find a Java sample

code for a draggable image, i.e. using mouse left button to drag a bitmap from one location on a dialog box and drop it on another location of the same dialog box.

Answer:

Example:

```
import javax.swing.*;
import java.awt.event.*;
import java.awt.Point;
import java.net.*;
import java.awt.*;

// test of dragging various components also mouse event tests


public class DragTest extends JFrame{
  int xPos;
  int yPos;
  int lastXPos;
  int lastYPos;
  boolean first = true;

  JLabel b;
  URL url;
  Image myImage;

  public DragTest(){
    super("Drag Test");
    JPanel p = (JPanel)getContentPane();
    p.setLayout(null);
    try{
       //myImage = Toolkit.getDefaultToolkit().getImage(new URL
         ("http://www.javasoft.com//images//logos//javalogo52x88.gif"));
       url = new URL
          ("http://www.javasoft.com//images//logos//javalogo52x88.gif");
    }
    catch (Exception e){System.out.println(e);}

    ImageIcon icon = new ImageIcon(url, "Here");
    System.out.println("got image "+icon.getImageLoadStatus());
    b = new JLabel(icon);
    b.addMouseListener(new MouseAdapter(){
      public void mouseClicked(MouseEvent me){
        int times = me.getClickCount();
        if ( times <= 1){
          System.out.println("Single "+me.getX()
              +" "+me.getY());
          Point here = b.getLocation();
```

```
        System.out.println("Button is
            at "+here.x+" "+here.y);
      }
      if (times == 2){
        System.out.println("Double");
        me.consume();
      }
      //System.out.println("Clicked = "+times);
    }
    public void mousePressed(MouseEvent me){
      System.out.println("Pressed");
      lastXPos = me.getX();
      lastYPos = me.getY();
    }
});
b.setEnabled(true);
b.setSize(b.getPreferredSize());
//b.setLocation(0,0);
p.add(b);
b.addMouseMotionListener(new MouseMotionAdapter(){

    public void mouseDragged(MouseEvent me){
      // b.setEnabled(false);
      Point currentPos = b.getLocation();
      int curX = currentPos.x;
      int curY = currentPos.y;

      xPos = me.getX();
      yPos = me.getY()-24;
      if (first){
         lastXPos = xPos;
         lastYPos = yPos;
         first = false;
      }
      System.out.println("y = "+yPos+"lastY
              = "+lastYPos+" "+first);
      int deltaX = xPos - lastXPos;
      int deltaY = yPos - lastYPos;
      try{
        Thread.sleep(30);
          if ((Math.abs(deltaX) < 3)&&(Math.abs(deltaY) < 3)){
            System.out.println("Made it");
            b.setLocation(curX+deltaX,curY+deltaY);
            if (Math.abs(deltaX)< 3){
                lastXPos = xPos;
            }
          if (Math.abs(deltaY )< 3){
            lastYPos = yPos;
```

```
            }
          }
        }
        catch (Exception e){}
        // b.setEnabled(true);
        }
      });

      addMouseListener( new MouseAdapter(){
        public void mouseClicked(MouseEvent me){
          System.out.println("Frame "+me.getX()+" "+me.getY());
        }
      });

      addWindowListener(new WindowAdapter(){
        public void windowClosing( WindowEvent we){
          dispose();
          System.exit(0);
        }
      });
      setSize(200,200);
      setVisible(true);
    }

    public static void main(String[] args){
      new DragTest();
    }
  }
--
DB

....add to PDF page only!!!
A: PDF java
http://etymon.com/pj/
IBM's approach:

http://www-106.ibm.com/developerworks/education/transforming-xml/xmltopdf/in
dex.html
```

Q: I would like to know how I can display a gif image on a normal AWT button.
I need a button which displays an Image for my project.
I know that swings button can do this but I am forced to work with AWT. Can you offer any suggestions?

Answer:

```
import java.awt.*;
import java.awt.event.*;
```

```
//class to make an animated button using images.
//Written by Mark Bernard
class ImageButton extends Button implements MouseListener {
  Image i[];
  int select=1;
  int w=0;
  int h=0;
  int iw,ih;

  //The constructor requires 4 images as described below.
  // 1. Greyed out image of the button
  // 2. Normal/unselected image
  // 3. Hover image(if mouse is hovering over the button
  // 4. Pressed image
  //Please note that the image will always take up the entire
  //display of the button. If layout managers are used
  //the image will be stretched to fit the area layed out.
  public ImageButton(Image im[]) {
    super(" ");
    i=new Image[4];
    i=im;
    iw=i[0].getWidth(this);
    ih=i[0].getHeight(this);
    setSize(iw,ih);
    addMouseListener(this);
  }

  public Dimension getPreferredSize() {
    return new Dimension(iw,ih);
  }

  public Dimension getMinimumSize() {
    return new Dimension(iw,ih);
  }

  public void setBounds(int x,int y,int width, int height) {
    w=width;
    h=height;
    super.setBounds(x,y,width,height);
  }

  public void setSize(int width,int height) {
    w=width;
    h=height;
    super.setSize(width,height);
  }

  public void setEnabled(boolean e) {
```

```
    if(e) {
      select=1;
    }
    else {
      select=0;
    }
    repaint();
    super.setEnabled(e);
  }

  public void paint(Graphics g) {
    g.drawImage(i[select],0,0,w,h,this);
  }

  public void mouseClicked(MouseEvent e) {}
  public void mouseEntered(MouseEvent e) {
     if(select!=0) {
       select=2;
       repaint();
     }
  }
  public void mouseExited(MouseEvent e) {
    if(select!=0) {
      select=1;
      repaint();
    }
  }
  public void mousePressed(MouseEvent e) {
    if(select!=0) {
      select=3;
      repaint();
    }
  }
  public void mouseReleased(MouseEvent e) {
    if(select!=0) {
      select=2;
      repaint();
    }
  }
}
```

Q: I have a method with the following signature:

public Element process(java.io.Reader reader)

I usually call this with a java.io.FileReader, to process files from local disk.

Like this:

```
Element root = null;
FileReader fr = new FileReader("config.xml");
root = process(fr);
```

Now, I need to process a file residing on a Http-server, and I have a reference to this file in a java.net.URL.

```
Element root = null;
URL configURL = new URL(http://servername/Path/config.xml);

????

root = process(??);
```

How do I convert/call my URL to a Reader object so I can call process(Reader reader)???

Answer: The following example might be helpful to you:

```
import java.net.*;
import java.io.*;

class Dag {
  static URL url = null;
  static int[] letterCount = new int[256];

  public static void main(String[] args) {
    try {
      url = new URL("http://www.orion.no");
    } catch (MalformedURLException e) { }
    try {
      letterCount = process(new
      InputStreamReader(url.openConnection().getInputStream()));
    } catch (IOException e) { }

    for (int i=0; i<256; i++) {
      if (letterCount[i]>0) {
        System.out.print((char)i+" "+letterCount[i]+",\t");
      }
    }
  }

  public static int[] process(Reader reader) {
    int c = 0;
    int[] counters = new int[256];

    while (true) {
      try {
        c = reader.read(); System.out.print( (char) c );
      } catch (IOException e) { }
```

```
        if (c<0) { break;}
        counters[c] ++;
      } return counters;
   }
}
```

The program reads from the webpage at http://www.orion.no and outputs the frequencies of all (present) letters.
--
/ Lars-Ake

Q: Could you give me simplest example how to do print in Java? I will work out it myself :-)

Answer: Please compile and run it! It will draw empty rectangle (you see I save your inks!)

```
import java.awt.*;

public class print {

   public static void main(String args[]){
      Frame frm = new Frame("JavaFAQ_test");
      frm.pack();
      PrintJob printJob =
         frm.getToolkit().getPrintJob(frm, "print", null);

      if (printJob != null) {
         Graphics grphcs = printJob.getGraphics();
         grphcs.drawRect(50, 50, 150, 100);
         grphcs.dispose();
         printJob.end();
      }
      System.exit(0);
   }
}
```

--
AP. (J.A.)

Q: I have small advice how to avoid the usage Date for measurement the time difference between two events.
The main idea is that the Garbage Collector collecting only objects that were created by using new().

So if you need to measure the time difference between two events use this:

```
long eventOne = System.currentTimeMills();
long diff = eventOne - System.currentTimeMills();
```

Give the rest to you Garbage Collector!

--
Andrey S.
P.S. This advice was sent directly to us, to info@javafaq.nu
Have you such? Please send!

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Applets

Q: What are restrictions for an applet? What are applets prevented from doing?
Answer: In general, applets loaded over the net are prevented from reading and writing files on the client file system, and from making network connections except to the originating host.

In addition, applets loaded over the net are prevented from starting other programs on the client. Applets loaded over the net are also not allowed to load libraries, or to define native method calls. If an applet could define native method calls, that would give the applet direct access to the underlying computer.

Q: Do I need special server software to use applets?
Answer: No. Java applets may be served by any HTTP server. On the server side they are handled the same as any other file, such as a text, image, or sound file. All the special action happens when the applet class files are interpreted on the client side by a Java technology-enabled browser, such as HotJava browser or 1.x or Netscape 3.x/4.x.

source: http://java.sun.com/products/jdk/faq.html#A8

Q: I know that applets have limited possibility to do many things. It is about network connections, file reading/writhing and more.
Can applet read all system properties and if not how many of them are restricted?

Answer: Applets can read quite many of system properties by using:

String ss = System.getProperty(String key):

java.version
java.vendor
java.vendor.url
java.class.version
os.name
os.arch
os.version
file.separator
path.separator
line.separator

Applets are prevented from reading these system properties:

java.home
java.class.path
user.name
user.home
user.dir

source: http://java.sun.com/sfaq/
--
AP. (J.A.)

Q: I write my first applet and it become very huge! It is an applet but looks like huge Java Application.
Could you point me what is most is important for having a small applet?

Answer:
1. Use compiler optimization: javac -O But check it the size anyway. Sometime it makes the code bigger..
2. Use jar files instead of class files
3. Try to use inheritance as much as possible: than more code you can reuse than less new lines you have to add.
4. Try to use standard APIs. Often they are better optimized in size than some private exotic packages. Of course often they have better methods and so on but try to use efficiently what we have already!
5. Use short names.
6. Do not initialize big arrays because. They will be initialized and put directly into bytecode. You can do it later on the fly

Please if you know more methods to make an applet smaller mail us and we will add your comments here!
--
AP. (J.A.)

Q: Why do I get message like “wrong magic number” when I am trying to run applet? What is a magic number?

Answer: The first thing a JVM does when it loads a class is check that the first four bytes are (in hex) CA FE BA BE. This is the "magic number" and thats why you are getting that error, you are trying to load a file that isnt a class and so the class loader in the JVM is throwing out that exception.

Make sure you transfer the class files to site in binary mode, rather than text or ASCII mode. An error from the browser saying "cannot start applet ... bad magic number" usually means that one of the class files on the server is corrupted. '
Replace your class binary files on the web server; clean up the cache of your browser, and reload your applet.

Q: I've got problems with the Socket class (network)

I've got problems with the Socket class. I use it inside an applet (I've written a small chatbox). I have code like this:

Socket s = new Socket("192.168.0.4", 13780);

When the server I'm connecting to is on the same machine as the client, it works.
When the server is an other machine, both NS and IE give an error message like:

Security:Can't connect to 192.168.0.4 with origin ''

Does anyone know how I can fix this??

Answer: The standard security concept for an applet is the 'sandbox'. An applet can't talk outside it's memory space, can't talk to any files at all, and cannot talk to anything on the internet except the same machine that it's 'parent' HTML page originated from. So your applet can never talk to 192.168.0.4 unless the HTML came from 192.168.0.4

Q: How do I view the error output from my Java applets in IE?

Answer: The file windows\Java\Javalog.txt contains info about the last Applet loaded in IE. All the System.out messages and exception information is stored here when Java Logging is enabled in IE. To enable Java Logging start IE and select View/Options/Advanced. Select "Enable Java Logging" check box click OK. Restart IE.
In NT4 the file in C:\WINNT\Java

Q: Is there a way to reduce the amount of time that it takes to download an applet?

Answer: There is a way to reduce the amount of time an applet takes to download. What ever classes the Java applet is refering, you cluster them in a JAR file with the help of JAR utility that comes with the JDK version. Check out the help for the options of that utility and make a

".jar" file out of the applets refered classes and images and other relevent data which you want to load.

Use the archive option of the applet tag and assign the .jar file:

```
<applet code="xyz.class" archieve="pqr.jar" width=100 height=100>
</applet>
```

Q: I want to be able to print debugging text messages during the whole applet's lifetime. Is there an easy way to do that???

I'm a beginner in java. Right now i am doing an applet and i want to write messages to the browser window for debugging purposes i.e. to follow how the applet executes. Like when i'm developing an C++ application i usually use lots of "couts" to check values and the programs behavior. Is there an easy way to do things like that when making a Java applet? For me it seems like everything happens in a function called "paint(graphics g)" and that function is only called at the beginning of the applet start. I want to be able to print text messages during the whole applet's lifetime. Is there an easy way to do that???

Answer: you'd be better off doing a
System.out.println("the value is " + whateverValue);

This will show up in the java console. to see it in ie5, do View->Java Console, and in netscape4.7, do Communicator->Tools->Java Console and it will pop up the java console window.

If you are doing it in appletviewer from dos, it will show up in the dos window you used to call appletviewer.

Q: I am writing an applet that will use images. I would like to ship out the images using a jar file that contains all the images that the applet is going to use. I have seen a piece of code that does that in the past, but I don't remember where.

Answer: by David Risner The following is from:
http://developer.netscape.com/docs/technote/java/getresource/getresource.html

```
import java.applet.*;
import java.awt.*;
import java.io.*;

public class ResourceDemoApplet extends Applet {
  Image m_image;

  public void init() {
     try {
```

```
        InputStream in = getClass().getResourceAsStream("my.gif");
        if (in == null) {
          System.err.println("Image not found.");
          return;
        }
        byte[] buffer = new byte[in.available()];
        in.read(buffer);
        m_image = Toolkit.getDefaultToolkit().createImage(buffer);
      } catch (java.io.IOException e) {
          System.err.println("Unable to read image.");
          e.printStackTrace();
      }
  }

  public void paint(Graphics g) {
    if (m_image == null)
    return;

    Dimension d = getSize();
    g.drawImage(m_image, 0, 0, d.width, d.height, Color.white, this);
  }
}
```

Q: I want to use more fonts in my applet... say for example Arial... which is not avilable in the present jdk package...

How can i deal with it?

Answer: import java.awt.Toolkit;
....
Toolkit tools = new Toolkit();
String[] fontList = tools.getFontList();

Q: How can I slow down my applet?

I have a game applet that is running too fast on newer systems that have high-end video cards. Its easy enough to slow down the game by having it sleep between thread cycles, but I need to be able to
determine how fast a users machine is before I determine how long to sleep for.

I have been muddling through the documentation but cannot find any calls that will tell my applet what the users configuration is as regards to CPU speed and other components they may have on their system.

Answer: Simple create a new Date (), then perform a standard lengthy operation on the order of something that takes about one second on your machine, like a long loop, then create another new Date() and compare it to the first. If it takes 1/2 of the time compared to your

machine, then the CPU is probably about 2 times faster. if it takes 3 times the duration compared to your machine, the CPU is probably 1/3 as fast as yours.

Do this dynamically, and it might help with speed changes when there's lots of action happening as well - unless this issue is already being dealt with using threads, that is.
--
by Max Polk

Q: Why do I see applet in applet viewer and do not in a browser?

When I try to view my applet on a web page i get the error

java.lang.NoSuchMethodError: java/lang/Double: method
parseDouble(Ljava/lang/String;)D not found

Which is weird as it compiles fine on Borland and with the JDK using applet viewer
Anyone have any ideas what is going wrong?

Answer: The parseDouble method was only added to Java in JDK 1.2
Browsers typically only support Java 1.1
If you have the JRE installed, you can run Java 1.2 applets. But you must also change the HTML code that embeds the applet. Check javasoft.com. I believe they have a program which will automatically change the <APPLET> tag to <EMBED> and add whatever else is needed. It's been a while since I've done applets but I do remember running across a similar problem.

Q: In my applet I have a bunch of gif's in my JAR file. When I try to access a gif using:

Image img = getImage(getCodeBase(), "image.gif");

everything works fine under Microsoft Internet Explorer but it does not under Netscape and appletviewer. Of course I do not have any gifs in my CodeBase directory on server.

Any idea why?????
Answer: Because this is not how you access resources in a Jar file. You need to use getResourceAsStream if you want to access GIFs from Netscape. Look at:
http://developer.iplanet.com/docs/technote/java/getresource/getresource.html
for example code. This same code will work in Sun's Appletviewer.
--
David Risner
http://david.risner.org/

Q: How do I get JVM version in Internet Explorer?

When you open the Java Console through internet explorer, it prints the following useful line at the top:

Microsoft (R) VM for Java, 5.0 Release 5.0.0.3318

We would like to be able to obtain the above String (or atleast the 5.0.0.3318 part of it) through a Java Applet / Javascript at runtime.
Does anyone know of any handy methods that allow access to this String ? I've looked in all the System.properties, but it wasn't there. Is it stored in the user's registry anywhere ?

Answer: just for Microsoft't VM!
try :

```
class test{
   public static void main(String[] args){
      String build;
      build=com.ms.util.SystemVersionManager.getVMVersion().getProperty ("BuildIncrement");
      System.out.println("Using build "+build);
   }
}
```

Real Gagnon from Quebec, Canada
* Looking for code code snippets ? Visit Real's How-to
* http://www.rgagnon.com/howto.html

Q: I wonder if there is a way to find out if a button in an applet has been clicked, no matter which of the buttons in an applet it might be.

Of course I can write, with a particular button (if event.target==button1) but maybe there is a syntax that looks more or less like this (it is an imaginary code just to show what I would like to do)
(if.event.target.ComponentType==Button) etc.
I tried a lot of things with getClass but none of them worked

Answer: Have your applet implement the ActionListener interface, and have every button that's instantiated add the applet as an ActionListener. Then, inside of your applet, have the following method:

```
public void actionPerformed(ActionEvent event) {
   // check to see if the source of the event was a button
   if(event.getSource() instanceof Button) {
      // do whatever it is you want to do with buttons...
   }
}
```

Darryl L. Pierce Visit <http://welcome.to/mcpierce>

Q: Could you suggest how to draw one centimeter grid in applet, please? One cm on the screen must be equal to real cm.

Answer: If you're not all that picky about it, you can always use java.awt.Toolkit's getScreenResolution() to see how far between the lines should be in the grid....that's assuming the applet security allows it.

But have it _exactly_ one cm, you can't do, since the user can always adjust the display with the monitor controls (making the picture wider/taller/whatever), and no computer that I know of can know those settings.
--
Fredrik Lännergren

Not only that, the OS (and thus Java) does not know if I am using a 21" or a 14" monitor and thus can't know the actual physical size of a given number of pixels. By convention, on Windows monitors are assumed to be either 96dpi or 120dpi (depending on the selection of large or small fonts). Java usually assumes 72dpi. None of these values is likely to be accurate.
--
Mark Thornton

Q: Does anyone know how to or where I can find information about determining if cookies are disabled on a client browser making a request to a servlet or JSP (or any server side request handler, for that matter)? Also, is there a way to determine whether or not a client's browser has style sheets enabled?

Answer: To test if the client has cookies enabled, create a cookie, send it, and read it back. If you can't read it back, then the client does not accept them. It's not a clean way of doing it, but it's the only way (that I know if).

As for CSS, there is no way to know if they allow CSS. Different versions of the browsers support varying levels of CSS. You can get the browser type from the request object and then make decisions based on that.

Q: How can two applets communicate with each other? Have you some examples?

Answer: You will occasionally need to allow two or more applets on a Web page to communicate with each other. Because the applets all run within the same Java context-that is, they are all in the same virtual machine together-applets can invoke each other's methods. The AppletContext class has methods for locating another applet by name, or retrieving all the applets in the current runtime environment

---

```
import java.applet.*;
import java.awt.*;
import java.util.*;
```

```
// This applet demonstrates the use of the getApplets method to
// get an enumeration of the current applets.

public class ListApplets extends Applet {
  public void init() {
    // Get an enumeration all the applets in the runtime environment
    Enumeration e = getAppletContext().getApplets();
    // Create a scrolling list for the applet names
    List appList = new List();
    while (e.hasMoreElements()) {
      // Get the next applet
      Applet app = (Applet) e.nextElement();
      // Store the name of the applet's class in the scrolling list
      appList.addItem(app.getClass().getName());
    }
    add(appList);
  }
}
```

I hope that did it!
by 11037803

Here are some useful links on applet to applet communication. I don't know if they will solve your problem but these are a variety of good approaches for this type of issue.
http://www.javaworld.com/javaworld/javatips/jw-javatip101.html
http://www.twf.ro/calculatoare/TricksJavaProgramGurus/ch1.htm
http://www.galasoft-lb.ch/myjava/CommTest/backup00/
http://www.rgagnon.com/javadetails/java-0181.html
http://www.2nu.com/Doug/FAQs/InterframeIAC.html
by Mickey Segal

Q: I would like to ask if there 's anyway that I can use the same program run as an applet or application?

Answer: You would have to provide at least a main() for the application part, and init(), start(), stop(), destroy() for the applet part of your program. Your class could simply display the applet within a Frame.

Example:

```
class Foo extends Frame {
  public Foo(String title){
    //...
    Foo applet = new Foo();
    applet.start();
    add(applet, "Center");
    //...
  }
```

main()is function of course, not constructor
--
Alex

Q: Is it possible to run a java applet in a dos window (win98 se)?

Answer: No. A dos window is a character device. You can use the applet viewer program that comes with the JDK though.
--
Mike

Q: Is there a simple way to tell if a PC online or not from within an applet?

Answer: Not without either server-side support or signing the applet, since applets are not allowed to connect to other hosts than the one they are downloaded from. Best approach, I suppose, would be to ping the target from the server.
However, this is not quite full proof because of firewalling: my pc, for example, will not answer to pings.
--
Michiel

Q: Is it possible to close browser from applet?

Answer: Yes, use this (tested):

```
//////////////////////////////////////////////////
import java.applet.Applet;
import java.awt.*;
import java.awt.event.*;
import netscape.javascript.JSObject;

class CloseApplet extends Applet
implements ActionListener{
  protected Button closeButton = null;
  protected JSObject win = null;

  public void init(){
    this.win = JSObject.getWindow(this);
    this.closeButton = new Button("Close Browser Window");
    this.add(this.closeButton);
    this.closeButton.addActionListener(this);
  } // ends init(void)

  public void actionPerformed(ActionEvent ae){
    this.win.eval("self.close();");
  }
```

```
} // ends class CloseApplet
//////////////////////////////////////////////////
```

and the HTML needs to have MAYSCRIPT enabled.

```
//////////////////////////////////////////////////
<HTML>

<HEAD>
<TITLE>Integre Technical Publishing</TITLE>
</HEAD>

<BODY BGCOLOR="#FFFFFF">
<DIV ALIGN="CENTER">
<APPLET WIDTH="150" HEIGHT="30" CODE="CloseApplet.class"
  CODEBASE="java/" MAYSCRIPT>
</APPLET>
</DIV>
</BODY>

</HTML>
//////////////////////////////////////////////////
```

Here's the API:
<http://home.netscape.com/eng/mozilla/3.0/handbook/plugins/doc/Package-netscape.javascript.html>

It's small enough that you could include it in your JAR if you'd like. But most users will even have it on their systems.
It says "Netscape," but I know that IE understands it fine.
--
Greg Faron
Integre Technical Publishing

Q: Is it possible to run an Applet inside a JAVA application?

Answer: An applet is just another class that can be instantiated:
Applet myApplet = new MyApplet();

where MyApplet is the name of the applet class that you have written and then added to a container of some kind
myFrame.add(myApplet);

..but you need explicitly call the init() method that a browser would normally call "behind the scenes":
myApplet.init();

--
artntek

Q: I want to bypass the security sandbox so that my Applet loaded from IE can read and write files on the client side:

(1)configure the server as trust side, (2)install my own security manager to override those checks.
Will that work? Do I still need to have my Applet signed?

Answer: AFAIK this will not work. "Core Java II" says on page 716:

Once the program installs a security manager, any attempt to install a second security manager only succeeds if the first security manager agrees to be replaced. This is clearly essential; otherwise, a bad applet could install its own security manager.
Sign the applet and make the Security calls that request the access you need. If the user consents, your code will be allowed. If they don't, it'll fail.

Be aware that the Netscape security model is not that of the Java specification, and if you want to run there, too, you'll have to find a way of dealing with the discrepancy. Netscape's developer Web site includes the documentation for their model, as well as stub libraries you can compile against.

For information on the Java security model (Sun sanctioned version), check out these Web pages (chosen from the results of the Google search "Java Security Model"):

http://java.sun.com/security/

http://java.sun.com/security/SRM.html

http://www.sans.org/infosecFAQ/code/java_sec.htm
--
Randall Schulz, Michael Pellaton

Q: I just started to do Java programming. How can I bring the system standard output (what you see on your telnet window) to display in an applet?

I want to do:

system(myprogram);
then I want the screen output to be in my applet.

Answer: There is no system() method in the standard API. This functionality in Java is provided by the java.lang.Runtime class. Runtime allows you to capture standard output from an external process you started.

Q: How does one remove or replace the message "Java Applet Window" at the bottom of a frame?

Do not confuse this with the status message at bottom of a browser.

Answer: This can be done.

Use the .java.policy file in the user|home directory with following contents:

```
grant {
    permission java.awt.AWTPermission "showWindowWithoutWarningBanner";
};
```

--
Ganesh

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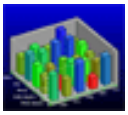

Databases & beans

Q: Anybody does know a freeware JDBC driver for a dsn-less connection to MS SQL-Server? Would even consider a "cheapware" version.

Answer: Go to http://industry.java.sun.com/products/jdbc/drivers and search for Microsoft SQL Server. Any Type4 (i.e. pure Java) driver should work without a DSN.

The only free one I'm aware of is at http://www.freetds.org - but it is rather limited in what it can do. You'd need to try it out to see whether it fits your requirements.
--
Stefan
P.S. DSN - Data Source Name

Q: I just want to know which programs and virtual machines you have to have to make and run enterprise java beans...

Answer: To compile and run Enterprise JavaBeans, you need a couple of things.

First, you need the J2EE SDK. This kit includes APIs full of packages which are considered extensions to the standard Java language APIs, as well as other tools, which come with the J2SE SDK, which you should already have. Install the SDK and make sure its jar file is in your development environment's classpath.

Second, you need a container, which in this case you can also refer to as an application server, though technically a container is just one part of the server. The container acts as a liaison between the client object and the Enterprise JavaBean. When you talk to an Enterprise

JavaBean, you actually talk to a proxy (a substitute), and the proxy, which knows how to do networking stuff, talks to the container, which in turn talks to the actual implementation object which is what you think of when you think of an Enterprise JavaBean.

The J2EE SDK, fortunately, comes with a server/container, as well as a GUI-based tool which allows you to deploy your Enterprise JavaBeans in the server. See java.sun.com/j2ee.

Third, you need a lot of patience. The learning curve is rather steep unless you have a lot of experience doing network
programming. Enterprise JavaBeans are designed to abstract out networking and storage logic, which ends up being very helpful, but is confusing at first, because so much happens behind the scenes that is not explicitly controlled by your code. For example, when you deal with a single Enterprise JavaBean, at least five different objects are actually being instantiated!

But it's great once you get past the initial learning stage, which can last a while. There are lots of good books on EJB, but I found Ed Roman's "Mastering Enterprise JavaBeans" to be a great primer.
--
Erik

Q: I'm having a hard time figuring out what are the differences between Enterprise Java Beans and Java Beans.

Is there a definitive difference between the two?

Answer: Definitely. JavaBeans are really nothing more than classes that have no-args constructors and follow certain naming conventions (and/or provide a BeanInfo class) to identify properties, methods, and events. JavaBeans were designed for plugging into GUI design tools. Technically speaking, lots of things are JavaBeans... though whether they are intended to be used that way is another matter altogether.

Enterprise JavaBeans are not really used as JavaBeans at all. They run on a different server, in a special EJB container that provides a bunch of restrictions on their class hierarchy, their fields and object relationships (particularly if CMP is used), the Java language features that can be used if you write them, etc.
They are, of course, far from a GUI design thing.
<editorial>They are also, IMHO, far from a good idea and I'd avoid them if at all possible.</editorial>

--> to be continued tomorrow (end of Part 1)

Part 2.
> Please explain why to avoid them in more depth...

Basically, the problem is that Sun has started reflection "activity". I use that term to describe the unnecessary use of reflection when a good solution with static typing would be preferable.

Examples: Standard RMI has always used interfaces to act as common types between client

and server. EJBs abandon this, and just say "well, define all the same methods" with no static checking that you've done so. You then have to write a bunch of "ejbCreate" methods, with exactly the same signature as "create" methods, but needlessly renamed. (Well, you kinda would have to name them in order to stuff them into a class where they don't belong, which is exactly what EJB does.) Then EJBs examine my object's fields (which are supposed to be private), and sometimes the whole thing stops working because I have a field of a type that the container doesn't like.

The result is something that shares basic syntax with Java, but which is really a different beast altogether, with no well-organized bit of documentation on use (because everything is dynamic through reflection instead of working with well-defined methods in well-defined classes for which documentation can be written), and strange and unreasonable constraints on coding.

That said, EJB containers are the only environments that provide anything like CMP, for example. I'm working on a better-designed replacement for EJBs' CMP that doesn't rely quite so heavily on reflection, but I'm unaware of anything widely available.
--
C. Smith

--> to be continued tomorrow (end of Part 2)

Part 3.
It was a poor naming decision on Sun's part. There is no similarity between Java Beans and Enterprise Java Beans except for their name.
All they managed to do was cause confusion just because they liked the cutesy name.

The confusion is reduced when you realize that "Bean" in Java is the cutesy name for that software engineering term, aka buzz word "component", that is something intended to be re-usable as is without change, the software equivalent of the hardware engineers chip.

One note: a JavaBean is intended for use in some type of building tool, but a bean or a set of beans may not have anything to do with the GUI of the resulting application. Most often the intent is that the bean is _configurable_ using some GUI. The typical examples of non-graphical beans are Database access JavaBeans which result in nothing in a GUI, but may communicate with other Beans which are part of the application GUI.

I was annoyed a few months back when I attended a Sun training, which included coffee bean looking icons, plus various other curious bits of graphics which to me just added clutter. I still don't know what some of the silly figures where supposed to be :-). Some simple UML (some boxes and arrows) would have been much clearer.
--
Comments by Tom Almy, Paul Hill

Q: I want to use MS Access databases in my java app. Where do I start and where can I get the drivers, I am fluent in SQL with Active Server Page experience, so that isn't a program, its just setting up the DB connection in Java.

Answer:

1. From the ODBC control panel, define a system data source name for the specific MS Access database you want to use. Make sure it's a system DSN, not a user DSN. Assume you name it "foo".

2. In your Java application, load the JDBC driver:

```
try {
   Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
}
catch (ClassNotFoundException e) {
     // Shouldn't happen - it comes with the JRE
}
```

3. Create the DB connection using the name of your system DSN from step 1:

```
Connection con = DriverManager.getConnection("jdbc:odbc:foo");
```

That's it. From there on, the connection behaves like a JDBC connection to any other kind of database. See the tutorial for details.
Remember to close the connection - it's best to enclose step 3 in a try/finally block:

```
Connection con = null;
try {
   con = DriverManager.getConnection("jdbc:odbc:foo");
   // Do your stuff
}
finally {
    if (con != null)
    con.close();
}
```

--
Phil Hanna
Author of JSP: The Complete Reference
http://www.philhanna.com

Q: I used JDBC driver to connect Microsoft SQL server Database. It is no problem besides display Chinese word...

Answer: You can try

```
public String fromDB(String in) {
    try{
       return new String(in.getBytes ("Iso8859-1"),"Big5");
    }
    catch(Exception e){
       return "";
   }
}
```

This is the problem at the encoding of string.

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Distributed systems

Q: Has anyone ever tried anything like this or am I asking for trouble trying to write a program like this?....
I plan to use JBuilder to create a Java GUI that will use Perl to invoke system calls.
The GUI will be run in Windows(NT) while the system calls will be invoked in Unix.

Answer: Sure, why not? Seems to me it should be quite doable. Use Java code to build the GUI and cross the network (for instance using RMI), then invoke the Perl interpreter as an external process, or possibly use JPerl (see http://www.perl.com/CPAN-local/authors/id/S/SB/SBALA/) from there. Or use a different distributed objects architecture to connect Java and Perl objects over the network...

About serialization...

If I have a class that implements the Serializable interface, but it has member variables which reference objects that do not implement the Serializable interface, it appears that I can't serialize an instance of the class. I keep getting:

java.io.NotSerializableException

for one of the objects referenced by a member variable.

Am I correct, or am I just missing something. Also, if anyone knows a work-around to serialize non-serializable objects, I'd like to hear about it. Unfortunately, I have no control over the classes I'm trying to serialize, so I tried putting a serializable wrapper around them , but that

didn't work.

Answer: Do you really need to serialize those members of your class which aren't serializable? In other words, make them private:

```
class Foo implements Serializable {
   private Bar bar;
}
```

Do you *need* to maintain the state of the 'bar' variable when serializing/deserializing Foo? If not, simply declare 'bar' as 'transient' and it will be ingored during serialization.

RMI versus Socket communication

I wish to get Java talking to C++ across a network.
Does anyone have any thoughts in terms of performance, ease of development etc.
in :
Wrapping the C++ side with JNI and using RMI for the communications.
versus
Writing sockets code and communicating via http?

Answer: It depends of what kind of application you're writing but I think about
the following :

- with RMI you can have remote REFERENCE instead of having to transfer all the object through the network. The object has just to implement Remote. So it spare bandwith and is good for performance. This is impossible to do if you do through a socket connection, you've to send the all object.
- You've not to take in charge the serialization (which could be not so easy depending of your object structure), neither the connections, etc... All of that is taken in charge by RMI.
- the performance are GOOD (even a bit more than that)
three good points to use RMI, isn't it?

The difficulty added by RMI is the configuration of both client and server (distribution of stubs, rmiregistry, what's happen if firewall). Depending of the environment all of that can be either easy or complicate.
But once that all of that is in place you can extend your application
easily, so it's much more flexible and scalable.

If your needs are small perhaps that you could do your own connection system (but for me it's less scalable and more bandwith consuming and so less performant).
--
François Malgrève

Answer 2: I have done both. If your communication scenarios are diverse and could keep changing, using a remote technology like RMI can help. If the operations are few and/or not likely to change you can save the JNI complexity. Not that it is really hard it just can be fun keeping the JNI code in sinc with the C++ code.

--
Bret Hansen

Q: I need to communicate some data (string) from a Java Applet to an other ASP page in the same frameset. I would like to avoid a server roundtrip and do it all with JavaScript if possible.

Therefore I would like to call some javascript from a Java Applet. It looks like it is not possible without a netscape package. Is that true? Is there a simple implementation of the same functionality (source code) which I could incorporate in my applet?

Answer: Those Netscape packages are part of the current VM of both Microsoft IE 4+ and Netscape 4+. So, by adding the MAYSCRIPT tag to your Applet declaration, in the Java code you can obtain a handle to the document and call functions in it.
by Tom Hall

Q: I'm researching methods by which one JVM can interact with another JVM, which is running on the same machine.

I know that there are various network models, which can be applied if a JVM needs to talk to another one across a network, but in addition to these (which could I guess be applied to JVMs on the same machine) I wondered if you knew of a system of JVM communication that requires less system resources, where the JVMs are both running on the same system.

Answer: CORBA, RMI, HTTP, sockets....
But if you have no TCP/IP stack on your platform, so for Windows it could be clipboard...
--
by dmitry

Q: I have a question about sending a reference to the object via the socket...

I have a question about sending a reference to the object via the socket. Two threads are communicating via sockets running on the same machine. I don't need to send the whole object, but I need to send just
a reference.
Does anyone knows how to do that?
Answer: Reference to an Object? A reference is only valid within the same memory space! If you want to be able to invoke methods on an object remotely, then you will need to use a remote technology like RMI, CORBA, or some such.
--
by Bret Hansen

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File Systems - I

How does Java read the text files? Can Java read the files that are in other formats? Is the read file method in Java only recognizes the file in .txt or other text format?

Answer: Java can read any text file (using a java.io.FileReader for example), the attribute at the end is an indictor and thus is not relevant as long as the actual code read is in the correct format. I It can read files that are in other formats bytes etc and if you have a wierd format you could extend the IO mechanism with some work to work with that.

Q: What's the preferred way to copy files in Java?

Renaming is easy, since java.io.File provides a method for that.
But I didn't find a method for copying.

Answer:

```
public static void copyFile(File srcFile, File dstFile)
      throws IOException {
  BufferedInputStream in =
      new BufferedInputStream(new FileInputStream(srcFile));
  BufferedOutputStream out =
      new BufferedOutputStream(new FileOutputStream(dstFile));
  byte buffer[] = new byte[BUFFER_SIZE];
  int count;

  while ((count = in.read(buffer)) != -1) {
    out.write(buffer, 0, count);
```

```
  }

  in.close();
  out.close();
}
```

Note that this doesn't close either of the streams if an exception is thrown - which is precisely the kind of thing that finally blocks are for. (Be careful to make sure you close both streams even if one of the calls to close throws an exception though, and not to try to call close() on null if the streams haven't been set up...).
It's not a full-fledged solution. My proposal is only a draft.
--
Peter

Q: Is it possible to choose a directory path instead of a file path in a swing FileChooser dialog box?

Answer: Assume you have instance chooser of type JFileChooser, invoke...
chooser.setFileSelectionMode(JFileChooser.DIRECTORIES_ONLY);

Q: Is there anyway to find out the creation date of an existing file?

Answer: The only thing you can get with pure Java is the last-modified date, which may or may not be the same as creation date.

Probably the reason the API is limited in this fashion is because not all file systems even store the creation date.

Windows does store it, but you'll need JNI (or possibly some horribly ugly hack with Runtime.exec() and the DOS "dir" command) to get at it.

Q: How to erase the content of (text) file without create/open file again (only do "new FileOutputStream(...)" once)?

Answer: Try java.io.RandomAccessFile.setLength(0) if you're using JDK 1.2 or higher.

If you don't have to keep the file, it may be easier to use java.io.File.delete().

Q: Could some kind person please tell me how to save the object as a file so as the same program can load it again?

Answer: try this program. It saves obect into file:

```
import java.io.File;
import java.io.FileOutputStream;
```

```
import java.io.ObjectOutputStream;
import java.io.IOException;

public class Save{
  public void saveMyObject(String filename, Object obj) {
    File myFile = new File(filename);
    try {
       FileOutputStream fileOutStr = new FileOutputStream(myFile);
       ObjectOutputStream outStr = new ObjectOutputStream(fileOutStr);
       outStr.writeObject(obj);
       outStr.close();
    }catch (IOException e){
      System.out.println("?!!!!!!");
   }
 }
  public static void main (String args[]) {
    Save s = new Save();
    Object myObject = new Object();
    String test = "test";
    myObject = (Object)test;
    s.saveMyObject("myfile", myObject);
 }
}
```

If you open myfile you will see that this object includes our string "test"
In the same manner you can read this object from file...

Q: Can anyone write me a short method that lets me know what files are in a particular directory?

For example, I want to know that directory, d:/temp/aaa, has files a.txt, b.java, b.class.
Also related to this, how do I find out what folders I have?

Thanks in advance.
Answer: use our program as a base and add checking for the files and directories you need to find!

here it is:

```
import java.io.File;
public class Save{
  public void showDirectoryList() {
    File dir = new File("d:/temp/aaa");
    File[] list = dir.listFiles();
    for (int i=0; i<list.length; i++) {
      if (list[i].isFile()) {
        System.out.println("File "+list[i].getName());
      } else if (list[i].isDirectory()) {
```

```
            System.out.println("Directory "+list[i].getName());
        }
      }
    }
    public static void main (String args[]) {
      Save s = new Save();
      s.showDirectoryList();
    }
}
```

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File Systems - II

Q: How do I delete a file in Java? I have programmed a Java application that needs to delete a file, but I couldn't find anything on the topic.

Answer: in java.io.File there is delete
public boolean delete()

Deletes the file or directory denoted by this abstract pathname. If this pathname denotes a directory, then the directory must be empty in order to be deleted. Create a new File object representing the file, and then use the delete () method. If you use the Microsoft JVM, make sure the file is not shared before you delete it, otherwise that will not work (the delete () method returns "false").

Q: I need to read C:\test.doc for example and store it somewhere for my future use. I don't know anything about security. Part 1

Answer: If you want to read a file on the local file system in an applet, you are going to digitally sign the applet, and the user of the applet is going to indicate trust in the signature. How you go about this depends on a number of questions, like:
In which browser(s) will the users be running the applet?
Will a Java plug-in be installed in the browser?
Can the user install a plug-in?

Here are a few tips on some of the sticky points of signing applets...

If you are using the jar signing tools that come with the JDK, you'll find that they will only work with the Java plug-in. Netscape and Microsoft IE don't salute the Sun way of signing applets.

If you can rely on your users to install the Java plug in, you can sign applets using the JDK 1.1.X javakey command. You will also have to have them import your certificate into their 'identitydb.obj' file in their home directory, and mark it as trusted. If importing the certificate is too much to ask, and it usually is, you could create an 'identitydb.obj' containing the certificate, already marked as trusted, and have them download this to their home directory. Be careful not to distribute the 'identitydb.obj' that you used to sign the jar, since that would allow anyone to sign code as you!

JDK1.2.X works in a similar way, but the 'javakey' command has been replaced by 'jarsigner' and 'keytool'. In addition, 1.2 adds granularity to the security model, so that you can assign privileges outside of the sandbox via a policy file. For example you could allow an applet to read files, but not write them. JDK 1.1.X security is kind of an all or nothing proposition.

If you can't count on the Plugin being there, but you know your users will be using Netscape, you can sign use the Netscape signtool. Netscape's signtool is a little different than Sun's. With Netscape's, you put all of your class files into a directory, like signdir, and then run something like this:
./signtool -k MyCert -Z MyApplet.jar signdir
The 'MyApplet.jar' file will be created, and, of course, you would already have to have MyCert in your security database. You can generate a test certificate through signtool, but it's only good for a couple of months.
--
Joe Morrogh - Excite@Home - The Leader in Broadband http://home.com/faster

Q: I need to read C:\test.doc for example and store it somewhere for my future use. I don't know anything about security. Part 2, Part 1 was published yesterday

Answer 2: I think they want you to go out and buy a cert from Verisign or Thawte, etc. You can also generate your own signing certificate through openSSL, or some other package, but, if you do, you'll need to have them import it into their database as a trusted signer. This can be done with a simple Perl script which sends the certificate with a header of:
"Content-Type: application/x-x509-ca-cert"
You must also add some code to your applet to use the Netscape way of signing. You can download the file 'capsapi_classes.zip' from Netscape. This file contains the Netscape Capabilities API. Basically, all you need to do is import the package and enable privileges as you need them. It is important to enable privileges in the same method (ie. same frame stack) in which you are going to use them. You cannot just enable all the privileges you need in the init method of your applet. The code looks something like this:

```
import netscape.security.*;
public void MyMethod() {

  try {
    PrivilegeManager.enablePrivilege("UniversalFileRead");
```

```
    FileInputStream fis = new FileInputStream("myfile");
  } catch (Exception e) {
    System.out.println(e);
  }
} // end MyMethod
```

You'll need to add 'capsapi_classes.zip' to the archive attribute of your applet tag. I also believe it is possible to grant privileges to a codebase in Netscape without signing. This is done by editing the 'prefs.js' file on the client. Obviously, this is not possible on the internet, but, for an intranet environment, this could be a solution. Anyway, when an applet tries to enable a privilege, the Netscape browser will pop up a window asking the user if they wish to grant the privilege. This decision can be persistent.
The user can manage the privileges they have granted by clicking on the padlock icon in the bottom left corner of their browser window, and selecting the "Java/JavaScript" section.

If your users may be using Microsoft IE as well as Netscape, you'll have to learn the Microsoft security API. I haven't done this yet, but I believe it is possible to code an applet so that it will work in either browser.
Another alternative is to code different versions of the applet, and build the page containing the applet dynamically, based on the "User-Agent". I have found that it is possible in IE to grant universal privileges to an applet, even if it is not signed, but I sure wouldn't recommend doing that.
--
Joe Morrogh - Excite@Home - The Leader in Broadband http://home.com/faster

Q: Is there any method like writeLine()?

Answer: For writing text to files, you can use a FileWriter; for binary data, use a FileOutputStream. Both are in the java.io package. Have a look in the docs, all you need is there. Oh, you might want to wrap your writer/outputstream in a buffered one for more efficiency. Something like this:

```
FileWriter fw = new FileWriter("D:\temp\test.txt");
BufferedWriter bw = new BufferedWriter(fw);
bw.write("Some text on the first line");
bw.newLine(); // have the Writer insert the newline
bw.write("Some more text, followed by an explicit newline\n");
bw.close();
```

Note, that while \n will probably work, newLine() inserts the platform's own
line separator (ie, \r on Mac, \r\n on Windows, \n on *nix).
--
Michiel

Q: Is there a newsgroup on how to use Java for CDs? I mean not CD that install someting but CDs that you browse.

Answer: Strictly speaking, there is no difference between "CDs that install something" and "CDs that you browse". All CDs contain the same file structure. It's up to the operating system to decide what it does with those files. Windows includes functionality to start a special file on the CD automatically, typically to install something.
You read them just as you would any other disk files. To create them, usually you provide a list of files to a creator program.
--
Joona Palaste

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Graphics, AWT, Swing - I

Q: How can I minimise "Flicker" in animation? Solution 1:

Answer: Solution 1:

Override update() : Flickering in animation occurs because default update() method clears the screen of any existing contents and then calls paint(). To reduce flickering, therefore, override update(). Here is how just add the following code to your applet:

```
public void update(Graphics g) {
    paint(g);
}
```

What the update is now doing is just calling paint() and not clearing it, a further refinement to the above will be to override update() method and painting only the region where the changes are taking place. Here is how:

```
public void update(Graphics g) {
    g.clipRect(x, y, w, h);
    paint(g);
}
```

Solution 2 will be described tomorrow

Q: How can I minimise "Flicker" in animation? Solution 2:

Solution 1 was described in our tip yesterday
Solution 2:

Use double-buffering : double buffering is the process of doing all your drawing to an offscreen and then displaying the entire screen at once. It is called double buffering because there are two drawing buffers and you switch between them. Use double buffering only if the above solution alone does not work. The following code snippet describes how to do it.

```
Image offscreenImage;
Graphics offscreenGraphics;
offscreenImage = createImage(size().width, size().height);
offscreenGraphics = offscreenImage.getGraphics();
offscreenGraphics.drawImage(img, 10, 10, this);
g.drawImage(offscreenImage, 0, 0, this);
```

Q: The following app works fine, but when I start it, I cannot close it using the X at the right top of the form...

Please help me on the following. I'm just starting to use java (JDK1.3). The following app works fine, but when I start it, I cannot close it using the X at the right top of the form. What should I add to fix this problem? The source is shown below.

```
import java.awt.*;
import java.awt.event.*;

public class MyApplication extends Frame{
  public static void main(String args[]){
    Frame f = new Frame("MyApp");
    f.setLayout(new FlowLayout());
    f.add(new Button("A"));
    f.setVisible(true);
  }
}
```

Answer: You should add a listener to handle the closing of the window when the X box gets clicked on.

```
f.addWindowListener(new WindowAdapter(){
  public void windowClosing(WindowEvent evt){
    System.exit(0);
  }
});
```

Read on this, and other ways to do it, in the sections dealing with event handling, in whichever Java text you are using.

Q: How can I set a JFrame to be full screen at the start of a program? I want no borders, no

titles and I just want to use the entire screen.

Answer: Try using JWindow instead, that one can be customized to have no borders or titles... as for size, I think you can use setBounds(GraphicsEnvironment.getLocalGraphicsEnvironment().

getDefaultScreenDevice().getDefaultConfiguration().getBounds());
to fill out the entire screen.

Q: Why can not I mix AWT and Swing?

Recently, I have been hearing a lot of people from various newsgroups and website saying, java swing and awt can't be in the same application. They will not work together and they might produce unexpected results. At the same time, i don't hear people saying "why" you shouldn't use swing and awt together. Could someone out there shed some light for me. Is their any logical reason why we shouldn't mix swing and awt in the same application/applet. If there is a problem mixing swing and awt... what are the results, what can happen? I design using IBM's Visual Age for Java 3.0, and I mix swing and awt in the same application/applet, it works fine when testing in the IDE (I haven't tested it outside of the IDE yet). If you have tested application/applets outside of the IDE, please let me know what happened?

Answer: There are findamental incompatibilities in the way they draw themselves.
AWT java classes are not "pure" Java classes, they use underlaying C/C++ native code (dependable on operation system) that can cause different appearence in different OSs.
Swing is pure Java implementation and has no native code at all. Swing applications look the same.
> If there is a problem mixing swing and awt... what are the results,
> what can happen?

Some objects drawn on top of others are not properly occluded. This is most obvious with drop down menus, which have a tendency to stay visible even after you have selected a menu item. Another problem is that if you use AWT components on a JTabbedPane they will not disappear when you switch tabs. There are many similar issues.

Q: Again about difference between AWT and Swing

I have a question: What are the architectural differences between Swing and AWT??

Answer: by Odd Vinje
There are no big architectural differences, the class hierarchy is almost the same. The reason is that Swing is built upon AWT.

The most significant difference is how the components are drawn to the screen. AWT is so called heavyweight components and have their own viewport which sends the output to the screen. Swing is ligthweight components and does not write itself to the screen, but redirect it to the component it builds on. Heavyweight components also have their own z-ordering. This is the reason why you can't combine AWT and Swing in the same container. If you do, AWT will

always be drawn on top of the Swing components.

You can combine AWT and Swing, just don't do it in the same container (e.g. panel, groupbox, etc.) and don't put a heavyweight component inside a lightweight.

Another difference is that Swing is pure Java, and therefore platform independent. Swing looks identically on all platforms, while AWT looks different on different platforms.

Q: I have a JFrame for customer registration with a lot of input fields. In this screen you can create a new customer, get customer with specified customer number and you can update a customer.

In this JFrame is it possible to clear all fields without specifying each field?

Answer: This snippet is for TextFields, you should be able to adapt for JtextFields very easily.

```
public static void resetTextFields(Container c) {
  Component [] components = c.getComponents();
  for (int i = 0; i < components.length; i++ ) {
     if (components[i] instanceof Container)
       resetTextFields((Container) components[i]) ;
     else if (components[i] instanceof TextField)
       ((TextField) components[i]).setText("") ;
  }
}
```

Bye.

Real Gagnon from Quebec, Canada
* Looking for Java or PB snippets ? Visit Real's How-to
* http://www.rgagnon.com/howto.html

Q: Swing is "lightweight" components. Its graphics primitives are implemented in 100% Pure Java. How does it draw pixels on screen?

Does it still rely on any native code to access the frame buffer?

Answer: We mentioned before in our tips that Swing components is 100% pure Java.
It isn't fully correctly if we are speaking about containers on which they can draw. Swing is still based on AWT, and even Swing components must have at least one heavyweight container. In other words, JFrame, JApplet are *not* lightweight.

Q: How can I change the default icon on application window (java cup) to my own?

Answer:
```
window.setIconImage(Toolkit.getDefaultToolkit().getImage("image.gif"));
```

Q: Need I to remove all the listeners on all of the components in the Frame when I close window of the Frame?

I've got a Frame, which has in it a bunch of components, some of which themselves may be containers. Many of the components in this frame have listeners.

When somebody closes the window of the Frame, I want to completely get rid of the Frame, so that the garbage collector will later clean it up, freeing it's memory. However, I haven't yet figured out a way to do this without tracking every single component by myself. Just calling dispose() on the main Frame doesn't seem to be good enough. Calling "RemoveAll()", even recursively, doesn't seem to be good enough.

I *suspect* that the problem may be that I have to remove all the listeners on all of the components in the Frame. Is there a way to get a list of the listeners out of a given component? I really don't want to have to track every single button I add to every single Frame, and every single Listener I add to every single component. If I have to keep track of all of that, it sort of defeats a lot of the advantages of a well-defined object oriented system.

Answer: I think you're slightly confused here. When another object registers as a listener for a component within the frame, it's the component within the frame that is holding a reference to the external object in its listeners list - not vice versa.

Which means you don't really need to explicitly remove every listener that any other object registered on components in the frame.

What you need to worry about is however the listeners that the frame itself registered with some other components that are still alive. If the frame gets disposed without removing these, the objects that were being listened to will retain a reference to the frame and this can cause the frame to stay around as long as these objects which hold these references stay alive.

So look for all Listeners that your frame registered itself as on components external to itself (should be fairly easy to see since you normally do it in your constructor) and remove those before disposing off the frame.
--
Kala

Q: Main disadvantage of Java GUI is that it is often slow. But I have seen also very fast working GUIs. Unfortunately the code is hidden and I do not know the technique for writing of fast Java GUIs.

Answer: I can describe one of main technique you can use. It does not give you full solution, but will certainly speed up your GUI.

The main idea is to use "lazy" initialization. Instead of creating and initializing of all GUI components in constructors during start up time postpone it to later time until you really need. Let say, you have a lot of tab panels with many elements on each tab panel.
Your constructors should be "quite" empty and do not create and initialize those small elements until your tab panel is chosen. You should have very small constructor for tab panel itself and

additional lazy constructor for the rest. It should be called when user clicks on that particular tab.
This does not decrease the full time of initialization, but spreads it up. The user will not feel big delays during start up of your application. You should use these lazy constructors just before you are going to call any paint method.
--
AP. (J.S.)

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Graphics, AWT, Swing - II

Q: I've a question where skillful java programmers sure will laugh about, but I ask nevertheless.
What exactly means >>> Graphics g <<<? How must I use it and why is it so important to use?

Answer: It basically says: "where should I paint? On the screen, on some RAM, on a printer buffer?"
It is sort of a conduit to that medium.
Graphics class is the set of tools, which allows you to set background, colours, fonts; draw lines, circles, arcs, polygons etc to a component. Here is the definition from the class javadoc documentation:

"The Graphics class is the abstract base class for all graphics contexts that allow an application to draw onto components that are realized on various devices, as well as onto off-screen images.

A Graphics object encapsulates state information needed for the basic rendering operations that Java supports.
This state information includes the following properties:

The Component object on which to draw.
A translation origin for rendering and clipping coordinates.
The current clip.
The current color.
The current font.
The current logical pixel operation function (XOR or Paint).

The current XOR alternation color (see setXORMode(java.awt.Color)). "
--R. Green, Gilgames

Q: How can i disable the right click on the label?

I have a JTree and a JPopup: i've forced the code to be able to select the node with a right click and show the popup. The problem is that i can right click on the popup labels to select them, but i'd like to select them only with a left click. How can i disable the right click on the label? Can somebody help me please?

Answer: You can add in an if loop that only executes if the left mouse button is down using code like the following:

```
MouseEvent e;
if ((e.getModifiers() & e.BUTTON1_MASK) != 0)
{ // code for left button click }
```

and just so you know,
InputEvent.BUTTON2_MASK is the middle or scroller button
InputEvent.BUTTON3_MASK is the right button in windows
--
by MSW

Q: Is it possible to change delays that affect appearing, keeping and disappearing of tooltip?

Answer: It was difficult to find the answer but finally I found in "Swing" book that is free to you on our site.
The ToolTipManager is a service class that maintains a shared instance registered with AppContext. We can access
the ToolTipManager directly by calling its static sharedInstance() method:

```
ToolTipManager toolTipManager = ToolTipManager.sharedInstance();
```

Internally this class uses three non-repeating Timers with delay times defaulting to 750, 500, and 4000. ToolTipManager uses these Timer's in coordination with mouse listeners to determine if and when to display a JToolTip with a component's specified tooltip text. When the mouse enters a components bounds ToolTipManager
will detect this and wait 750ms until displaying a JToolTip for that component. This is referred to as the initial delay time.
A JToolTip will stay visible for 4000ms or until we move the mouse outside of that component's bounds, whichever comes first. This is referred to as the dismiss delay time. The 500ms Timer represents the reshow delay time which specifies how soon the JToolTip we have just seen will appear again when this component is re-entered.
Each of these delay times can be set using ToolTipManager's setDismissDelay(), setInitialDelay(), and setReshowDelay() methods.

ToolTipManager is a very nice service to have implemented for us, but it does have significant

limitations. When we construct our polygonal buttons we will find that it is not robust enough to support non-rectangular components.

Q: I know how to make a text box using Visual Basic that can only accept certain keys for example if I wanted to make a box where you can type only numbers in it or letters. However, when it comes to Java I have not been able to figure this out. Is there a way to do this and make a textbox where you can only type letters in it?

Answer: First of all, 'ASCII' is not a synonym for 'text'. ASCII is just one of many ways of encoding text to numeric values. It is 7-bit and only includes values from 0 through 127.

Now, on to your question. With ASCII, 'numbers' and 'letters' are a little easier to check, since the only letters are 'A'-'Z' and 'a'-'z'. However, Java uses Unicode and has all sorts of fun extra characters.

But you do have a few handy methods on the java.lang.Character class such as isDigit and isLetter

Now, if you are using swing, then to achieve what I'm guessing you want is quite simple. Just hook a custom text document to the JTextField you're using and have it do the filtering.

** Here's the part of The Java Tutorial that goes over it
http://java.sun.com/docs/books/tutorial/uiswing/components/textfield.html#validation

Here's someone's Swing FAQ on that
http://users.vnet.net/wwake/swing/faq.html#text_check

Here's a JavaWorld article that describes how to do that to limit the length of input. Shouldn't be too hard for you to change to your specific needs.

http://www.javaworld.com/javaworld/javaqa/2000-05/02-qa-0512-textbox_p.html

All these links were from the first page of a search on http://www.google.com
Google is your friend!
--
John A.Cruz

Q: I'm trying to do some image manipulation (mainly resizing images) in a Linux Servlet/JSP environment, to do that I use the Java 2D API.

This works fine on my Windows development PC, but does not work on an X-less Linux hosting platform. My hosting company is not running X and has no plans to do so.
So my question is, it is possible to use the Java 2D API on a Linux box without an X server running?

Answer Part 1: A frequently asked question in the context of loading images is that of the missing X server. Unix users who just want to load an image via the AWT without displaying it get an error message if there is no X server installed. In fact, the X server is required for that.

java.awt.Graphics methods such as drawLine (), fillOval (), drawString (),... are implemented in the default JVM with native graphical functions (except in some cases for Java2D) : That means that drawLine () finally calls a GDI system function on Windows or X11 function on a X11/UNIX machine even if the drawing is done in an off-screen image using the class java.awt.Image. This ensures the best performance for drawing graphics with Java.
When no X11 Display is available on UNIX machines or when GDI resources are low on Windows, it is impossible to compute off-screen images with java.awt.Graphics methods, even if your program doesn't need to display these images. Typically, this situation happens for servlets returning dynamically generated images like pies, charts or web counters.
It is also impossible to compute off-screen images when the Java security manager forbids access to any Toolkit or the AWT library.

Possible solutions will be published tomorrow! (end of Part 1)

Part 2 (Part 1 in yesterday's tip):

Possible solutions:

1. Install a virtual framebuffer X Windows System server for XFree86. Xvfb (X Virtual Frame Buffer) is an X server that is able to run on machines with no display hardware and no physical input devices.
Xvfb emulates a dumb framebuffer using virtual memory. Xvfb doesn't open any devices, but behaves otherwise as an X display. Xvfb is normally used for testing servers. Using Xvfb, the mfb or cfb code for any depth can be exercised without using real hardware that supports the desired depths. Xvfb has also been used to test X clients against unusual depths and screen configurations, to do batch processing with Xvfb as a background rendering engine, to do load testing, to help with porting an X server to a new platform, and to provide an unobtrusive way of running applications which really don't need an X server but insist on having one.

2. Use PJA Toolkit available for free at:
http://www.eteks.com/pja/en/

3. Use Java 1.4. beta which available now. This version can work without X-server

Q: I'm currently developing my first actual graphical application in Java, using Swing. I feel that I've got a pretty good grip at object-oriented design and analysis, but I'm somewhat uncertain when it comes to connecting the user interface with the application logic.

Should the GUI components be in the main application class, separated into several classes depending on their position on the screen, or included in the "application logic"-classes? What about the different EventListener I need?

Answer: The biggest, biggest mistake people frequently make is to embed application logic right in with their GUI code. It is almost inevitable with most programmers, unfortunately.

One idea is to use top-level packages, perhaps GUI, kernel, and database.
In the GUI package, have one package for each frame or main thing, like gui/main, gui/login, gui/help, gui/detail, etc.

From all the many tiny pieces of gui code that see button pushes, get events, enable or disable things based on user authorization level, etc, do *NOT* embed application logic there.

Make all these tiny pieces of gui code call a separate NON-GUI arbiter interface (not class) that has methods like:
* void initialize ()
* void beginSearch (String phoneNumber)
* void login (String user, String password)
* void help (String subject)
* void exitApplication ()

The GUI calls an interface (the arbiter), and the arbiter calls a simple interface to the GUI. This is one scheme that separates the GUI from application logic.
--
Max Polk

Q: I would like to display images of various sizes using JInternalFrame.

1. I want to create a JPanel and paint the image on this JPanel.
2. Create a JScrollPane and add the JPanel to the JScrollPane.
3. Add the JScrollPane into the JInternalFrame.
4. I want to set the size of JInternalFrame to fit the image size.

I am having trouble with the setSize() method of JInternalFrame.
If I don't use this method, the JInternalFrame doesn't appear.
But I cannot seem to find a good way to set its size to match
the image size.

Answer: Basically you have three ways to set the size of JInternalFrame:
You can use either: setSize, pack, or setBounds. When you call pack() instead of setSize, the JInternalFrame calculate the size based on it's content inside.
One way would be to use ImageIcons wrapped into JLabels, add them to your component and call pack() on the JInternalFrame instead of a fixed size.

As an alternative way instead of overriding the paintComponent() of your JPanel, what you could do as well, of course and decide whether you like to draw the image on it's original size, scaled or tiled. But you will then need to determine in turn the size of your JPanel, IMO. Thus, I think, it might be the better approach to use ImageIcons instead.
--
Linda

Q: I need some picture icons for my application that I'm building. Could someone point me to some place where I could get some pictures?

Answer: We have the copy of Java TM Look and Feel Graphics Repository on our site here: http://javafaq.nu/java/graphics/java-look-and-feel.shtml
--
John

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General Java Questions - I

Q: Is JavaScript the same as Java?

Answer: NO! An Amazingly large number of people, including many web designers, don't understand the difference between Java and JavaScript. Briefly it can be summed up as follows:

Java was developed by Sun Microsystems. Java is a full-fledged object-oriented programming language. It can be used to create standalone applications and applet. Applets are downloaded as separate files to your browser alongside an HTML document, and provide an infinite variety of added functionality to the Web site you are visiting. The displayed results of applets can appear to be embedded in an HTML page (e.g., the scrolling banner message that is so common on Java-enhanced sites), but the Java code arrives as a separate file.

JavaScript on the other hand was developed by Netscape, is a smaller and simpler scripting language that does not create applets or standalone applications. In its most common form today, JavaScript resides inside HTML documents, and can provide levels of interactivity far beyond typically flat HTML pages -- without the need for server-based CGI (Common Gateway Interface) programs.

Some server software, such as Netscape's SuiteSpot, lets web application developers write CGI programs in a server-side

version of JavaScript. Both client-side and server-side JavaScript share the same core JavaScript language, but each side deals with different kinds of objects. Client-side objects are predominantly the components of an HTML web page (e.g., forms, text boxes, buttons). Server-side objects are those that facilitate the handling of requests that come from clients, as well as connectivity to databases.

Q: Is Java open source as distributed by Sun, i.e., all the modules including JVMs?

If not, is anyone else doing an open source implementation?

Answer: Java is not open source project. Though you can get the full source code under a Sun license.

http://kaffe.org does open source implementation.
I read there: "Kaffe is a cleanroom, open source implementation of a Java virtual machine and class libraries. It is also a fun project that was started by Tim Wilkinson and was made successful by the contributions of numerous people from all over the world.
But Kaffe is not finished yet! You can help by developing new and missing functionality, porting Kaffe to new platforms, and testing your Java applications under Kaffe.
Kaffe mostly complies with JDK 1.1, except for a few missing parts.
Parts of it are already JDK 1.2 (Java 2) compatible."
--
John
http://gcc.gnu.org/java/ - The GNU Compiler for the Javatm Programming Language

Q: I will be thankful if anyone tells me why JVM is called virtual machine.

Answer: JVM is called a virtual machine because there is no real hardware which interprets the byte code. If you have done any assembly programming for any microprocessor/microcontroller you will able to understand this. A microprocessor has builtin instruction set to interpret the assemly code. Similarly the JVM is similar to a microprocessor in the sense it has its own instruction set but it implemented in software. That is why it is called a virtual machine!

Q: Do anyone know the difference between java and C#.

Answer: They are different languages. Java has been around for about five years. C# has not been publicly released yet. One is written by Sun Microsystems, one my Microsoft. They are fairly similar languages with C# having a few extra bits added on to it.
--
Phil
C# bytecodes can be compiled to native exe files just as Java bytecodes can be. But C# is expected to be more closely tied to the Windows operating system and standard interfaces that are part and parcel of Windows. Writing a native compiler that collects all these interfaces and combines them into a unified whole that can run on ANY operating system may require compiling proprietary windows components which Microsoft will make sure is hard to do and against its licensing policies. So you can expect to see native compilers that compile for Windows platforms but
not to other operating systems.
--
alankarmisra

Q: I read PHP 4 times faster than JSP. Why then do we need JSP?

Answer: These tools fill somewhat different niches and seldom directly compete.

PHP is good for situations where your page can interact more or less directly with a database, without the need for complex business logic. Its strength is that it can be used to build pages VERY quickly. And, as you note, they run very quickly as well.

The JSP/Servlet model is more geared toward distributed n-tier applications where there is at least logical, and possibly physical, separation of model, view, and controller functions. It is more complex than PHP, but also more scalable, and well-written Java apps may be a great deal more maintainable because of the separation of logical tiers.

They're both nice tools, and I use both, but I don't think either one is going to kill the other anytime soon.
--
Joe

Q: My question is : is JSP as powerful as servlet?

I heard that JSP will eventually compile into servlet class file.
One thing can be done by servlet, can it be done by JSP too? In terms of http.

Answer: Everything a servlet does can be done in JSP and vice versa. Good programming practice (you will see some articles over the last year in JavaPro) dictates to combine servlets and JSP in any significant web application.
JSP should be mainly HTML (or XML, or WML or whateverML) with little Java inside.
Servlets should be Java with few or not at all lines like this:
out.println("<html>");
out.printlb("<body>");
This creates a more or less clean separation between presentation (JSP) and business logic (servlet).
Java beans also have a role in this. I strongly recommend the JavaPro articles or whatever text on the MVC model you can find.
--
eugene aresteanu

Q: Doesn't Java have C's preprocessor functions? At least #define's? If not, the only way to define constants is with ‘final’? So... no macros at all??

Isn't there, then, a separate "preprocessor" utility (at least), if I want to define things like
#define proc public void
or so?

Answer: The answer to that is either "No" or "No, thank God". Code gets read many, many more times than it gets written. You should be constantly making things easy for the developers that have to maintain this after you've finished it (after all, it's probably going to be you).
That's way Sun pushes its Java coding standards so hard.
Believe it or not, the only reason that I don't do much C++ work boils down to three things that C++ has that makes its code hideous- the preprocessor, typedef, and operator overloading. All three of those are wholly unnecessary and mung C++ code six ways to Sunday.

When C# was announced, I was excited because I'd heard its preprocessor was more restrictive. It is, in that it doesn't permit macros. It still lets you do all sorts of whacky "conditional compiling" stuff, though, that makes code unreadable again.
--

Cuplan

Q: I can't manipulate inodes on my linux box ... in fact I can't even get real info about a file! Java is a bad hack and is for kids who aren't sharp enough to do C++.

Answer: Think of Java in the same terms as COBOL and VB, and you've got the right idea. Start thinking of it as a replacement for C++ and you're on the wrong track.
Don't expect this portable language to be a tool for low-level coding with hooks into the OS and hardware internals. It just wasn't designed for that. It's an excellent *applications* language, not a *systems* language like C or assembler.

On the other hand, if any pesky Java programmers tell you that C++ is dead and that Java can do everything C++ does, and more, you may howl with laugher and tell them to eat their JVM.
--
David Ehrens

Q: How do we exchange data between Java and JavaScript and vice-versa?

Answer: Public variable and methods of Java Applet are visible to a HTML document. So using JavaScript you can access the public variables and public functions.

The syntax is:

var some_var = document.appletname.variable_name

With this you will get the value of the variable variable_name in your JavaScript variable some_var.

Q: Constructors and methods: are they the same?

I need a little help here...I have been teaching that constructors are not methods. This is for several reasons, but mainly because JLS says "constructors are not members" and members are "classes, interfaces, fields, and methods."
So, now the rest of the staff is ganging up on me and making life a little nasty. They quote Deitel and Deitel, and Core Java (which references "constructor methods") and who knows how many other books.
The one we are teaching in is loaded with so many errors that even though it calls constructors methods NOBODY will quote it as an authority.
How can so many people call constructors methods if they aren't.

Okay. Are they or aren't they? I holding to the definition that they are not unless it is so common to call them that, that I will have to change.
Comments?

Answer: If you go by the JLS (Java Language Specification) and the Java API (and you should) , then no, constructors are not methods. Consider that Class.getMethods() returns an array of Method instances and Class.getConstructors() returns an array of Constructor instances, and Constructor and Method or not interchangeable (one is not derived from the other), but both implement the Member interface. Seems to me that Java is going out of its way to differentiate them.

Besides, the mechanics of constructors are so different from the mechanics of methods, there seems to be no value to considering one a member of the set of the other.
Now, as far as teaching the language goes:

Methods:
+ return types
+ called by name
+ executed multiple times

Constructors:
+ super(...) or this(...) as first instructor (often implicit)
- everything else

I very much do not like trying to lump the two concepts together, especially in introductory courses. Conceptually they are very, very different things.
A constructor is a unique element (even if there are several). It has the name of the class, its declaration is different, and it doesn't have the same syntax as a method. It plays a unique role. You can call a method from a constructor, but you cannot call a constructor from a method.

I say constructors are distinct from methods, and for students, blurring the distinction will lead to problems.
--

by Chuck McCorvey, Chris Wolfe,

-- Paul Lutus, www.arachnoid.com

Q: I the see method getClass() in java.lang.Object. Do we need it? I know all my classes.

Answer: Exactly. If you know - you do not need it. But if you do not know then it helps you. For example if you get some object and would like to instantiate it:

```
Object createNewInstOf(Object obj) {
  return obj.getClass().newInstance();
}
--
Igor
```

Q:I know that a default constructor is being defined from line 6 to 9 (see below). But I don't quite understand the syntax: this(blah, blah). Surely I know that "this" refers to the current object. But what on earth does "this(blah, blah, blah)" mean? Would you please help explain in what kind of situation we need to use this kind of statement?

```
1. public class ThreadPool implements Runnable
2. { private final int DEFAULT_MINIMUM_SIZE=5;
3. private final int DEFAULT_MAXIMUM_SIZE=10;
4. private final int DEFAULT_RELEASE_DELAY=10*1000;
5. ...
6. public ThreadPool()
7. { this(DEFAULT_MINIMUM_SIZE, DEFAULT_MAXIMUM_SIZE,
8. DEFAULT_RELEASE_DELAY);
9. }
10. ......
11. }
```

Answer: Whenever you encounter the :

this(blah, blah)

syntax, it means that another constructor should be called first:

```
public class MyClass{
   MyClass(){
      this(2,2); / / here you make a call to the other constructor
   }

   MyClass(int a, int b){
   }
}
```

The point herecan be, that even if the user doesn't know which parameters to pass to MyClass(int, int) , she gets a default constructor which indirectly gives default parameters.

Important notes :

-calling this(...) is very similar to calling super(...) .
-indeed, this(..) may only be used inside a constructor, and may only be placed as the first instruction in a constructor (all like super(...)).

note that super(...) will call some constructor from the parent class.
--
Arnaud.

Q: Simple question: why constructor doesn't work in following example?

```
class Start {
  public void Start() {
    System.out.println("Konstruktor START");
  }
}

public class Test {
  public static void main(String[] args) {
    Start s = new Start();
  }
}
```

Answer: Because you have included the return-type 'void' in the method declaration, it becomes a normal method, that just happens to have the same name as the class - so it won't get used as a constructor. Remove the 'void' and it should work.
--
Vince Bowdren

P.S. by John: If you do not specifically define any constructors, the compiler inserts an invisible zero parameter constructor "behind the scenes". Often this is of only theoretical importance, but the important qualification is that you only get a default zero parameter constructor if you do not create any of your own.
Your program used this zero parameter constructor and you saw nothing...

Q: Why we can not declare constructor as final?

Answer: The keyword final when dealing with methods means the method cannot be overridden.
Because constructors are never inherited and so will never have the opportunity to be overridden, final would have no meaning to a constructor.

Q: In Java, does exist a function like sprintf in C?

Answer: http://www.efd.lth.se/~d93hb/java/printf/index.html a free Java version of fprintf(), printf() and sprintf() - hb.format package

Q: If I declare an array of an objects, say Dogs, is that memory taken when I create the array or when I create the objects in the array when I declare this array:

Dog[] dog = new Dog[100];

or does it take the memory when I actually create the Dogs in the array eg:

for(int i = 0;i<dog.length;i++)dog[i] = new Dog();

Answer: The statement above is actually two-fold. It is the declaration and initialization of the array. Dog[] dog is the declaration, and all this does is declare a variable of type Dog[], currently pointing to null.
You then initialize the array with new Dog[100], which will create 100 elements in the array, all of them referencing null.
It is important to realize that the elements of an array are not actually objects, they only reference objects which exist elsewhere in memory. When you actually create the Dog objects with new Dog(), these objects are created somewhere in memory and the elements in the array now point to these objects.
Pedant point:
Nothing ever points to null. It is a constant that represents the value of a reference variable that is not a pointer to some object new Dog[100] creates an array of 100 null Dog references.

Q: How do I return more than one value using the return command?

Answer: You could make a new object/class that contains these two values and return it. For example:
Define an object like this:

```
class MyObj {
   public int myInt;
   public double myDouble;
}
```

Then, in your method create one of these, set the corresponding values, and return it.

```
MyObj yourMethod() {
   MyObj obj = new MyObj()
   obj.myInt = 20;
   obj.myDouble = 1.0003
   return obj;
}
```

Q: How do I use object serialization for an object that has other objects as data member? Do both the class need to implement serialize?
How about static data?

```
class A{
}
class B{
   public A a;
}
```

Answer: Both the object and all the object references it contains need to belong to classes that implement Serializable. Static and transient fields are not serialized. For more, see,
http://java.sun.com/docs/books/tutorial/essential/io/serialization.html

Q: I recently learned a bit about "inner classes" but this seems to be different...

I'm a bit new to Java programming so bear with me. My employer bought a package of java graphics library programs to support some chart applets we want to create. We have the source code. I'm trying to create a jar file with all the files I need to run the applet. When I currently run the applet, the browser java tool says that it can't find "TextComponent$1.class".
I recently learned a bit about "inner classes" but this seems to be different. The "TextComponent.java" file does contain some inner classes, but not a class called "1". I'm confused.
Is this an inner class? Or is it something else. Any help would be appreciated. Thanks...

Answer: The TextComponent$1.class is the first anonymous class defined in TextComponent.java. Since nested (inner) classes are compiled to their own .class file, they needed unique names. The javac compiler is just creating a unique file name for an anonymous nested class.

What is the essential difference between an abstract class and an interface? What dictates the choice of one over the other?

Answer: You can only extend one class (abstract or not) whereas you can always implement one or more interfaces. Interfaces are Java's way to support multiple inheritance.

Q: Is there a way to provide values for a Vector in the source code, analogous to array initializers?

Answer: The Vector class constuctors take no arguments other than Collection (since JDK 1.2), which is abstract, and since a Vector is a structure whose size can change dynamically, it's contents can only be initialaized through member methods.
--
Mike Lundy

Q: Is there a collection object like the hashmap or hashtable that stores values in an ordered path? Vector does this but i need the key/value functionality. hashmaps do not guarantee the order of the objects.

Answer: Take a look at java.util.TreeMap.
Red-Black tree based implementation of the SortedMap interface. This class guarantees that the map will be in ascending key order, sorted according to the natural order for the key's class (see Comparable), or by the comparator provided at creation time, depending on which constructor is used.

Note that this implementation is not synchronized. If multiple threads access a map concurrently, and at least one of the threads modifies the map structurally, it must be synchronized externally.

Q: Most people asked why there is an error, but my question is why this is NOT an error...

Please take a look:

r is a number and s is a character, why can I put them together to make a comparison without compilation error? Could somebody tell me... thank you

```
double r = 34.5;
char s = 'c';
if (r > s) {
   System.out.println("r > s");
} else {
   System.out.println("r < s");
}
```

Answer 2: Yes, char is indeed a 16-bit value. However, the actual answer is in the Java Language Specification, section 5.6.2, which is at the following URL:
http://java.sun.com/docs/books/jls/second_edition/html/conversions.doc.html#170983

In summary, the char is automagically promoted to a double. No explicit cast is necessary since the language rules say that it gets "promoted" to a double
by John O'Conner

Q: How can I find the first dimension length of the 2-dimenstions array? I have use the array[].length but it does not work, how can I solve this problem?

Answer: Java doesn't really have "multidimensional arrays", only arrays of arrays. So try: array[0].length and you will get this dimension.

Q: I guess what I'm asking is "Is java.util.Hashtable thread safe?"

It's been a while since I've used hashtables for anything significant, but I seem to recall the get() and put() methods being synchronized.
The JavaDocs don't reflect this. They simply say that the class Hashtable is synchronized. What can I assume? If several threads access the hashtable at the same time (assuming they are not modifying the same entry), the operations will succeed, right? I guess what I'm asking is "Is java.util.Hashtable thread safe?"

Answer: That is right! It is recommendable, if you have questions like these, always look at source for the API, it's freely available.

Q: I was just wondering about the usefulness of Interfaces...

I was just wondering about the usefulness of Interfaces. I was under the impression that interfaces could be used to perform multiple inheritance. But an interface only declares a method - in a very abstract way.

A class that implements an interface needs to define its own implementation of a certain method. What is the use of having an interface when nothing is being gained...?

Answer: If two classes implements the same interface, you can get a reference to the interface instead of the effective class without bother what class are you managing.

This is very useful in RMI (for example) or in any condition when you have to take an object without knowing exactly his class, but only the interface that it implement.

For example:
public void recurseList(List l)

the generic List ensure that you can use every List for this method (ArrayList, AbstractList, Vector...), so your calling method can be:

ArrayList l = new ArrayList(); or
Vector l = new Vector();

recurseList(l);

Without any problem.

by Davide Bianchi

Q: What is better to use: array or vector?

Just wondering as I am using Vectors to store large amounts of objects from 50 to 4000 and each one has to be "looked at" every time paint is called...

Just wondering if it would be better to use an array, list etc?

Answer 1: Since the Vector method uses an array for storage but has extra steps involved in getting an element, use an array for fastest access.
--
WBB Java Cert mock exams http://www.lanw.com/java/javacert/

Answer 2: arrays are faster, vectors are more dynamic.
This should be evident just looking at the amount of code you need to traverse one versus the other. It might also be beneficial to write a linkedlist class and use that. That way you have a dynamic container which has potential to be faster than a vector (though still not as fast as an array). The problem with arrays is that if you need more space than the current size, you have to hardcode their copying into a bigger array.
Conversely, if you never (or rarely) use the entire array, its a waste of space and memory.

The following are benchmark test results of vector vs. array (ran on a 200-Mhz Pentium w/ 96 Mbytes of memory and Windows95):

Allocating vector elements: 17910 milliseconds
Allocating array elements: 4220 milliseconds
Accessing Vector elements: 18130 milliseconds
Accessing array elements: 10110 milliseconds

One other reason for vectors being slower that I did not mention above is that vector methods are synchronized, which creates a performance bottleneck.

Hope this helps
--
MSW

Q: Would anyone know the performance issues regarding Vector's?

I am actually talking about resource pooling. I have objects that wait in a queue. It is a vector that keeps growing, as the queue gets bigger.

Do Vectors have much performance hit? Is there a better way to implement vectors to get the best out of them? Or am I better of

creating a fixed size array?

Answer 1:
If you just want a LIFO or LILO queue, you may be better off with
LinkedList than with Vector, as then you'll never have to wait for the contents to be copied.

Vectors perform pretty well, but if you know (even roughly) how big you're going to need it to be, specifying that in the constructor call can help.

How sure are you that this will be a performance bottleneck? Premature optimisation is the root of all evil...

The Vector class is thread-safe. By that I mean that there is no way to corrupt the internal representation of the data by accessing the vector from more than one thread. However, it is still possible, very easy in fact, to use a vector in a way that is not thread safe.

Consider this code:

```
for (int i = 0; i < vector.size(); i++) {
System.out.println(vector.elementAt(i));
}
```

It looks safe, but there's a subtle flaw...

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General Java Questions - II

Q: I know that Java file should have the same name as public class in the file.. But what are rules for files that have no public classes?

Answer: No rules are defined for such case! It is up to you how to name it. Please check my example:

```
// ****** ABCDEFG.java file ******************
class G {
  public static void main(String[] args) {
    System.out.println("This is class G!");
  }
}
class Z {
  public static void main(String[] args) {
    System.out.println("This is another class Z!");
  }
}
class AB {}
class CD {}
class EF {}
```

After compilation you will get AB, CD, EF, G and Z classes.
You can run G and Z (they have main method), but not AB, CD, EF.
Try it:
java G
or

java Z
--
AP (JA)

Q: I mainly use C++ but I have a program to write and java seems to be the right tool for this job. That said my java skills are a bit rusty. I downloaded a free IDE and am ready to go but I'm not a fan of putting my method implementations in the class definition.

Is there a way to separate the implementation from the class definition?
Like in c++ there are .h files and .cpp files.

Answer: You can use an interface and an implementation class, if you like.
The interface has just the method signatures; the class has their implementations. You can then declare variables having the type of the interface, and assign objects of the implementation class created with "new", or by a factory method.

Java is very different from C++ in that the interface of a class is defined by a compiled view of that class, not by textual inclusion of source for a separate interface description. Therefore the concept of splitting interface from implementation does have the same meaning in Java as in C++.

In Java, you can separate the description of pure interfaces (or abstract classes) from concrete classes that implement (or complete) them. This is a useful technique - compare java.util.Collection and java.util.List to java.util.ArrayList and java.util.LinkedList.
Also, it is traditional to define the return type from factory methods and other such producers to be pure interfaces to allow the factory or other class to decide which implementation to give you - this is used extensively in java.net and java.sql packages.
--
Phil Hanna (Author of JSP: The Complete Reference
http://www.philhanna.com), Chuck

Q: Constructors are similar to methods... I know that they do not return any value. Could I say that they have void type (no return type)?

Answer: Not. Constructors are not methods and they are different because they:
* always have the same name as the class name
* have no return type, even void!
* are not inherited and that's why (by the way) you can declare them final.
--
AP (JA)

Q: Simple question: why constructor doesn't work in following example?

```
class Start {
  public void Start() {
    System.out.println("Konstruktor START");
```

```
  }
}

public class Test {
  public static void main(String[] args) {
    Start s = new Start();
  }
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```

Answer: Because you have included the return-type 'void' in the method declaration, it becomes a normal method, that just happens to have the same name as the class - so it won't get used as a constructor. Remove the 'void' and it should work.
--
Vince Bowdren

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```
Dog[] dog = new Dog[100];
```

or does it take the memory when I actually create the Dogs in the array eg:

```
for(int i = 0;i<dog.length;i++)dog[i] = new Dog();
```

Answer: The statement above is actually two-fold. It is the declaration and initialisation of the array. Dog[] dog is the declaration, and all this does is declare a variable of type Dog[], currently pointing to null.
You then initialise the array with new Dog[100], which will create 100 elements in the array, all of them referencing null.
It is important to realise that the elements of an array are not actually objects, they only reference objects which exist elsewhere in memory. When you actually create the Dog objects with new Dog(), these objects are created somewhere in memory and the elements in the array now point to these objects.
Pedant point:
Nothing ever points to null. It is a constant that represents the value of a reference variable that is not a pointer to some object new Dog[100] creates an array of 100 null Dog references.

Q: Hi there, does anybody know a good source of design patterns written in Java?

Answer: A pretty good (free to download) book.

http://www.patterndepot.com/put/8/JavaPatterns.htm

Q: Whats the difference between the two: System.err. and System.out? When should we use System.err?

Answer 1: System.out leads the output to the standard output stream (normally mapped to your console screen), System.err leads the output to the standard error stream (by default the console, too). the standard output should be used for regular program output, the standard error for errormessages. If you start your console program regularly both message types will appear on your screen.

But you may redirect both streams to different destinations (e.g. files), e.g. if you want to create an error log file where you don't want to be the regualr output in.

On an UNIX you may redirect the output as follows:

java yourprog.class >output.log 2>error.log

this causes your regular output (using System.out) to be stored in output.log and your error messages (using System.err) to be stored in error.log

Answer 2: System.err is a "special" pipe that usually is directed to the standard consolle. You can redirect the System.out with the normal pipe control (| or >), but System.err no. If you want to put both the "normal" output and the "error" output to a file you must use the special redirect 2>.

This allow you to send normal messages into a file or in the /null black hole, but still receive the error messages on the console.

Q: Does anyone know how could I get the size of an Enumeration object? The API for Enumeration only contains getNext() and next().

Answer 1: You can't. Theoretically, some classes that implement Enumeration may also provide some way to get a size, but you'd have to know about the more specific run-time type and cast to it... and none of the standard java.util Collections classes nor Vector or such provide these methods in their Enumeration implementations.

Answer 2:

you can make your own class like this:

```
import java.util.*;

public class MyEnumeration{
  int size;
  int index = 0;
  Enumeration e;

  public MyEnumeration(Vector v){
    size = v.size();
```

```
    e = v.elements();
    index = 0;
  }

  public boolean hasMoreElements(){
    return e.hasMoreElements();
  }

  public Object nextElement(){
    index++;
    return e.nextElement();
  }

  public int size(){
    return size;
  }

  public int getIndex(){
    return index;
  }
}
```

--
by Nicolas Delbing and Victor Vishnyakov

Q: Ok, I know that one cannot put primitive types into a hashmap (only objects or references to them) and I know how to deal with that (write some kind of wrapper class).

What I'm interested in is: 'Why is that?' Why can I not put a primitive type into a hashmap? Something to do with this 'heap' thing... Right?

Answer: HashMap requires a key or a value to be assignment- compatible with java.lang.Object (i.e. to be an object or an array). Primitive types aren't ones.
You can use wrappers like java.lang.Integer for this purpose. All container classes require some basic operations to be defined for all of its contained objects in order for it to organize the data.

For example, a hashmap requires a hashing method hashCode(). A primitive type doesn't have any methods associated with it.
The distinction between primitive types (int) and their wrapper classes (Integer) is made purely for optimisation purposes. For example, we wouldn't want to have to instantiate actual objects in an array instead of just allocating a block of memory for an array of integers.
--
Gary

Q: Most people asked why there is an error, but my question is why this is NOT an error

Please take a look:

r is a number and s is a character, why can I put them together to make a comparison without compilation error? Could somebody tell me... thank you

```
double r = 34.5;
char s = 'c';
if (r > s) {
   System.out.println("r > s");
} else {
   System.out.println("r < s");
}
```

Answer 1: Yes, char is indeed a 16-bit value. However, the actual answer is in the Java Language Specification, section 5.6.2, which is at the following URL: http://java.sun.com/docs/books/jls/second_edition/html/conversions.doc.html#170983

In summary, the char is automagically promoted to a double. No explicit cast is necessary since the language rules say that it gets "promoted" to a double.
--
by John O'Conner

Q: == and equals ()... These two still make me confuse a lot of time.

Can somebody give me some thumb rule or explain it to me?

Answer: When you use == with a primitive -int, double, char, ... you are checking that the values are identical. But if you use == with an object, you are checking that the 2 objects are stored at the same address. In other words the references pointing to the same object...

Method equals () is different.

It is the same as ==, if it isn't overriden by the object class.

Many classes override the method equals (). In this case this method will check that content of the object is the same or not, not addresses.

Q: What is difference between Iterator and Enumeration?

First of all Java FAQ Team wish you !!!HAPPY NEW YEAR!!! and then

Answer: from http://java.sun.com/docs/books/tutorial/collections/interfaces/collection.html

The object returned by the iterator method deserves special mention. It is an Iterator, which is very similar to an Enumeration, but differs in two respects:
Iterator allows the caller to remove elements from the underlying collection during the iteration with well-defined semantics.
Method names have been improved.

The first point is important: There was no safe way to remove elements from a collection while traversing it with an Enumeration. The semantics of this operation were ill-defined, and differed from implementation to implementation.
The Iterator interface is shown below:

```
public interface Iterator {
  boolean hasNext();
  Object next();
  void remove(); // Optional
}
```

The hasNext method is identical in function to Enumeration.hasMoreElements, and the next method is identical in function to Enumeration.nextElement. The remove method removes from the underlying Collection the last element that was returned by next. The remove method may be called only once per call to next, and throws an exception if this condition is violated. Note that Iterator.remove is the only safe way to modify a collection during iteration; the behavior is unspecified if the underlying collection is modified in any other way while the iteration is in progress.
The following snippet shows you how to use an Iterator to filter a Collection, that is, to traverse the collection, removing every element that does not satisfy some condition:

```
static void filter(Collection c) {
  for (Iterator i = c.iterator(); i.hasNext(); )
     if (!cond(i.next()))
     i.remove();
}
```

Two things should be kept in mind when looking at this simple piece of code:
The code is polymorphic: it works for any Collection that supports element removal, regardless of implementation. That's how easy it is to write a polymorphic algorithm under the collections framework!
It would have been impossible to write this using Enumeration instead of Iterator, because there's no safe way to remove an element from a collection while traversing it with an Enumeration.

Q: I try to copy an object of my own using the clone() method from java.lang.Object, but this is a protected method so I can't use it. Is there some other way to get my objective of duplicating an arbitrary object?

Answer: If you want to clone your object, you need to make it cloneable. To achieve this, you need to do two things:

1. implement the interface Cloneable

2. override the method clone(), so that it
a. becomes public
b. calls super.clone()
c. if necessary, clones any members, or

d. if a member can't be cloned, creates a new instance.

Simple example:

```
public MyClass implements Cloneable {
  int someNumber;
  String someString;

  public Object clone() {
  // primitives and Strings are no
  // problem
    return super.clone();
 }
}
```

In this case the method clone() of the class MyClass returns a new instance of MyClass, where all members have exactly the same value. That means, the object reference 'someString' points to the same object. This is called a shallow copy. In many cases this is no problem. Strings are immutable and you do not need a new copy. But if you need new copies of members, you have to do it in the clone() method. Here is another simple example:

```
public class SomeMember implements Cloneable {
  long someLong;

  public Object clone() {
    return super.clone();
  }
}

public AnotherClass extends MyClass {
   SomeMember someMember;

   public Object clone() {
      AnotherClass ac = (AnotherClass)(super.clone());
      if (someMember != null) {
         ac.someMember = (SomeMember)(someMember.clone());
      }
      return ac;
   }
}
```

Note that the class AnotherClass, that extends MyClass, automatically becomes Cloneable, because MyClass is Cloneable.

Also note, that super.clone() always returns an Object of the type of the actual object, although the superclass doesn't know anything about that sub class. The reason is, that Object.clone() is a native method, which just allocates new memory for the new object and copies the bytes to that memory. Native code has it's own ways of finding out which type to return ;-)
--

Karl Schmidt

Q: I was just wondering about the usefulness of Interfaces...

I was just wondering about the usefulness of Interfaces. I was under the impression that interfaces could be used to perform multiple inheritance. But an interface only declares a method - in a very abstract way.

A class that implements an interface needs to define its own implementation of a certain method. What is the use of having an interface when nothing is being gained...?

Answer: If two classes implements the same interface, you can get a reference to the interface instead of the effective class without bother what class are you managing.

This is very useful in RMI (for example) or in any condition when you have to take an object without knowing exactly his class, but only the interface that it implement.

For example:
public void recurseList(List l)

the generic List ensure that you can use every List for this method (ArrayList, AbstractList, Vector...), so your calling method can be:

ArrayList l = new ArrayList(); or
Vector l = new Vector();

recurseList(l);

Without any problem.

by Davide Bianchi

Q: I got a problem with an array/vector...

I got a problem with an array/vector.

my class contains a member:
static Vector quad[][];
....

in my constructor I got:
```
Vector quad[][] = new Vector[row][col];
for (int i = 0; i < row; i++){
   for (int j = 0; j < col; j++){
      quad[i][j] = new Vector (0,1);
   }
}
```

// row and col are int between (10..50) -- it's a big I know, but that

might not be the problem

My PROBLEM (and I don't know what to do, really), I can't access quad[x][y] outside of the constructor!!!! Within the constructor I've got full access on quad[x][x]. Java (1.2) returns a NullPointerException on any method except within the constructor!!!

What's my fault!???

Answer: I guess you shouldn't write Vector here:
Vector quad[][] = new Vector[row][col];
so, the correct variant may be:
quad[][] = new Vector[row][col];

I guess You just overridden your static variable with one defined in your constructor:
Vector quad[][].
Thus, you're initializing NOT your class-scope static variable but your constructor-scope quad.
It's not reachable outside the constructor. And as for static quad, it has never been initialized!
And a first reference to it causes NullPointerException. I guess. I hope I'm right :)
--
Xao Rom

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General Java Questions - III

Q: I propose that Java should allow multiple inheritance if...

Everyone knows the potential problem with multiple inheritance is when you run into the problem of having two instances of a grand parent super class.

For example:
class A extends D {int i; }
class B extends D {int i; }
class C extends A,B {}

Potentially, you could have two copies of D for each instance of C.

However, I propose that Java should allow multiple inheritance if there are no instance variables associated with the abstracts that the base class is extending.

abstract class A { public setX(); public setY(); public setAll() {setX (); setY(); }
abstract class B { public setC(); public setD(); public setBoth()
{setC(); setD(); }

class C extends A,B {}

You won't have two instances of some grandfather class, since A and B doesn't have instances variables.

I hope the next versions of Java explores this issue.

Answer: It does. They're called interfaces:

```
interface A { public void setX(); public void setY(); public void setAll(); }
interface B { public void setC(); public void setD(); public void setBoth(); }

interface C extends A,B {};

public abstract class D implements C {
}
```

--
jim

Q: Can I access a private variable of one Object from another Object?

Answer: Yes, if this object of the same class. You can access private field from static method of the class through an instance of the same class.

Check one example below:

```
public class Example {
  private int privateVar;
  Example(int a) {
    privateVar = a;
    System.out.println("private privateVar = " + privateVar);
  }

  public static void main(String[] args) {
    Example ex = new Example(5);
    System.out.println(ex.privateVar);
  }
}
```

--
AP (JA)

Q: Is there a way to know from class X which class called the method foo()?

If class A and class B are calling a method foo() on class X, is there a way to know from class X which class called the method foo() (they can be either A or B). I know that this can be done by capturing the stack trace and examining it, but that solution looks expensive as I have to create a new Throwable object every time and capture stack trace (And I do this quite frequently).

Is there any other elegant solution to do this, any help and direction
is appreciated.

Answer: Pass a reference to the class to the foo() method.

```
foo(Object x){
```

```
    System.out.println(x.getClass());
}
```

should do it.

Q: Is it possible to stop an object from being created during construction?

For example if an error occurs inside the constructor (e.g. the parameters pass in were invalid) and I wanted to stop an object being created would it be possible to return null rather than a reference to a new object. (I know the term return is technically correct in this case but you know what I mean).
Basically, is it possible to cancel object creation?

Answer: Yes, have the constructor throw an exception. Formally, an object _will_ be created (since the constructor is a method invoked after the actual method creation), but nothing useful will be returned to the program, and the dead object will be later reclaimed by Garbage Collector.

But the clean way is as another reply suggests, that you leave calls to the constructor to a static factory method which can check the parameters and return null when needed.

Note that a constructor - or any method in general - throwing an exception will not "return null", but will leave the "assign target" as it was.
Tor Iver Wilhelmsen

Q: suppose I put a file a.txt in package com.xyz and the try access it like following. Will it work?

```
import com.xyz.*;
public class Hello{
  File f = new File("a.txt");
  ...
}
```

it is not working for me. Is there any workaround?

Answer: If the source and the text file are in the jar file, then you access the file by:

```
URL fileURL = getClass().getResource("file.txt");
```

You can then read the file by using a reader (or whatever you choose),
e.g.:

```
_istream = new BufferedReader( new
InputStreamReader(fileURL.openStream()) );
```

--

j o h n e w e b e r

Or, simpler
getClass().getResourcesAsStream("file.txt"), but you must be sure that
file is in the same directory (package) as your class, otherwise you
need play with getClassLoader().getResourceAsStream(<path>"/file.txt");
--
Oleg

Q: Difference between loading and instantiating a class???

Well, the subject says it all. What is the difference between loading and instantiating a class in a JVM.

Second question: What would happen if at runtime I update a class file? Will the JVM know to use that instead?

Answer: The difference is that when a class is loaded by a ClassLoader it is read in as a stream of bytes, presumably from a file, but it could just as easily be from over the network, and then processed or "cooked" into a representation that the VM can use to make instances of Objects of that classes type. This last part is the instantiation. You can load a class at runtime with:

Class.forName("MyClass");

and instantiate one with:

MyClass mc = Class.forName("MyClass").newInstance();

Cool, ehh. You don't have to know the name of a class at compile time.

>Second question: What would happen if at runtime I update a class file?
>Will the JVM know to use that instead?

Loaded classes are cached because it's quite costly to do the "cooking" I mentioned above. So it will not be loaded. You may create a separate ClassLoader with new SecureClassLoader but that will cause all classes _it_ loads to be loaded from this new ClassLoader but that's not what you want.

I don't know if you can specify that a class should be loaded from disk again using the normal ClassLoader. You could very easily make your own ClassLoader in which case you would have explicit control over such things. Look at java.lang.ClassLoader and java.lang.Class.
--
Michael B. Allen

Q: Why developers should not write programs that call 'sun' packages?

Answer: Java Software supports into the future only classes in java.* packages, not sun.* packages. In general, API in sun.* is subject to change at any time without notice.
A Java program that directly calls into sun.* packages is not guaranteed to work on all Java-compatible platforms. In fact, such a program is not guaranteed to work even in future versions on the same platform.

For these reasons, there is no documentation available for the sun.* classes. Platform-independence is one of the great advantages of developing in the Java programming language. Furthermore, Sun and our licensees of Java technology are committed to maintaining backward compatibility of the APIs for future versions of the Java platform. (Except for code that relies on serious bugs that we later fix.) This means that once your program is written, the class files will work in future releases.

For more details, see the article Why Developers Should Not Write Programs That Call 'sun' Packages.
http://java.sun.com/products/jdk/faq/faq-sun-packages.html

Q: Can garbage collector remove my singleton?

A usually singleton..

```
public class Single{
   private static Single single;
   private Single {}
   public static Single getInstance(){
      if(single==null){
         single = new Single();
      }
      return single;
  }
}
```

Well,, seems good ?
But classes are objects too...so do Java 2 v1.3 class garbagecollecting? Meaning my singleton could dissapear if i dont keep a refrence to it (or the class itself) somewhere ?

If classes is not garbagecollected, that's pretty stupid, I dont want classes taking up memory when i perhaps never will use it again....

Answer: No. Classes can define objects. That is, only the dynamic part of the class defines objects. The static part exists only in one place in memory and can not be duplicated. You can call the getInstance() method from anywhere in your program.
Java requires however that you tell where to find the method, in this case in the Single class. Therefore, you should use

Single.getInstance()

to get the instance. This is (though it looks much like it) not an execution of a method on an object, but just a method call without object. Single is only used to find out which getInstance() method should be used, and where it is.

You could add a delete() method if you don't need the instance anymore:

```
public class Single{
  private static Single single;
  private Single {}
  public static Single getInstance(){
    if(single==null)
       single = new Single();
    return single;
   }

  public static delete(){
    single = null;
  }
}
```

The garbage collector can now remove the single object after delete() is called if memory is needed.
--
Rijk-Jan van Haaften
Dept of Computer Science, Utrecht University, The Netherlands

P.S by John:
Doing more deeper investigation of this question I found one very good article about this topic. Everybody who are interested can read full article here:
http://developer.java.sun.com/developer/technicalArticles/Programming/singletons/

For the rest of our audience shortly:
A Singleton class can be garbage collected and when
".. a Singleton class is garbage-collected and then reloaded, a new Singleton instance is created. Any class can be garbage-collected when no other object holds reference to the class or its instances. If no object holds a reference to the ' Singleton object, then the Singleton class may disappear, later to be reloaded when the Singleton is again needed. In that case, a new Singleton object will be created. Any static or instance
fields saved for the object will be lost and reinitialized.

This problems exists in older JavaTM Virtual Machines1. JDK 1.2 VMs, in particular, conform to a newer class garbage collection model that forbids any class in a given classloader to be collected until all are unreferenced"

And you "... can also set your VM to have no class garbage collection (-Xnoclassgc on the JRE 1.3, or -noclassgc on the IBM JVM). Keep in mind that if you have a long-running program that frequently reloads classes (perhaps through special class
loaders such as the remote class loaders), you have to consider whether that could cause a

problematic buildup of garbage classes in the VM."

Also some people asked what is a Singleton and what is relation has it to Java.
Shortly a Singleton is one of classical design patterns that are used in software development.
More please read in free book here:
http://www.patterndepot.com/put/8/JavaPatterns.htm

Q: I study patterns now and would be lost and forget everything very soon! Help!

I am very new to design patterns and just bought the GoF book to learn about it.
But as I complete the first couple of chapters right away, I see that they have 23 different patterns and I would be lost and forget everything very soon if I sequentially (page by page) read the entire book!.

Do any of you have recommendations on how to proceed with this book so that I 'll remember at least some of them by the time I am done with the book? I can see that many of the classes in java API use composition, facade etc...
But other than that I don't think I 'll be able to gather anything unless I am able to remember where & when to use particular pattern A, B or C...

Answer: Glad to hear you got the GoF book, it's a great reference manual for patterns. As you've found, however, it's a bit heavy to just "read." What I recommend to people is that they pick a few of the easier, more commonly used patterns: Singleton is a no-brainer that pops up a lot. Adapter tends to get used here and there and isn't that difficult to understand. If you're doing Swing, then definitely go learn the Observer pattern. It'll help to keep you from mixing data and interface code. Once you've learned three or four and have used them a few times, then as you start new projects, look back to the text to see if there are opportunities in your project where other patterns can be used.

You'll find that over time you'll use more and more of the patterns (some a lot more than others, obviously). I've often found cases where I missed a pattern during design and had "the light go on" after I'd written a bunch of code and realized I was either using a known pattern by accident, or could have used a pattern to my advantage. When possible, I then go back and adjust the design/code to match the pattern.

Keep in mind that the patterns generally don't appear as "absolute." It's expected that you may have variations to satisfy your application's needs.
It's really helpful to others, however, if you make a quick note in your design doc/code about what pattern you were using (which helps them learn patterns too, and helps them understand what you were up to if they know the pattern already).
--
Rico Trooper

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General Java Questions - IV

Q: I need to programmatically replace an entry in a zip file.

I could not quite get it using the ZipOutputStream because it simply creates a new file and write only that entry for me. The rest of the original entries are gone.
Does anyone have a solution for this?

Answer:

1) Read the file (myfile.properties) out of the original Zip Archive (original.zip)
2) Make your changes, write the file to the file system
3) Create a New Archive (originalNew.zip)
4) Write your edited file (myfile.properties) to originalNew.zip
5) loop through all the entries in the original Zip archive (original.zip), adding them to the new archive (originalNew.zip) EXCEPT for the file you are replacing (myfile.properties)
6) When you're done, erase the original and rename your new one to original.zip.

I believe that this may be the only way to do this, since there doesn't seem to be any random access in the ZIP file.
--
Kevin T. Smith

Q: What is better to use: array or vector?

Just wondering as I am using Vectors to store large amounts of objects from 50 to 4000 and

each one has to be "looked at" every time paint is called...

Just wondering if it would be better to use an array, list etc?

Answer 1: Since the Vector method uses an array for storage but has extra steps involved in getting an element, use an array for fastest access.
--
WBB Java Cert mock exams http://www.lanw.com/java/javacert/

Answer 2: arrays are faster, vectors are more dynamic.
This should be evident just looking at the amount of code you need to traverse one versus the other. It might also be beneficial to write a linkedlist class and use that. That way you have a dynamic container which has potential to be faster than a vector (though still not as fast as an array). The problem with arrays is that if you need more space than the current size, you have to hardcode their copying into a bigger array.
Conversely, if you never (or rarely) use the entire array, its a waste of space and memory.

The following are benchmark test results of vector vs. array (ran on a 200-Mhz Pentium w/ 96 Mbytes of memory and Windows95):

Allocating vector elements: 17910 milliseconds
Allocating array elements: 4220 milliseconds
Accessing Vector elements: 18130 milliseconds
Accessing array elements: 10110 milliseconds

One other reason for vectors being slower that I did not mention above is that vector methods are synchronized, which creates a performance bottleneck.

Hope this helps
--
MSW

Q: Would anyone know the performance issues regarding Vector's?

I am actually talking about resource pooling. I have objects that wait in a queue. It is a vector that keeps growing, as the queue gets bigger.

Do Vectors have much performance hit? Is there a better way to implement vectors to get the best out of them? Or am I better of creating a fixed size array?

Answer 1:
If you just want a LIFO or LILO queue, you may be better off with
LinkedList than with Vector, as then you'll never have to wait for the contents to be copied.

Vectors perform pretty well, but if you know (even roughly) how big you're going to need it to be, specifying that in the constructor call can help.

How sure are you that this will be a performance bottleneck? Premature optimisation is the root

of all evil...

The Vector class is thread-safe. By that I mean that there is no way to corrupt the internal representation of the data by accessing the vector from more than one thread. However, it is still possible, very easy in fact, to use a vector in a way that is not thread safe.

Consider this code:

```
for (int i = 0; i < vector.size(); i++) {
System.out.println(vector.elementAt(i));
}
```

It looks safe, but there's a subtle flaw...

Q: More about Robot! I met with a problem in using class Robot.mousePress...

The compiling process is successful. But when I run it, I receive "IllegalArgumentException: Invalid combination of button flags". I don't quit understand this information. Part of my code is as following:

```
Robot rMouse=new Robot();
int button=1;
rMouse.mousePress(button);
rMouse.mouseRelease(button);
```

I am really confused. Will you please give me some advice? Thank you in advance!

Answer: You are not using a valid value for the argument to the mousePress() and mouseRelease() methods. If you check the API documentation, you'll find the valid values are a combination of one or more of the following constants:

```
InputEvent.BUTTON1_MASK
InputEvent.BUTTON2_MASK
InputEvent.BUTTON3_MASK
```

plus others which represent the Ctrl, Alt, and Shift keys. To press the left mouse button, you want to use:

```
rMouse.mousePress(InputEvent.BUTTON1_MASK);
```

--
Lee Weiner

Q: In what situation an exception has to be caught otherwise the compiler will complain?

e.g. IOException does NOT have to be explicitly caught, however, SQLException has to be caught otherwise VisalAge will not compile the program.

Answer: The only unchecked exceptions in Java are RuntimeException and its subclasses.

This includes such familiar classes as NullPointerException, ClassCastException, and IndexOutOfBoundsException.

IOException is not one of these, and *does* have to be explicitly caught or thrown
--
jeff_robertson

Q: I wrote a program that use a few RS232 ports. The operators are unskilled and often start multiple instances of the program. Will someone please be so kind and tell me how I can prevent them doing it?

Answer 1: The first instance might write a file. Subsequent instances could check for the existence of that file, or else check it's contents.

Another method could involve creating a server socket on a specific port. Subsequent efforts to create a socket on that same port would throw an exception.

Answer 2: Actually a better way is to (on launch):

1) Check if the file exists. If not, create it, open it and run. Leave it open until you quit, upon which time you close it.

2) If the file _does_ exist, try to delete it. If the delete fails, then someone else has it open, which means another copy of your app is running. Inform the user and quit.

3) If you succeeded in deleting it, then you are the first. Now create, open and run.

Doing the above prevents the problem of having the semaphore file left around when the system crashes. I implemented it recently in one of our apps, and it works like a charm.
--
Burt Johnson
MindStorm Productions, Inc.
http://www.mindstorm-inc.com

Q: Can you call a class static abstract method from an abstract class or does it need to be extended and then called from its concrete class?

I've been told that abstract classes do not actually have any code in them cause they are like a placeholder, so I guess you wouldn't bother calling a static method in an abstract class cause it wouldn't have any code to begin with....?

Answer: You have been told wrong. Abstract classes can and do have code in them.
See, for example, java.awt.Component, an abstract class with a lot of code and no abstract methods at all. If a class has any abstract method member, directly declared or inherited, it is required to be declared abstract. If not, it is the programmer's decision and should be based on whether it would make sense to have an instance of that class.

Perhaps whoever told you was confusing abstract classes with interfaces, which don't contain

implementation, only abstract method and constant declarations.

You cannot declare a method to be both static and abstract. Abstract requires the method to be overridden before you can have a concrete class, static prevents overriding. You can have a static method in an abstract class - such a method could be called without creating an instance of the class, the only thing that is prohibited for abstract classes.
And when a subclass of an abstract method has been instantiated, all the methods from the original class will keep the same code in the instance. Most of the time an abstract class will have abstract methods.
However, there are several examples of abstract classes that don't have any abstract methods at all. Some examples are Component and FontMetrics from the AWT. It doesn't make sense to have just a Component that's not a specific type of component. It doesn't make sense to have a FontMetrics that doesn't measure any specific kind of Font.

Also being abstract never prevents overriding, it just requires overriding in order to derive a non-abstract subclass. And if a class is a subclass of an abstract class, it only MUST override those methods declared abstract. The other methods do not require overriding.

Q: I write java about 2 years, but I still confuse one thing that is why should we use interface???

If I need to implement an interface and just use its every methods name.
Why shouldn't just write every methods statments in a class, not in interface??
I only can think about that if I extend a class, than can implement another or the others interface.
As you can saw, I really confuse about this. And I do see many books for the reasons , but I can't get the answer, please tell me !

Answer: "Interface" is the Java way to do multiple inheritance, or a better way to think of it is as a way to design plug-ins.

For example, let's say we have an application that monitors a network of computers. Our monitors might check for web pages, or they may check for other ports, or they may have hooks for hardware checks.

The interface to our main control panel is always the same: We need some means to poll the monitor object for an answer. This is the "NetworkMonitor" interface and all network monitors will share this interface, but they may have a class heirarchy that is very different, for example, port-monitors may all fork a thread that periodically checks whereas our control panel interface just asks for the most recent answer; hardware monitors may ask for their data in real-time or over RPC and thus have no need of inheriting from Thread.

Because they share the same Interface definition, the control panel application does not need to know if they are polling monitors or real-time monitors because, from the control panel's point of view, it does not matter
--
...
P.S. by John

Also interfaces make our life (I mean programmers) much easier.
Imagine a big project (a lot of programmers, many packages, thousands of files): it is impossible all the time to be aware about particular implementation of some method in specific class in another package!
Much easier to define interfaces between packages as some kind of bridges or gates into another package and their functionality, with hidden (for us) implementation. We just know interface and method names. It is enough to use those methods.
How it is implemented there does no matter... It is working!

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http://www.javafaq.nu/plm2html/my_subscription.shtml

General Java Questions - V

Q: I read it on http://java.sun.com/docs/books/tutorial/java/javaOO/override.html:

"Also, a subclass cannot override methods that are declared static in the superclass. In other words, a subclass cannot override a class method. A subclass can HIDE a static method in the superclass by declaring a static method in the subclass with the same signature as the static method in the superclass. "

My question: It looks like play with words: override, hide.. Why is it written HIDE?
If I can write a static method in subclass with the same signature it means that I override that method in superclass, I really changed that method here in subclass. Am I wrong?

Answer: Let's start from the very beginning - definition for overriding. It includes three main points that overridden method must:
* have the same name
* have the same signature
* have the same data type.

In your case the static method in subclass can have another data type.
Example:

********** Alex.java **********
```
package alex;
public class Alex {
```

```
  static String al(String name){
    return name;
  }
}
******************** EOF ***********

************ John.java *************
package alex;
public class John extends Alex {
  static int al(int name){
    return name;
  }
}

******************** EOF ***********
```

It compiles! You see that in Alex class the method "al" returns String and in John class - int.
It is hiding, not overriding.
Advice: try to avoid such situation when you hide methods in super class. Use different names instead and you will save a lot of time.
--
AP (JA)

Q: Why C++ is not platform independent?

Answer: C++ compiles to binary code (.obj, .exe, .dll, a.out etc.). Binary code (Machine code, 0's and 1's) are machine dependent.
Java compiles to byte code which is independent of any machine. It need to be interpreted to binary code by JVM, and executed by the machine

Question: I know that void method does not return any value. But I still write the code like this:

```
void nothing() {};
void nothing2() {return;};
```

Why can we still use "return" in the body of method?

Answer: To be able to exit method when it is necessary.
You can exit the method when you reach the end of method and do not need to use "return".
If due to some condition program must exit the method then you use "return".

Q: I can't find the API documentation on any classes in the sun.* packages. Where is it?
Answer: The short answer is that SUN provides documentation only for the public classes in java.*. SUN does not provide documentation for sun.* because those are the Sun-specific implementation, and specifically not part of the Java technology API standard, and are therefore subject to change without notice.

In general, SUN doesn't provide javadoc documentation for sun.* classes in order to discourage developers from writing programs that use them. For further explanation, see the next question.

However, if you must have it, the documentation for sun.* is available separately, here: http://java.sun.com/communitysource/index.html For example, the doc comments for sun.net are in the source files located at:

/src/share/sun/sun/net/*.java

This source code release does not include javadoc-generated documentation. You would have to generate those docs yourself using javadoc.

source: http://java.sun.com/products/jdk/faq.html#A12

Q: How do I copy one array to another?

Given that I have an byte array defined like this:
byte byteSmall = new byte[23];
and another larger byte array defined like this:
byte byteBig = new byte[30];

How do I copy byteSmall into byteBig starting at index 7 without a for loop like this:

```
for(int i = 0; i < 23; i++){
   byteBig[i + 7] = byteSmall;
}
?
```

Answer: See System.arraycopy:
"Copies an array from the specified source array, beginning at the specified position, to the specified position of the destination array. A subsequence of array components are copied from the source array referenced by src to the destination array referenced by dst. The number of components copied is
equal to the length argument. The components at positions srcOffset through srcOffset+length-1 in the source array are copied into positions dstOffset through dstOffset+length-1, respectively, of the destination array.

If the src and dst arguments refer to the same array object, then the copying is performed as if the components at positions srcOffset through srcOffset+length-1 were first copied to a temporary array with length components and then the contents of the temporary array were copied into positions dstOffset through dstOffset+length-1 of the argument array."

Q: Does the java class that call the JNI need to be in the same directory of the DLL?

I have the java class in a package and in a jar file. The DLL it uses is outside of the jar file. The

JNI call does not work. I am confused with the path.

Answer: As long as the library is in your "path" you should be able to load it with java.lang.System.loadLibrary.

On Linux it should be in your LD_LIBRARY_PATH and on Windows in your PATH.

With java.lang.System.load you can load the library from a predefined location.
--
Flaps

Q: By default an application has no security manager and Java runtime environment does not create automatically a security manager for my program. How then applet where I am not creating any security manager already prevented from many operations?

Answer: It is true - Java by default let you do whatever you want and then it is your responsibility to restrict something. In case with applets a little bit different story - applet viewers and browser have THEIR OWN security manager, not from JRE.
That's why even if you did not define any security manager in the code of your applet, during the start up time browser/viewers will use their own security manager. This manager is built in into their application (browser, viewer), not your Java applet.
--
AP (J.A.)

Q: I am a Java beginner. I just want to ask what's the difference between

```
int [] number;
  and
int number[];
```

Answer: The "postfix []" syntax is to make the language more comfortable with C programmers.
In Java, the "postfix []" binds to the variable name, while the "prefix []" binds to the type name.
In C, there is only the "postfix []". But C also includes pointers, which Java doesn't. The pointers are identified by having a * between the type name and the variable name.
While there is no danger of ambiguity in this declaration:
int a[], b;
there IS danger of ambiguity in this declaration:
int *a, b;
In the latter case, the C rules are that a is declared a pointer, while b is not.
Java offers the following different ways of declaring arrays:
int a[], b; <--> int[] a, b;
These are not equivalent, because b is an array only on the right side.
Whereas with C-style pointers these would become:
int *a, b; <--> int* a, b;
which breaks the concept of "white space doesn't matter", so it will not be as easy to scan and parse.
So the designers of C decided to have only 1 form of defining variables with pointer types or array types, and this was that the * or the [] binds to the variable, not to the type.

Java carried over the variable binding, but also introduced the type binding, because there were no more pointers, so the ambiguity was removed.
--
Joona Palaste
And think also about marketability!
Making Java's syntax highly similar to C and C++'s during its early years:
* Made the language seem more familiar to C/C++ programmers.
* Decreased the learning curve for C/C++ programmers.
* Gained credibility through the frequent inference that it was a next-generation descendant of C++.
* Increased its pool of programmers by attracting C/C++ programmers through the effects above.

This isn't the only instance of anachronistic syntax; consider the optional semicolon at the end of a class declaration.
--
Andrew R.

Q: When do I need to use overloading in a program? And why?

Answer: Overloading is best used when you want to have a function that has the same name but can accept different arguments. The only restriction is that it must return the same type.

e.g.

```
public String aName(String str) {
   String retStr;
   retStr = "Hello" + str;
   return retStr;
}

// Now the same function but overloaded

public String aName(String str, String str2){
   String retStr;
   retStr = "Hello " + str + str2;
   return retStr;
}
```

Both functions return the same type (a String) but have different signatures.

You will find this used a lot with constructors. See any recommended text on Java for a much better explanation.
--
Anthony Miller

Q: Why people claim that java is a secure language...

Answer: The java programming language itself is just as secure or insecure as any other programming language. A Java Applet (which are used on the web) is a different matter. They are quite secure.

An applet does not have access to system resources outside of the directory that it is created in. There are ways that you can give an applet access to this information, but they are pretty explicit and you will most likely know that the applet is trying to do this.
I am not really familiar with the subject but did a little reading on the sun website. Check it out for more info:

http://developer.java.sun.com/developer/technicalArticles/Security/

You aren't supposed to be able to break the rules easily at run time. The elimination of pointer arithmetic is supposed to improve type safety.

The Code Red worm is a good example of the weakness of the 'old-style' languages. This worm uses a 'buffer overflow' attack to 'trick' the IIS program in to doing it's bidding.

The Java system is designed to make it harder to make the programming mistake that Code Red exploits. It is important that you understand that Code Red would not have been possible without careful attention to a fast buck by Mr William Gates III and his cohorts.
--
Dr Hackenbush

Q: Does anyone know if there is a way to prevent System.exit() being called?

Answer: Look into java.lang.SecurityManager. It has a method called checkExit() with which you can prevent System.exit().
This method throws a SecurityException if the calling thread is not allowed to cause the Java Virtual Machine to halt with the specified status code.
--
David Zimmerman

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Java HardWare (not software? are you sure?)

Q: Can anyone please direct me to some literature pertaining to the Java chip.

Is the project still being pursued by Sun? I remember hearing about it in 2000 but haven't heard of any companies adopting the chips. This makes me worry about the chip's cost and availability.

Answer: You can find some companies producing Suns java chip and different ones on the link section of http://www.jopdesign.com.

Sun has had at least two "Java chip" projects that I know of.
PicoJava was the earlier one -- I thought it died quietly, but I see that Fujitsu lists a "32-bit PicoJava-II microcontroller", so maybe not. The more recent one is MAJC, but it isn't aimed at small or low-power devices.

New ones keep coming out of the woodwork, e.g. this announcement yesterday:

http://dailynews.yahoo.com/h/nm/20010604/tc/tech_omron_chip_dc_1.html

If you want to experiment with one that's available now and does real-time Java, see

http://www.jstamp.com/

A fair number of us have also used the TINI board

http://www.ibutton.com/TINI/

though it is aimed at industrial controllers, not PDAs. (It's a conventional CPU running a JVM, not a "Java chip", but that may be a silly distinction).

Imsys makes a Cjip: http://www.imsys.se/

http://www.ptsc.com have had their PSC1000A 32bit 100MHz $10 'Java' chip available for some time. I've been using it (but not with Java) for over a year. It rocks.
They also make a complete module (using a PSC1000A) called Ignite1.
--
Thomas Maslen

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http://www.javafaq.nu/plm2html/my_subscription.shtml

Job, fun, other...

Q: Please clarify my confusion about Java versions. I hear Java 2 but JDK is 1.2
Now we are going to use JDK 1.3 on the job and I said that this is Java 3 and probably soon when JDK 1.4 will be released we will use Java 4.
My chief said me that I am wrong and he never heard about Java 4. He insists on it, but cannot explain why.
Maybe because of he is chief? Please explain...

Answer: He is right and not because of the fact that he is chief :-)
Although exist one old set of rules:
1. Chief is always right!
2. If chief is not right please see line number 1.

I think we have to wait a few years more until Java 3 comes to us.
It is SUN's numbering policy. All JDKs that have numbers 1.2, 1.3, 1.4 are Java 2 JDKs...
Difficult to understand but easy to remember...
--
AP. (J.A.)

Q: Hi, I am learning java and hoping to take the certification test this april. How important is it to gain this certification? And would employers be interested?

Answer:

1. Look at the job ads... do they ask for it?
2. If you are an interviewer with two identical candidates, but one had this. Who would you employ?

Q: ...However I am having a difficult time finding a job.

I have been studying Java since December and passed the SCJP a few weeks ago. However I am having a difficult time finding a job. I have found that most of the positions require a good deal of experience first. Also, even the entry level positions have not responded to my resume.

Two questions:

Any ideas on how I can make it look better?
and even more importantly,
What should I begin learning next?

(There are so many advanced concepts, JavaBeans, Swing, JSP, EJB etc...that I am a little lost)

Answer 1: I graduated with a bachelor's degree in college just a few months ago and I am currently working for a company that uses Java quite heavily. I was lucky that I got onto the staff that I am, but it wasn't all luck. Companies are looking for people who can not only program, but also communicate well and find the answers to questions on their own. Personally, if I were an employer that saw you completed the tests on your own, that would tell me that you have self-motivation and the yearn to learn: a definite plus considering how fast technology changes.

Bottom line is this: getting a job is tough, no matter what level experience you have. The main thing to keep in mind is that time is on your side. Your patience will win in the end.
--
by RyanDecker

Answer 2: Try with different government institutes (i.e. local, municipal, federal) when you are first starting out. Usually the more experienced programmers in the government go to the private industries after a few years and the government is looking for people to replace the ones who have left and this is usually a good place to start.
I hope this helps. Good luck in your search.
--
Robert

Q: I would like to know if the small programs that are attached in mail (like the small games for example) are usually coded in java or in any other language?

Answer: Usually not. Usually they're viruses.
--
Nils O. SelÅsdal

Q: An ordinary guy of ordinary intelligence, with some experience of html, do I stand a chance of learning java or do I need to be of an above average genius.

Any feedback would be welcome!

Answer: Java is extremely easy to learn...but will take a lifetime to be a master. Intelligence is not an issue.
--
drichard_007

Q: I have recently passed my Java Programmer Certification in the UK. Is there a standard logo I can use for my homepage & resume?

I have contacted Sun with this matter, but have received no reply.

Answer: You will receive information concerning how to get the logo, along with a "logo use agreement" from Sun in your SCJP package. As I recall, according to the agreement that you have to sign and send back to Sun before you are given the URL,
Before, when you get old agreement, you agreed not to place the logo on a web page or on your resume.
With new agreement you may use the logo in your resume. The new agreement is now the standard. All the candidates who signed an old agreement will be under the rules of the new agreement.
--
Clyde, Tym Tyler

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Miscellaneous - I

Q: What is the difference between Java and Microsoft Visual J++? Is there any specific difference? Please explain me I am novice to this field Part1

Answer: VJ++ was designed as a "spoiler" product -- Microsoft created some deliberate subtle incompatibilities so that when people wrote VJ++ code it would only run on Windows. This is not my opinion. This came out in evidence in Microsofts trial for anti-competitive behavior. In email they said things like they were going to "pollute" Java, and "piss on" the Swing libraries.

Some of the incompatibilities were in removing some standard fields from the system libraries. Others were adding some fields. They also added some differences to the language itself, in the way event
handlers were registered.

When Sun found out about Microsoft's attempt at sabotage, they cut-off all code deliveries to Microsoft, and sued Microsoft. That lawsuit just ended with the payment of $20M by Microsoft to Sun.
So Microsoft VJ++ is several releases out of date, and does not have many of the most important libraries, such as RMI and beans.

Bottom line: even though it has a nice GUI IDE, if you want to program in Java, you are better off avoiding VJ++, and using any of the free IDEs mentioned in the Java FAQ.

by Peter van der Linden http://www.afu.com
P.S by John: please read second part of this tip tomorrow and you will see you can use it with

JDK1.3!

Q: What is the difference between Java and Microsoft Visual J++? Is there any specific difference? Please explain me I am novice to this field Part2

Answer 2: Microsoft Visual J++ is a Java IDE for editing, compiling, and debugging Java source code. It also provides GUI editing tools that generate code for you you.

Visual J++ added some extensions to the pure Java language that you can easily disable.

The latest version of Visual J++ is 6.0. It supports JDK 1.1.
In order to use JDK 1.2, JDK 1.3, or beyond you must follow the procedure below:

Modify the CLASSPATH in the registry. Run RegEdit.exe and locate the
following key:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Java VM

and modify the CLASSPATH string to include the rt.jar file from you JDK
distribution. For example:

c:\Program Files\JavaSoft\JRE\1.3\lib\rt.jar

needs to be added to the end of the CLASSPATH string, and don't forget the semi-colon separating each entry in the string. Also note the "." at the end of the CLASSPATH string.
--
Roger L. Cauvin
rcauvin@homemail.com
http://www.thegym.net/rcauvin

Q: What is an asynchronous architecture?
Answer: In asynchronous architecture a program does not wait for return immediately. The program continues to do another staff and when does not care when it will happen.
Simple example: modeless dialog. You can do something else and return later to that dialog, change something and press “Apply“ button.
Synchronous example: modal dialog call, the procedure call it will not continue until the model dialog returns. For example, when you try to delete files you will be asked: “Are you sure that you want to delete file(s)?” You can not continue until you press “Yes”, “No” or “Cancel”.

Q: I want to know, can Java be run in DOS?
Not Visual J++ but just Java, can it run in DOS?
If so is the language is the same? I have been told that
java can run in DOS but I just want to verify...

Answer: Java technology relies on files with longer names than the old DOS limits, so if you are running older (pre-Microsoft Windows 95) versions of DOS, Java technology will not work. If you are running a version of DOS (such as the one that comes with Windows 95) that allows long file names, you should not have any problems.

Note that older versions of WinZip do not support long file names, even if the installed version of DOS does. You can get a free upgrade of WinZip with support for long file names from their web site.

source: http://java.sun.com/products/jdk/faq.html#E1

Q: I am just wondering. What is the difference between java and java2?

Answer: Java2 is really just another name for JRE/JDK1.2 and higher. Various things improved dramatically between JDK1.1 and JDK1.2, mainly in the libraries - things like the collection classes suddenly appeared.
The extensions mechanism was also introduced, and I suspect the security policy was firmed up (I've never needed to investigate that, fortunately).

Q: I am curious to know why Sun seems to ship two virtual machines (VMs) with their software development kit (SDK, aka JDK). I am talking in particular about JDK 2 v1.3 for win32, although this question may apply to other versions.

Here is where the VMs are on my installation:
c:\Program Files\jdk 1.3\bin\java.exe
c:\Program Files\jdk 1.3\jre\bin\java.exe

Incidentally, it also appears that there are lots of libraries in the jre\bin subdirectory that are not present in the other bin directory.

Both files are 21k on disk, and it seems unlikely that either of them are actually a true VM.

Answer: The EXE files aren't the VMs, they're just wrapper that invoke the VM.
The actual VM files are called JVM.DLL, and you'll find them in:
jre\bin\classic (basic, interpreted VM).
jre\bin\hotspot (the real thing).

If you invoke java.exe, you'll get hotspot by default. Use "java -classic" to get the old VM.
The main difference between them is that when you run java then you also get access to the java compiler and some extra "developer" stuff.
When running JRE you get a more streamlined version. Notice that it is possible to download just the JRE, which is a lot smaller than the full JDK.
--
kenny

Q: How to set the default memory limit of java virtual machine in a java application?

Answer 1: java -Xms16m -Xmx32m MainClassName
here: -Xms16m => 16meg initial memory allocation
-Xmx32m => 32meg max memory allocation

Answer 2: Run your Java program with -mx<number> switch like this:

java -mx128m ClassName

This for example will set maximum memory allocation pool to 128MB

Q: Do the classes in java.util.zip handle password-encrypted zip files? I've looked through the API, and I don't see any mention of it.

Answer: No, they don't. But Zip's built-in encryption isn't safe anyway by today's standards.

Q: I have a ZIP file and I want to check the file type of its entries WITHOUT unzipping it. Anyone knows how to do it?

Answer: You can't do this, unless knowing the file suffix is enough information for you. Then you can simply list the file names using the ZipFile class "entries()" method.

If you cannot determine the file type without examining the file itself, then obviously you must read the file, i.e. unpack the ZIP file.
--
Paul Lutus, www.arachnoid.com

Q: I want to compile a source file(.java) and then run it (.class) from inside another java program. How can I do that?

Answer: Make sure you place tools.jar on your class path.

If using JDK < 1.3, then use

public static int sun.tools.javac.Main.compile(String[] args);

if using JDK >= 1.3 then use

public static int com.sun.tools.javac.Main.compile(String[] args);

then if the result code indicates all is well (==0) the just go ahead and load the resulting class file, probably in a new class loader.
--
Neal M Gafter

Q: How do I make java apllication instalable? I have written a Java application and have the .class files in one location. How do I make it installable? Is it possible to convert it to an executable file?

Answer 1: just create a batchfile or a .sc file (if on unix)
Answer 2: Or check http://installshield.com/
They have special edition for Java which lets to write additional interface for configuring of

program parameters during instalation.

Q: I've got a Java application that I need to install on my future customer's computers but this is the first program that I've ever tried to sell to anybody and I want to keep my costs down.

Is there something out there that installs the JRE, if it needs to, and then my program ?

I know of InstallShield, InstallAnywhere and the like but I'm hoping to find something a lot cheaper since I'm just a small time operator (who may not sell even one of his programs).

Answer:
1. ZipCentral is a free Windows app that will create a zip file, or a self-extracting executable. It has the ability to execute a BAT file after unzipping your files. You can download a copy from

http://zipcentral.iscool.net/

2. Sun's Java Web Start (the price is right - free):

http://java.sun.com/products/javawebstart/index.html

JavaTM Web Start -- a new application-deployment technology -- gives you the power to launch full-featured applications with a single click from your Web browser. You can now download and launch applications, such as a complete spreadsheet program or an Internet chat client, without going through complicated installation procedures

3. Zerog's Now! http://www.zerog.com/downloads_01.html

There are no restrictions on the use of free products:
InstallAnywhere Now! and PowerUpdate Now!. Now! 4.01 is free, installs a JRE

Q: I need to know how to run Multiple JVMs on one machine. As far as I know if I run 2 different Java Programs on one machine at the same time, both of these programs use the SAME JVM. Is this statement right?

Answer: NO!. Each invocation of the 'java' command creates a new and separate JVM, at least in those JVMs based on the Sun code, and getting them to cooperate on a shared Java task is not automatic, and definitely non-trivial.

Q: I am totally confused about the differences between the SDK, JDK and IDE products

I am brand new to the world of Java and am most interested in learning the language. However, I am confused about the differences between the SDK, JDK and IDE products. I have gone to the Sun site and even some of the IDE vendor sites and I have yet to find something that tells me what the differences are between the three and which of the three I need to program in Java.

I want to program using some form of IDE but do I need to separately download and install a SDK and/or JDK? Sun needs to improve their documentation for us new to the Java environment.

Answer 1: IDE is an acronym for _I_ntegrated _D_evelopment _E_nvironment. These products are the one stop shops for coding, running and debugging your code. Often these will include GUI based drag and drop form designers and "wizards" for the shells of common forms of code (Application, Applet, etc.) JBuilder is an IDE.

The IDE may stand on its own, or it may act as a front end for a JDK.

JDK is _J_ava _D_esign _K_it. A JDK is a command line based interface to the JVM, plus the classes. You are responsible for your own editors, creating code for GUI elements, and all code. All of the IDE's I have reviewed personally come with JDK or their own vendor's equivalent (JVM and class libraries). Some IDE's are capable of a
sort of "upgrading" by downloading the latest JDK from Sun (JBuilder for example).

Answer 2: If you want to write a Java program using any editor and not an IDE then you would want to download the JDK. It will let you compile and run Java programs from the command line (like a DOS window).
JDK stands for Java Development Kit and SDK stands for Standard Development Kit.

Java comes in three versions - Standard, Enterprise, and Micro editions. JDK could be any one of the three. SDK is the standard one - this is the one most people use. If you want an IDE they typically come with a JDK so all you would need to do there is download the IDE and start using it.

Q: How does a java application stored within a jar file reference/edit/read other files (like .txt, or data files,) that are also within the jar file?

Answer: Classes located in a JAR archive are loaded via a class loader whose purpose is to load classes form JAR archives. This ClassLoader implements the getResource and getResourceAsStream methods to retrieve files from the JAR file. So you can take any class from the JAR and say ClassName.class.getClassLoader().getResource("fname"); to get the resource and use it.

Q: I want to keep my java GUI always on the top of any other desktop application. Any idea?

I want to keep my java GUI always on the top of any other desktop application. Any idea?

Answer: Spawn a thread that knows about the parent Window, and every X milliseconds, executes the toFront () command of that window. Just remember to execute it using SwingUtilities.invokeLater (), and don't
let your users launch two apps, unless you enjoy screen lockup.

Q: I am beginner in Java and know that Java program runs on Java Virtual Machine. But

how does Java works with file systems? They are real. How Java does solve this problem? For example if I want to modify ACL (Access list) on UNIX.
There are no ACLs in Windows. No such method in API as well.
Does it mean that file system of Java is quite limited?

Answer: Yes, it is limited in some sense... Java supposed to run everywhere. "Everywhere" actually means that SUN limited file system functionality by common (for most OSs) methods. It is strength of Java and weakness as well.
Since Java 1.2 we got at least some functions like: setLastModified() similar to touch() function in UNIX.
Or listRoots() returns the list of all disks available in the system. It is important for Windows systems (On Unix all partitions are mounted to root "/." and has no names like in Win: A:\, C:\)
I hope in future we will get even more.
--
Luis

Q: Can a java application be run of a CD without installing anything (i.e. runtime, etc) on the target computer?

I would like to put my application and hand it out as a demo, but I want to make it easy to view.

Answer 1: by Dale King The JRE was made so that it didn't need to be "installed". What I did in one case was to simply put the JRE into a jre folder in the same directory as my application then invoke it from that directory using:

jre\bin\jre.exe -cp MyJar.java MyClass

That was for JDK1.1 and you have to modify it slightly for Java 2. But this did not require any installation of environment variables to be set up. The JRE was smart enough to know how to get to its system classes relative to where the jre.exe file was located.

Answer 2: you could try a Java to native compiler.

Q: I would like to know whether it is possible to test the memory, so as to avoid the OutOfMemoryError or whether it is possible to increase the amount of memory in the JRM.

Answer: You can get the total and available memory used by the VM by making two calls from the Runtime class:

```
Runtime runtime = Runtime.getRuntime();
long free = runtime.freeMemory(); //the available memory
long total = runtime.totalMemory(); // the total for the JVM
```

The amount returned be totalMemory() isn't that useful unless you specify how much memory your program will have from the beginning (if you don't, the JVM will just keep grabbing more until you run out).
You can set the initial and maximum memory from the command line:
java -Xms64m -Xmx64m name.of.Application

This will start your appplication with 64 megs initial and maximum memory.
--
Corey Wineman

Q: I run some code in my program like this:

```
Runtime rt = Runtime.getRuntime();
rt.exec("C:/StartMyApp.bat");
```

I get very strange behavior: sometime it starts from first time, sometime I need to call it a few times and often it does not start at all after I run it once..

Answer: You need to modify your code since you execute your bat file in the MSDOS shell (Win95/98) or command line shell"cmd.exe" (NT).
You should use exec(String[] cmdarray) not exec(String cmd) method...

Q: What needs to be done to reduce size of a jar file? What optimization techniques to use on classes inside the jar file? What tools if any?

Answer: A JAR file is a ZIP archive. You can influence its size by choosing the degree of compression you want to have. This is usually defined by a value between 0 (no compression) and 9 (maximum compression). Although JAR tool does not list a -9 switch, you might want to create compressed JARs with any ZIP tool like Winzip or the free Info-ZIP zip command line tool.
The amount of reduction you get totally depends on the nature of your data.
Note that if you use compression in your JAR file, loading goes slower (classes must be decompressed).

Q: Is there any way to run code after the VM has been instructed to exit?

Answer: In 1.3, you can use Runtime.addShutdownHook(Thread hook)

Q: Where can I find Java --> Native code compilers?

Answer: We just published a list of Java products that lets you do
Java --> Native code compilation:
http://javafaq.nu/java/staff/staff.shtml

Q: I have a directory having class files arranged in package hierarcy. How can I make the executable of this whole directory?

Any application available for that in Windows NT environment.

Answer: Make a JAR file out of it and add a manifest file that indicates which main() method of which class must be called.
Double-clicking this JAR file will run your application.

Q: I'm interested in writing a little mp3 player in Java...

I'm interested in writing a little mp3 player in java. I have an entirely different app right now that plays sound (wav files), and I substituted an mp3 file for one of the waves but it didn't work. Can anyone tell me if java even supports mp3 files?

Answer: Go to the "Products & APIs" section of java.sun.com and look for JMF (Java Media Framework). It's a library that also supports reading MP3 files.

Q: Are there any tools out there that will convert a program writen in C to JAVA?

Answer: Yes.

C2J: http://www.novosoft-us.com/NS2B.nsf/w1/C2J
C2J has successfully compiled itself as well as programs such as PGP and YACC. Obviously YMMV.

Based on C2J is a C++ to Java tool: http://sol.pace.edu/~tilevich/c2j.html
--
jim

Q: Can we create DLLs in java??? if yes How???

Answer: Unfortunately it is impossible. DLL stands for Dynamic Linking Library and has definite structure inside. DLL is a part of executable code and helps to make an application for Windows to be more smaller. And more flexible. It is something like classes but compiled (Java class files are byte codes and JDK compiles them during the runtime...).
In Java it is not possible to make an executable code. But with third party software Yes!
See native compilers on our site.
But I didn't hear about creating DLLs.

So my answer is: in Java it is not possible, but with third party applications it is possible theoretically. Although I do not know any compilers that produce DLLs there is no limitations to do that....
--
John

Q: Does anyone know of a java machine that will run from a 1.44Mb Floppy? I have an application I want to run from a dos 7.1 floppy disk.

Answer: please check here:
http://www.transvirtual.com/kaffe-features.htm
there is written:

"Efficiency is not just about execution speed, but Kaffe's JIT is quite speedy: it runs Java code

only 30% slower than plain C. Such things as memory consumption of a JIT-enabled, graphical Kaffe are also important.
Here we can execute a full system on a 4 MB DOS system, and the VM and library footprint won't exceed 1 MB. Our complete source tree fits on a single 1.4 MB floppy. This is what we mean by "efficiency".

Good enough for you?

Q: Anybody know a good tool to distribute your made java classes with for windows platforms?

I want to create a setup file that alse verifies existence of java runtimes etc etc and creates a shortcut and that kinda things...I tried looking into Wise installation systems and Installshield asswel, but they are both not really build for this kinda things...

Answer: You should try, InstallAnywhere by ZeroG (http://www.zerog.com)

ZeroG has a free version call, "InstallAnywhere NOW". You should give it a try, its a really easy-to-use java installer. It has all the features you need, such as creating an Icon on your desktop, creating a folder under the Windows "Start" button, it can be set to have the user search for a JVM on their computer, and much much more... (I sound like a commercial, hehehe)
JHig310336

Q: I see all the time in the code examples that some Exception is caught but has empty body. Is it a good practice?

Answer: No, it is not! Of course it lets to run program but does not treat the problem. It should be logged at least for further analysis. This "lazy programming" approach finally fools even the author.
For example, in case of network connection: no Exception report, and of course no connection. If your program full of such Exception handlers you will just sit and guess what has happened.
--
AP. (J.A.)

Q: Heap size limit!! I am running JVM from JDK 1.2 on Solaris 2.7 and I couldn't allocate the max heapsize over 2G when I invoke the JVM.

I have repetive tasks that take 500m memory each to run, so I naturally want to run as many threads as possible. I figured out this 2G (-mx2047m) limit by trial and error but is there any way out of this? My workstation happen to have 2G physical memory, and the file size limit is 2G as well (from ulimit), are there any co-relation among those numbers?

Answer: Yes, there is a relation: both result from limiting addressing space to what you can get with signed 32-bit ints for addresses:
2^31 - 1 = 2 * 2^30 -1 = 2 * 1 GB -1 = 2 GB

One of the interesting features of Java, is you could run the code with 64 bit addresses, and

nothing would need to change in either the source code or the class files. The only difference would be you could hold a lot more objects and stack frames before you blew virtual RAM.

Obviously you would need a different JVM or Hotspot.

Java never lets you discover how big references really are inside or how they are implemented, e.g. as pointers or as handles, or even the granularity of the addressibility of your machine.
On a 32-bit OS it is a liitle hard to get 32+ bit memory space. How about you try a 64-bit Solaris 8?
answered by Michiel,
Roedy Green,
JAVA GLOSSARY see http://www.mindprod.com/jgloss.html,
Johnny Bravo

Q: How can I format a diskette using Java? And, what's the way to get the diskette's size?

Answer: As far as I know: no. Formatting a disk is strongly system dependant, so you can hardly do this with java.

You *can* however start a new process, have it open a shell or any other kind of command processor your particular operating system uses, and issue the format command.
> And, what's the way to get the
> diskette's size?
Again system dependant.
--
Ansgar W. Konermann

Q: I am a 17 year old in the JDK version 1.1 . Is it worth upgrading and getting a later package, and learning swing?

If so, why?

Answer: Yes.

Java 1.3 provides many performance improvements and library additions which will make your life as a programmer easier.

Swing is "better" than the AWT in that because it is mostly written in Java - it has the advantage of the same look-and-feel across different platforms (which the AWT was crap at). The reference of the other learned poster to a mainframe is the common argument that Swing is slow. This _is_ true, however only if you build large applications and I doubt that at the moment you will.
In the future you also have the option of compiling your Swing classes to native code (viewed as a venerable evil by some some, but a practical solution by others) or performing other oprtimisation tricks that will see your GUI apps not only looking great and being cross-platform, but also performing well.

It's what we call in the trade a no-brainer. Time to get Swinging young chap.
--
pip

Q: Is it possible to create a Jar file that is not unjarable?

Or only unjarable on a certain domain/server? Is the jar.exe JDK-specific (I don't believe so)? Was I just asleep at the command line and imagining the whole thing?

Answer: You could conceivably encrypt a jar with a password, but you wouldn't be able to start the application from that jar. You could have another jar that actually knows how to decrypt it and creates its own decrypting class loader. Of course your startup jar could be hacked allowing someone to figure out how to decrypt the jar. So once again, you can slow down the process and make it more painful but you can't make it impossible.

To make this workable it would probably be a lot easier to encrypt the files within the jar rather than the jar itself, since you need random access to the jar file, but only sequential access to the files within. It is more difficult to write a good random access encryption scheme. This would allow you to unjar the files, but the files would be unintelligible. You might also apply a cipher to the file names in the jar so someone would not know whether a file was a class or a resource file.
--
Dale King

Q: How does the system find the path to JDK 1.2 after I type in "java -version"?

I installed the jdk1.2 on a NT system, also VisualCafe4.1 with jdk1.3 was installed on the same system. After typing in "java -version" in a DOS window, I always see java.exe 1.2 is invoked even though I couldn't find the path to JDK 1.2 from the system environment parameters. How does the system find the path to JDK 1.2 after I type in "java -version"?

The reason I ask this question because I want to invoke jdk1.3 under a DOS window without uninstall jdk1.2. I did add a path to jdk1.3 in system environment and reboot the system, but JDK 1.2's java.exe was still invoked after typing in "java -version" in a DOS window.

Answer: Because when the JDK install kit placed the two programs java.exe and javaw.exe in the WINDIR and that's in the PATH. And these programs read the registry to find the JDK/JRE.

If you placed jdk1.3\bin in the PATH before WINDIR, you should be fine. From your description, I guess you didn't, so you're still getting jdk1.2. Or you can directly execute jdk1.3\bin\java.exe which will work.

Another trick I use to swap JDK's in an out is to place the directory named java\bin into the PATH and just rename the desired JDK to java, like this:

c:\>dir j*

Volume in drive C has no label

Volume Serial Number is 07CF-0B17
Directory of C:\

JDK12~1 2 <DIR> 03-19-00 1:57a jdk1.2.2
JDK13~1 0 <DIR> 12-21-00 1:42a jdk1.3.0
JDK11~1 8 <DIR> 06-16-00 2:29p jdk1.1.8
0 file(s) 0 bytes
3 dir(s) 16,252.02 MB free

c:\>PATH
PATH=c:\java\bin;c:\tools;c:\windows;c:\windows\command
c:\>ren jdk1.2.2 java

If I wanted to switch to JDK 1.3.0, I simply do:

c:\>ren java jdk1.2.2
c:\>ren jdk1.3.0 java

and voila! new JVM. The drawback here is you need to know what the current one is, but that's simple using java -version or by process of elimination.
--
Joseph A. Millar

Q: what is the difference between "C:\\" and "C:\\." ?

In the following codes. can anyone explain this ?

File dir = new File("C:\\");
String [ ] files = dir .list();

File dir = new File("C:\\.");
String[] files = dir.list();

Answer: "." is used to refer to the current directory. For example, using the change directory command "cd ." changes you to the current directory, effectively doing nothing.
"c:\\.\Files\image.jpg" is exactly the same as saying
"c:\\Files\image.jpg"

The code you gave should do exactly the same thing in both forms, to my mind - return a list of the files in the root of the c:\ partition.
--
Lloyd Colling
http://members.xoom.com/lcolling/

Q: This is likely a very silly question. I need to create a .cab file, but I have no idea how to do it...

Answer: Microsoft has a tool for it. See

http://msdn.microsoft.com/workshop/management/cab/cab.asp

You can also get a shareware version of a Cabinet Manager (easier to use than the MS tool) from
http://www.micrognet.com/
--
Jos

or you can download a free *.cab tool at:
http://home.t-online.de/home/lars.hederer/english.htm

Q: Why we can reengineer Java byte code (.class file) back to Java source code? But why binary .exe file we are unable to do it? What is the significant difference?

Answer: AFAIK, Java byte code goes back to _some_ source, not to the original source. So, reverse engineering is limited.

> But why binary .exe file we are unable to do it? What is the significant difference?

(a) There is more than one way to do something using C++.
(b) There are highly optimizing C++ compilers.
(c) You won't get the original source anyway. See (a).

Imagine that your C++ code contains inline functions. The compiler is free do place the body of it replacing a call, or instantiate the function and provide a real call to it. First, there is no way to know when it is going to do one or the other. Second, with some code inlined, how to decide what _was_ an inline function and what wasn't?

So, the answer is: the distances between the levels of abstraction between byte code and Java source and between machine code and C++ source are significantly different. The bigger the distance, the less possible it is to recreate the source code.

Victor Bazarov

in java bytecode all the original variable names are kept. in an exe file smaller symbols are used.

Some .exe decompilers are good enough to convince a jury that the "original" source code was reconstituted. See the Microsoft v. Stac case for an example.

Java is easier, but C is still possible.

Q: I am attempting to write a program that recursively calls a method in order to go down a directory tree, read the information in each directory concerning their files, then write that information to a text file. Are there any built-in methods or programs in Java 1.3 to do this?

Answer: Here is a recursive example for finding a file.

```
static public String Findfile(String dir, String to_find) {
```

```
  int i;
  String results;

  String dir_list[]=(new File(dir)).list();
  for (i = 0; i < dir_list.length; i++) {
    File to_test = new File(dir,dir_list[i]);
    if (to_test.isDirectory()) {
        results = Findfile(to_test.getAbsolutePath(),to_find);
        if (results.length() > 0) return results;
    } else {
        if ((to_test.getName()).equalsIgnoreCase(to_find))
           return to_test.getAbsolutePath();
    }
  }
  return "";
}
```

Regards,...Ron

Q: I use the function inside of my class that has the same name in another class of my package. It seems working that program can be confused by this and it seems working better if I use this function within of class like this:

this.XXX();
How does Java distinguish the same methods in different classes?

Answer: Suppose you're inside a method and you'd like to get the reference to the current object. Since that reference is passed secretly by the compiler, there's no identifier for it. However, for this purpose there's a keyword: this. "This" keyword–which can be used only inside a method–produces the reference to the object the method has been called for. You can treat this reference just like any other object reference. Keep in mind that if you're calling a method of your class from within another method of your class, you don't need to use this; you simply call the method. The current this reference is automatically used for the other method. Thus you can say:

```
class Apricot {
void pick() { /* ... */ }
void pit() { pick(); /* ... */ }
}
```

Inside pit( ), you could say this.pick( ) but there's no need to. The compiler does it for you automatically. The "this" keyword is used only for those special cases in which you need to explicitly use the reference to the current object. For example, it's often used in return statements when you want to return the reference to the current object:
source: "Thinking in Java" http://www.javafaq.nu/java/book/Contents.shtml

Q: My friend claim that garbage collectors do not collect int value since they are not created with new() method..

Is he right?

Answer: Programmers know about the importance of initialization, but often forget the importance of cleanup. After all, who needs to clean up an int? But with libraries, simply “letting go” of an object once you’re done with it is not always safe. Of course, Java has the garbage collector to reclaim the memory of objects that are no longer used. Now consider a very unusual case. Suppose your object allocates “special” memory without using new. The garbage collector knows only how to release memory allocated with new, so it won’t know how to release the object’s “special” memory. To handle this case, Java provides a method called finalize( ) that you can define for your class. Here’s how it’s supposed to work. When the garbage collector is ready to release the storage used for your object, it will first call finalize( ), and only on the next garbage-collection pass will it reclaim the object’s memory. So if you choose to use finalize( ), it gives you the ability to perform some important cleanup at the time of garbage collection.

source: http://www.javafaq.nu/java/book/Chapter04.shtml#Heading169

Q: In my program where I use finalizers to help GC to free the memory faster... But it seems that it is difficult to know when it happens. I tried to find it and see that even on the same machine my program runs differently...

Answer: You are right! Garbage collection happens differently each time because it based not on definite schedule but quite complicate alghorithms that take into consideration many factors such as CPU load, number of variables, memory size and so on.
Even developers of JVMs just guess when some process can start but not exactly. Since we have many JVMs, Java programmers, therefore, should avoid writing code for which program correctness depends upon the timely finalization of objects. For example, if a finalizer of an unreferenced object releases a resource that is needed again later by the program, the resource will not be made available until after the garbage collector has run the object finalizer. If the program needs the resource before the garbage collector has gotten around to finalizing the unreferenced object, the program is out of luck.
--
AP. (J.A.)

Q: Does Garbage Collection hang my program for a while?

Answer: Well, of course it somehow "hungs" if you run your program on one CPU. Not in terms that it hungs until some GC-ing is over.
Usually well written GC runs in own thread, alongside to your Java program and does not more time than any other thread.
Your program will not wait until some point is reached in GC but rather wait some amount of time which the GC-ing thread allowed to take.
--
AP. (J.A.)

Q: Could you please tell the advantages and disadvantages of having Garbage Collecting in Java?

Answer:
1. Although the programmer still allocates data structures, they are never explicitly freed. Instead, they are "garbage collected" when no live references to them are detected. This avoids the problem of having a live pointer to a dead object.
So, GC "keeps" eye on amount of memory allocated by program and tries to free memory of unreferenced objects in "good" (when your program does not consume much CPU) time.
You do not need to do free() operation like in C++. GC does it for you. Most of memory leaks happen due to bugs in Java itself rather than bad programming (happens also :-))
In a large application, a good garbage collector is more efficient than malloc/free
2. GC makes heap defragmentation (merges the small pieces of free memory into one big piece) that increases performance on the fly. It is difficult to do such thing easy in most of programs written on C++.
3. Your time! If you have fast enough CPU and good GC you will save a lot of time. Manual tuning of a millions pieces of code like malloc/free will take so much time that increases the cost of project dramatically!
Let say like this if you have slow CPU and small program then C++ with malloc/free is more efficient. If you have big one - rely on GC!
4. Security issue: Java programmers cannot crash the JVM by incorrectly freeing memory

Main disadvantage is that GC adds overhead that can affect performance. In some real time it is critically important that no GC-ing will run in definite periods of time..
--
AP. (J.A.)

Q: Do I need to call Garbage Collector gc() explicitly? If not why then does exist this method?

Answer: Do not afraid, if you do not call gc() it will run anyway! You can be sure that GC-ing happens anyway...
Why does SUN provide us such method?
I see two reasons at least for having it:

1. Time critical applications. If you know that in some moment it is safe to run GC call it. Probably it will run immediately. Not always.
Anyway it can provide better distribution of GC-ing in time increasing GC activity in "safe" time

2. Test applications. It can help you to be sure that your objects will be collected faster than usually.

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Miscellaneous - II

Q: Is it possible to know if a file changed?

Answer: The are some techniques:

1. Trust the last change date the OS maintains. The file could have had an Oscar Wilde pulled on it, insert a comma and take it out again so the last change date records a change, but it is not really changed.

2. Check the file size. Most chances will trigger a file size change.

3. Compute a digest, e.g. a 64 bit Adlerian checksum. If it is the same, chances are nothing really changed. The odds are quite astronomically small you could have a change and not detect it, but it is theoretically possible.

4. Compare the old and new files with .equals() after reading them into RAM, possibly in chunks.

I talk peripherally about these issues in the automatic file updater student project and the delta creator project in the student projects section of the java glossary.
--
Roedy Green
http://mindprod.com
http://209.153.246.39

Q: Can I access/use COM objects with Java without having to use Microsoft's J++?

I have a database app that has an API that uses COM objects and I would like to do all development in Java and JSP.

Answer 1: Two options I know of. JIntegra from www.linar.com or alternatively the open source product, Jacob from http://users.rcn.com/danadler/jacob/.

Phil
Answer 2: IBM also has a product called something like Bridge2OLE. An then there is always the option of doing it yourself plain vanilla JNI.

Jim S

Q: How can I calculate number of bytes occupied by an object in memory?

I have a object as follows:

```
public class obj {
   private String str = new String("ABCDE");
   private int i;
}
```

If I create ten objects of Obj class, how much memory space do they occupy?

Answer: The Runtime.totalMemory() method should help. However, because memory is being allocated and deallocated all the time, you should probably create a lot of the same objects and then divide the change in memory by the number of objects.

```
class MemoryTest {

   protected static final long COUNT = 100;

   public static void main(String[] arg) {
      long start, end, difference;
      Object[] array = new Object[COUNT];
      long i;

      Runtime.getRuntime.gc(); // let's hope the
      // garbage collector runs
      start = Runtime.getRuntime().totalMemory();
      for (i = 0; i < COUNT; i++) {
         array[i] = new Object();
      }
      Runtime.getRuntime.gc();
      end = Runtime.getRuntime().totalMemory();
      difference = (end - start) / COUNT;
      System.out.println("Approximately " + difference
                  + " bytes used by 1 java.lang.Object with default constructor");
```

```
    }
}
```

WARNING: Strings are optimized to use as little memory as possible by reusing the same object if the strings are the same. You're going to have to do something special to test these out:
1. Make a program to write a bunch of random, same-length strings to a file (Let's say "strings.txt").
2. Use the code given above.
3. Before you calculate the start, open "strings.txt" with a FileReader or input stream.
4. In the for loop, read the a string from the file and put it in the array.
5. Close the file after the second call to the totalMemory() method.

If you use this code in any other form, don't declare or construct any objects between the calls to the totalMemory() methods. This could alter results.

this tip is from http://developer.java.sun.com/developer/qow/archive/107/index.html site

Q: Can anyone tell me where can I find the specification of the bytecode and the VM??

Answer: See http://java.sun.com/docs/books/vmspec/index.html

Q: Would anyone out there have any recommendations/feedback on any good Java free profiling software?

Answer: If you are looking for a free product, take a look at HPjmeter from hp at
http://www.hp.com/products1/unix/java/hpjmeter/index.html
I have found some trouble running it under win98 but it's quite useful.
--
xevi.

Q: If X is in the default package, any class should be able to find it without an import, right?

This one has me completely stumped :-/

Take the following two source files:

X.java:

```
public class X {
}
```

Y.java:

```
package test;
public class Y {
  X x;
}
```

X compiles, but Y doesn't. It fails with the error "Cannot resolve symbol X". A similar error is found under jikes.

If X is in the default package, any class should be able to find it without an import, right?

Answer: It's not an error: You don't import X anywhere, so the compiler _must_ assume it's in the same package. Since test.X doesn't exist, it cannot find it. The compiler does _not_ automatically use the default package, it defaults to the _current_ package.

To resolve it, add

import X;

to the Y.java file.
--
Tor Iver Wilhelmsen

Q: Do you guys know if it is possible to make executable files with Kawa, because I only see an option to make jar files (and even that is confusing as hell)?

On the side note, does anyone know how to make a little batch file to run the jar (so that I don't have to write stuff like java -jar run.jar)?

Answer: I suspect it doesn't allow static compilation - that's a much harder job. Executable jar files are the preferred approach in many cases anyway.

But here unusual receipt of malign of exe files pointed by Tom Almy! If you have a C compiler, you can make your own executables (which require the Java runtime be installed) using any Java design environment.

Assuming the jar file Foo.jar with main class Bar, here are the steps to making Foo.exe:

1. Compile the following program runner.c to runner.exe:
#include <process.h>
int main(void) { execlp("java.exe", "java.exe", "-cp", "foo.exe", "Bar", NULL); return 0; }
2. Concatenate the runner.exe and foo.jar files:
copy /b runner.exe+foo.jar foo.exe

You are done!
--
Tom Almy

Q: How to prevent disassembling class ? If I develop a commercial product, I don't want to give my sources to a JAD user...

Answer: There are three basic options:

A) Use an obfuscator (which will prevent casual disassembly, but may not stop determined reverse-engineers)

B) Use a client-server solution. The important code runs on a server controlled by you, and the user never sees the bytecode at all.

C) Make all your customers sign a legal contract promising not to disassemble the code, or they have to pay a huge fine.

P.S: JAD is extremelly easy to use Java Decompiler program written by Pavel Kouznetsov

Q: Does anyone do this & if so do you have a bat file which swaps between different JVM'es? Do I have to reboot NT once I change the path?

Answer: Yes you can. Just change the PATH environment variable in a DOS in WIN95-98 (command promt in NT) session, and in THAT session (and that session only), the version specified
will be used. To change it permanently you have to reboot.

Or you can consider using development tools like VCafe, JBuilder, VisualAge, etc. They usually have the function to set which JVM/Compiler to use. If you change the variable (in NT) in the Control Panel, System, you do not have to reboot.
Using Batchfiles will not work as a switch, however, since the variables are only valid during that batch session, so you would have to remain in that session and execute your command-line commands there to use the changed variables.

Q: Do I need to include all JAR files in CLASSPATH?

When you say java classpath = /directory1;. helloWorld do all *.jars in /directory1 get included? I have seen mixed behavior (sometimes they got included, sometimes not) with different jdk installations (NT, Solaris, 1.2.2, and 1.3). I can't find any definitive answer to the question anywhere. Thanks in advance.

Answer: .JAR files are not included when you just specify the path to a directory. You must explicitly call out each .jar and .zip file as part of your classpath. It's a pain but you just gotta do it. I have not worked with 1.3 yet, so maybe they've changed something there, but if you follow this rule it will always work, regardless of the version.
The one exception to this rule is the /jre/lib/ext directory. This special directory is scanned when the JVM boots up and any .jar archives found in it are automatically added to the classpath. This is the only way that .jar files may be added to the classpath without explicitly listing them.

Q: How can I launch external applications from a Java application?

I mean what is the method that i got to invoke when i get an event like mouseclick to launch another application like photoshop or any other one???

Answer: Runtime.getRuntime().exec("notepad.exe");

that will launch notepad from withing a java app.

Q: Is there free tool for automatic drawing the UML diagram from a java source? (LINUX)

Answer: JVision generates UML from java source. The Linux version is free for non-commercial use.
See http://www.object-insight.com

Q: Again about classpath variable

I have a java program that I need to run through DOS, but my computer isn't set up for this, as I normally use textpad.
Anyway, I am a bit confused about what to use as my classpaths. I know that I need them, but do I need one for the jdk1.3 file, and then where do I have to run my program from, in that directory?
Could some one please explain, as I've been to the sun setting up classpaths page, and I didn't really get it...

Answer: What I usually do is this:

set my path to include the java\bin directory (the directory where java.exe and javac.exe are)

in dos the command is:

PATH=%PATH%;c:\java\bin\

then go to the directory where my project is and type the following to compile:

javac *.java

and to run:

java myproj (where myproj.class contains your main method)

or to run with the support of outside classes:

java -classpath QTJava.zip;skinRegion.jar;. myproj

QTJava is required for QuickTime
skinRegion provides extra tools for configuring your windows (and gui!)

generally if you don't need extra classes in your program (outside the ones that ship with java) you won't need to specify a classpath

Hope that helps!
--
Jonah Braun

P.S. by John: From my point of view classpath environment variable cause much troubles! I did not see any Java programmer that has not problem with this variable.

I agree that this thing could be done in some better, more clear for understanding, way.
Unfortunately, SUN's documentation quite often is very poor and not friendly to us.
Such good and big company could give more and better examples to technologies that they developed!
Often just give at least one example...

Q: I have had a poke around the collections lot and I can't seem to find any implementation of a FIFO stack, I've found a FILO stack but no FIFO.

Anyone one knows of one already implemented in the standard API for JDK 1.4 beta 2?

Answer: That might be because stacks *are* FILO structures. FIFO structures are usually called queues or deques (double ended queues). Anyway, LinkedList will do what you want, just add to one end and remove from the other.
--
Michiel

Q: We are looking for a Java code obfuscator to prevent our code from being decompiled. Can anybody recommend a good tool?

Answer, Part 1: Compilation to optimised native code is more efficient than obfuscation.
If your only deployment platform is Windows, have a look at our
Excelsior JET native compiler:
http://www.excelsior-usa.com/jet.html
Aside from the obfuscators others recommend, there is IBM's JAX obfuscator:
http://www.research.ibm.com/jax/
and you can try JProof at www.jproof.com free!

and Preemptive's DashoPro obfuscator:
http://www.preemptive.com/
--
Dmitry Leskov

Q: I am looking for a free downloadable Java IDE, is there such software?

Answer: Try out these IDE's:
http://www.borland.com/jbuilder/foundation
http://www.sun.com/forte/ffj/index.html
http://www.netbeans.org
--
Klaus Hartlage

Q: The javac compiler, which I downloaded for free as part of the Java 2 SDK, complains when I give it a file that has more than one public declaration.

It tells me, I have to put each public class in its own file. Is there any way around this?

I got the source code from someone using Codewarrior. Apparently, that compiler isn't so fussy. I would still prefer to use javac (the price is right). But I still have a lot to learn about Java.
Am I missing something simple? Some command line option or something?

Answer: By definition in the Java Language Reference, any source file must contain one and only one public class. You are allowed to include as many other non-public classes as you wish; but one and only one public class of the same name as the source file.

Filename: JavaTips.java

```
public class JavaTipOne{
   public static void main(String[] args){
     // do smth here
   }
}
class JavaTipTwo{
}
```

--
Dave Alger

Q: I want to put debugging code in my java classes that I can disable at a later date easily. Is there a way?

Answer: A simple solution would be to set a boolean flag such as
private static final boolean DEBUG = true;
in the class or classes you wish to debug. Then when you want to turn debugging off you can simply set the flag to false.

Your trace statements would then look like:

```
if(DEBUG){
   System.out.println("Debug statement");
   // other stuff
}
```

--
Rob

Q: I want to put a web site on CD-ROM in 8.3 file name format. The problem I have is that one of the files has the form "janorama.class" and when I change it to "janorama.cla" the javascript is no longer run.

I have tried changing <applet code="Janorama.class" to <applet code="Janorama.cla"
as well as changing the file extension.
Can any one tell me how I can accomplish this.

Answer: Use a JAR file! It has *.jar extension - just 3 letters!

Q: What does one type on the keyboard to produce the end of file character? I'm using forte and I tried ctrl z, but this is not break my code out of the while loop which loops until the EOF Character is encountered. Any ideas?

Answer: There is no EOF character. The different input classes report the EOF condition in different ways. For example InputStream.read() will return the value -1 if you try to read more data than is available.
On the other hand, BufferedReader.readLine() will return a null for an attempt to read more data when there is none left. What input class did you use?

Most operating systems report EOF condition to the program automatically when reading from files, but they have a hard time doing so for keyboard input. The OS usually provides a special character sequence you can type to indicate to the OS you are done, the OS in turn reports EOF to your program.
But the character you type is not an EOF character that you can test for in your code. (You didn't post your code so I have to guess this is what you tried, a common gotcha.)

On DOS and Windows9x, the character to type is control-Z. On Macintosh and Unix (and Linux) the character is control-D.
--
Wayne Pollock

Q: Were significant performance improvements made in the debugger between these versions?

When I start Weblogic under the debugger in JBuilder Foundation 4.0, it takes 9 minutes under 1.3.0, but only 1 minute using 1.3.1.
I couldn't see any mention of this in the release notes for 1.3.1 -- am I missing something?

Answer: 1.3.0 has a bug in Hotspot which makes debugging using the new APIs (which JBuilder uses) crawl. The workaround is to use the old JIT-enabled VM through the -classic option.

I don't know why 1.3.1's release notes wouldn't mention this.
--
Tor Iver Wilhelmsen

Q: I am in a situation where I have to dynamically generate classes. How do I compile and then call these classes? This is what I have figured out so far:

```
// the class will be a sub-class of GeneratedClass;
StringBuffer code = generateClass();

??? compile code ???

Class aClass = Class.forClass(myGeneratedClassName);
GeneratedClass obj = (GeneratedClass) aClass.newInstance();
```

Basically I need the code to fill in between the ???s above.

Answer: I would start by saving it to a file appropriately named. Then call
Runtime.exec("javac filename.java");

that should make a class file which you can then load if its in your classpath.
There might be an easier way, but I am not aware of it.
--
C. Lamont Gilbert

Q: Here is a small query. How to get % of memory usage in Java.

freeMemory() gives the long value of memory .
After certain % usage of CPU I want to take some action, so how to get this % usage value .

Answer:

```
Runtime rt = Runtime.getRuntime();
long freeMem = rt.freeMemory();
long totMem = rt.totalMemory();
long usedMem = totMem - freeMem;
double percentUsed = (double)usedMem / (double)totMem;
```

Q: Is it possible to make application that goes into tray Icon area?

To put java application in tray Icon area, How can I do?

Answer: That area is a OS specific area. You will need the JNI...
A work around that you could use to stay away from JNI, is maybe to use a VB app that sits in the tray for you then have your java app check a file called stats.dat (as an example) every 2 seconds or so to see if the VB app has put some info in their that your java app may need.

Its shifty but it works.
--
Vincent Panuccio

Q: Jikes is much faster, but are there any other reasons that jikes is better/worse than javac? Any useful features of either one that make it better?

I've heard javac's incremental compiling does work well. Any truth to this or other opinions?

Answer: Jikes compiles much faster but the resulting code goes at the same speed and won't work with some debuggers like Jbuilder 4

Q: Here is a small query. How to get % of memory usage in Java.

freeMemory() gives the long value of memory .
After certain % usage of CPU I want to take some action, so how to get this % usage value .

Answer:
```
Runtime rt = Runtime.getRuntime();
long freeMem = rt.freeMemory();
long totMem = rt.totalMemory();
long usedMem = totMem - freeMem;
double percentUsed = (double)usedMem / (double)totMem;
```

Q: I'm trying to use the "exec" method in the java.lang.Runtime class, to control Netscape remotely. But I'm doing something wrong, because when I run the program, all the exec statements are just ignored, no matter what they were supposed to do.

The test program reads something like this:

```
public static void main (String[] args) throws java.io.IOException {
  Runtime R=Runtime.getRuntime();
  // R.exit(0);
  Process p1= R.exec("ls");
  System.out.println("nothing nothing");
  Process p2= R.exec("netscape -remote 'openURL(http://www.uiuc.edu)'");
}
```

the program prints "nothing nothing" and exits. If I uncomment the line R.exit(0) the program does exits...
So, I don't know what is happening.
I'm sure it is just a dummy detail you can tell me just by looking at the program.

Answer: The problem is that Java does not have the concept of a shell environment.
That means it doesn't have a PATH environment variable, so it can't find what you are trying to execute.
Instead of "ls", use "/bin/ls". In other words, always include the fully qualified path to the executable.
--
Mitch

Q: Is there any way to change the classpath on the fly?

That is from within an application I want to be able to change the classpath so it includes a new jar file.

Answer: You have to write your own class loader, which is prepared to search the additional jar(s).
Well, you have to use a new *instance* of a class loader - but URLClassLoader should usually be good enough, so you don't need to write your own custom ClassLoader.
--
Laz E. Knights

Q: I'm new to Java programming. I don't understand some things in this code:

import java.awt.event.*;
import java.awt.*;

//MY QUESTION: Why do we need to use "import java.awt.event.*;"? We have already imported all packages from "AWT" by "import java.awt.*;" statement.
//when I tried running by deleting "import java.awt.event.*;", the compiler gave error like "WindowAdapter not found" "ActionListener Not found",

Answer: No you haven't. import foo.*; imports all the *classes* in the foo package, it doesn't say anything about the foo.bar package. Packages aren't *actually* hierarchical in the JVM's eyes - we just organise them in hierarchies to make them easier to deal with.
--
John S.

Q: Java debugging questions...

1. I m trying to use java_g / jdb pair in the windows environment. I couldn't find java_g in JDK 1.2 package. Was it replaced with something else (java -Xdebug ???)

2. I don't get any output when I do a Runtime.traceMethodCalls(true). I was expecting all the function calls to be traced. Does this mean that the JDK 1.2 doesn't support this on windows?

3. To refresh my memory on remote debugging.
a) Compile the code using javac -debug
b) Run the class using java_g
c) Attach the jdb from teh remote machine.

Did I miss something?

Answer: I think they changed this at some point. I currently:

1) Compile everything using: javac -g
2) Run using:
java -Xdebug
-Xrunjdwp:transport=dt_socket,server=y,suspend=n,address=8000
YourClassName
3) Debug using:
jdb -connect hostname:8000

--
Peter

Q: We are developing our first Java application, and we encountered some problems with the Java memory management.

The operating system that we are using is mainly Windows (98, NT, 2K) but we are also planning to use Linux.

The problem with the memory is the following: our java application "eats" memory from the operating system, but the memory is never released. We are sure that our objects get garbage collected, but beside that, the java virtual machine keeps the memory.

We searched the web for documentation, and the ones that we founded are bad news for us! The docs said that this is the normal operation of the virtual machine!!!

Please, tell me that I'm wrong and that the problem can be solved...

Answer: That's the usual behaviour of the JVM. The only possibility I detected to release memory to the operating system (checked with Windows NT + JRE 1.3) is to call the JVM with "java -Xincgc" and call System.gc() frequently.

If your problem is that you want to launch several applications you should consider running them all in one JVM.

Make sure you are not subclassing java.lang.Thread without actually running the threads -- this has been a known memory-eater.
Also, remember that any object in a Vector, Hashtable, etc. is "rooted" as long as its 'container' is...

There are some tools you can use to determine what kind of objects are being created, and what the heap looks like. A simple version is shipped with the JDK that is invoked with
java -Xrunhprof:<options>

Run java -Xrunhprof:help for details...
--
answers by Joern, Blair Wyman

Q: Does anyone know how I would go about mirroring a certain directory to another one using Java?

I want to do this in real time, so effectively when I'm copying a file into the first directory I want a copy to be created in the second simultaneously.

Answer: There is a Java program that synchronizes directories on a computer or on separate computers over a network.

http://www.kcmultimedia.com/jcase/
JCase is a tool that synchronizes directories on a computer or on separate computers over a network. It is intended for such chores as keeping a common directory current between a laptop and desktop computer. Windows users especially, will find JCase to be a faster, more reliable and more configurable alternative to the Windows Briefcase.
Although Java is a cross-platform language, JCase 1.0 will only be able to synchronize directories in compatible file systems. You will not be able to synchronize a Windows directory with a UNIX directory or vice versa. You will be able to synchronize two Windows directories or two UNIX directories.
--

John

Q: I am trying to do some profiling and need to know that at the end of my program, how many objects of a particular class have been Garbage collected.

How can I do this?

Answer: Well you could use a decent profiler.....

One way is also to add a static int to each object type you want to follow and increment it whenever the constructor is called, that way you get a count of the number of objects made(Which ultimately is near on the same as those collected as long as you don't have references being held all over the place).
If you necessarily need to know how many objects that have been garbage collected rather than created, move the increment to the finalize() method.
Do something like this:

```
class A {
   static int count;
   // ...
   // fields and methods
   // ...
   public void finalize() {
       count++;
   }
}
```

But keep in mind that finalize() might never be called, even if the object is GCd. You only know that finalize() will be called before the memory is reused.
--
Paul, Igor, Roger

Q: Hi, I'm looking into different profilers / memory / thread analyzers for Java and I'm wondering if any of you have had experience with any of them (love em / hate em). I'm looking for something that can profile well "locally" but also profile an application running under a web server servlet / JSP engine (specifically, IPlanet Web Server 4.1, possibly moving to 6.x later).

Experiences, thoughts, or feedback from vendors as well are welcome, and thanks.
--
John

Answer 1: I use JProbe's Profiler, version 2.8. It includes memory and performance profiling. I use it strictly for local profiling. I have found it to be very helpful in identifying both types of bottlenecks. It takes some time to learn how to use it optimally, but once you get the hang of it, the tool can be very helpful. I have not explored other products, primarily because at the moment we are still stuck at JDK 1.1.5. JProbe version 2.8 supports 1.1.7 and 1.1.8 as well as Java 2. JProbe 3.0 is actually out now but no longer supports JDK 1.1.x (at least there sales rep recommended that I not upgrade).

My biggest critique of JProbe is their documentation and have told them as much whenever I speak with a sales rep. If you fiddle with it long enough you can figure out what information is being presented in any given GUI window and how to make sense of it. But the application suffers from the classic weakness among insufficiently documented software: it has at least a sentence or more describing most GUI components, but fails to really put it all together effectively into a document that effectively communicates how to use it (maybe they think you'll buy some training or tech support that way; I don't know).
--
Brian

Answer 2: Since I've been looking at two other products I thought I'd offer my thoughts on them so far for the benefit of those watching the thread:

1) DevPartner (NuMega): Really handy, debugs down to the windows kernel api level on windows. Excellent summary statistics at the end of a run, but not really good graphical display (that I've found yet at least) during a run. Excellent "drill into your source" capabilities and an oustanding display of "percent of allocations come from where".
Speedy "C-like" interface, and NuMega has excellent Windows products (BoundsChecker, etc) so I'm inclined to like them for that reason.
Downside: Each profiling tool is separate, with no integrated view of the whole thing.
RemoteAgent failed to install on IPlanet box on first couple of attempts; need to try it with all applications shut down. This was disheartening. Had one nasty system-bye-bye NT crash bug at one point, so shows its "kernel debugger" roots in that respect; didn't happen a second time though. Nice support for profiling apps from the command line easily.

2) OptimizeIt. (VMGear) Easy and robust integration with IPlanet web server, which we needed in our environment, though the "uninstall" to IPlanet functionality could have been added as well.
Nice graphical display at runtime, some features only available then such as code drill-down (though a snapshot might make them available at other times -- haven't tried it). An API interface for turning it on and off -- cool, but haven't yet exercised it.
Possibly able to use in production environment, but need to look into this feature more to see if it's available with IPlanet or simply for use on command-line type apps. Somewhat intuitive docs, though the API documentation could stand more description.
Some ugly Swing UI bugs running under Win98;
haven't tried them on NT -- these can be worked around but are annoying. Set-up of new projects somewhat more intuitive than DevPartner's, though DevPartner allows for easier and seemingly more extensive tweaking (including direct command line editing) once project is already set up.
Would like to see more summary information (total bytes allocated over the course of a run, etc), and jeesh fix the swing bugs. But a good job overall.
--
John Lockwood

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Networking

Q: I have difficulty understanding what is the difference between sockets and ports. They seem to be doing the same thing, receiving/sending data streams to other computers over network.

Answer: A port is a software address on a computer on the network--for instance, the News server is a piece of software that is normally addressed through port 119, the POP server through port 110, the SMTP server through port 25, and so on. A socket is a communication path to a port. When you want your program to communicate over the network, you have give it a way of addressing the port, and this is done by creating a socket and attaching it to the port.
basically, socket = IP + ports
Sockets provide acces to the port+ip

Q: Could you give me an example how to generate TCP/IP packets? I need to write my first network program.

Answer: There is no need to write such program. Java hides this implementation from you. Just use java.net.Socket or java.net.ServerSocket class and use appropriate constructor.
Easy and fast!
If you want even faster, use the method setTcpNoDelay(true) :-)
--
AP (J.A.)

Q: We were trying to write a mail client using sun's javamail. I was wondering if there is a

way to set the priority of the message.
Commercial mail clients does this by setting the X-priority:<num> field of the smtp header (1 means highest and 5 means lowest - I think the rfc allows much more than this). Looking at the documentation I could not find any way. I was wondering if any of you have done anything similar.

Answer: Look at MimeBodyPart::addHeader(String name, String value);

You can add any headers allowed by the RFC spec. :-)

Q: ServerSocket or DatagramSocket? What is better to use in my applications?

Answer: Both of them are good. It depends on task you do.
DatagramSocket is designed for UDP and ServerSocket for TCP. TCP is more reliable in terms that it ensures delivery, UDP not. But UDP packets are much smaller and have no such big headers like TCP packets have.
If it is smaller then there is more probability that it arrives faster. UDP used mostly in areas where you do no mind about retransmission. You just do not need this, because information become obsolete. Sound, for example.
It is better to make small pause or repeat last packet than to play some piece that was send first but received second.
It is up to you to take decision. If you do not mind that can lose small piece of data - use UDP. Otherwise use TCP.
--
AP. (J.A.)

Q: Why Java networking classes has no Ping method? It is number one utility!

Answer: I have no answer to this question. Probably because it uses some native interfaces.
The good news is that solution already exists and it is free.
You can take free implementation from our site here:
http://www.javafaq.nu/java/examples/files/pingicmp.zip
The program is written by programmed by M Isabel Garcia and Oscar Fernandez.

Q: How can I send/receive SMS messages via GSM phone with Java?

Answer: Use Kvanttisms - Java class library. The library contains classes for encoding/decoding SMS messages in PDU format and communicating with a GSM terminal through a serial link.
This library is distributed under Apache Software license, so you will not have problems to use in most of cases.
Take it here:
http://sourceforge.net/projects/kvanttisms/
--
AP. (J.A.)

Q: Is it possible to ping an email address? I need to validate entries made on an order entry form, and as part of the validation process I would not only like to validate the formatting of the email address, put also if the address to authentic.

Answer: No, it is not. If it were possible, spammers could use this to detect valid E-mail addresses en masse. A loop could be written that would detect all active AOL E-mail addresses over a period of days.
You can easily "validate" an E-mail address as to its form, even sometimes ping the domain at the right of the address (but not always), but you cannot verify that the E-mail address is real without actually posting a message to it. This is why so many E-commerce sites do just that.

In the past there were some UNIX network services that listed all valid E-mail addresses on a server, but they have largely been discontinued for the same reason -- abuse.
--
Paul Lutus, www.arachnoid.com

Q: I wrote small network program using TCP socket. I see that often it does send immediately the data I am trying to send. I have heard that it is because of "nagling". What does it mean - nagling?

Answer: "Nagling" is network transmission algorithm named after John Nagle. This algorithm specified a means of dealing with what he called the small packet problem. This problem arises when we try to send for example one character over the net.
Sending of just one byte causes adding additionally ~40 bytes to packet header. So if we send one page of text with small packets it can cause incredible traffic. Overheading will be 4000 % compare to real data.
John Nagle algorithm avoids such trouble and sends packets when they become big enough. In some applications you want to send one byte anyway, for example if you have heart beat that supervise your connection. To disable "nagling" use setTcpNoDelay(true) from java.net.Socket
--
AP. (J.A.)

Q: can someone please post a snippet of Java source code that will issue a ping to a specified IP and either return whether successful or not, or round trip time.

Answer: A solution related to that has been posted a few days ago, an alternative way works for me via Runtime.getRuntime():

```
import java.io.*;

import java.net.*;

class Ping {
  public static void main(String[] args) {
    BufferedReader in = null;
    try {
      Runtime r = Runtime.getRuntime();
```

```
        Process p = r.exec("ping 62.2.78.245");
        if (p == null) {
          System.out.println("Could not connect");
        }
        in = new BufferedReader(new InputStreamReader(p.getInputStream()));
        String line;
        while ((line = in.readLine()) != null) {
          System.out.println(line);
        }
        in.close();
      } catch (IOException io) {
        System.err.println(io.toString());
      }
    }
}
```

--
Linda

Q: I need telnet implemented in Java. I found a few packages on the net. Which is best?

Answer: It is difficult to say which really best one is until you run for years and get all troubles. I like the implementation from Matthias L. Jugel and Marcus Mei•ner because it supports SSH. It is very important! Ordinary telnet connection exposes everything to any person who uses simplest network tools.
SSH provides secure connection. This library is free and available under GNU General Public License.
--
Leo

Q: I am trying socket level programming through firewalls. Could somebody tell what Http tunnelling is and how to achieve that using Java 2?

Answer: As an aside, how do you request your proxy server to fetch a page from the net?

http://developer.java.sun.com/developer/technicalArticles/InnerWorkings/Burrowing/index.html

Q: How can I let dial a phone number with a modem in a Java app.? Is there a way without a System.exec() call and without any M$ classes?

Answer: You could use javax.comm to do it manually via the serial port and the good old AT command set on the modem. Alternatively, you might look at JTAPI, but that might have its own problems and a lot of overkill.

Q: Does it possible to have two thread running at the same time which reads from the same socket. If a message is received, does both threads then receive it?

Answer: Two threads can read data from the same socket input stream, but they WON'T each get copies of the same data. They'll each get separate parts of the message.

Q: how can I get an IP Adress in the class InetAdress? The constructor is private, so I can't use it. I want to call the method getName () to get the domain name out of an IP Adress.

Answer: It is not necessary to construct something :-)
Just do it like this:
for example: String hostname = InetAddress.getLocalHost().getHostName();

Q: I'm converting an old java client/server program which is based on raw byte stream heavily into new one which requires utilizing object streams. But if I open input/output object streams on both sides this blocks system and won't proceed...

Hi,
I'm converting an old java client/server program which is based on raw byte stream heavily into new one which requires utilizing object streams. But if I open input/output object streams on both side this blocks system and won't proceed.

ObjectInputStream in = new ObjectInputStream(socket.getInputStream());
ObjectOutputStream out = new
ObjectOutputStream(socket.getOutputStream());

Answer: Upon opening the ObjectInputStream, the constructor blocks to read a header from the stream (doing who-knows-what). Now, what happens is, both your client and server open the InputStream... and happily wait forever for the other side to send them the header they want. Deadlock guaranteed!
The solution is simple: open the ObjectOutputStream first on at least one side, but better on both sides (usually, symmetry == good). Problem solved
:)
You are trying to keep two streams going at once independently, right.
That means you need at least two threads at each end.

Q: Are there classes available to read and write to an RS 232 port or does this require using native code?

Answer: See the Java Communications API.

Q: Is there a System property that'll tell me the (TCP/IP) machine name? If not, how do you go about it?

I need to display all the machine's TCP/IP addresses to the user. This requires a call to InetAddress.getAllByName(), which requires the machine name. You *can't* pass null or "localhost" to this method. Well, you can pass "localhost", but that only gets you the localhost addy itself-

127.0.0.1. Not useful.

Answer: Try this: Working that out, I tried

```
String hostname = InetAddress.getLocalHost().getHostName();
System.out.println(hostname);
InetAddress[] ads = InetAddress.getAllByName(hostname);
for (int i=0; i<ads.length; i++) {
    System.out.println(ads[i]);
}
```

by Michiel

Q: Hi, I am new to JTapi (java telephony). I am trying to run a sample code provided with the JTAPI specification. However I get an error message such as :

Can't get Provider:
javax.telephony.JtapiPeerUnavailableException: JtapiPeer: DefaultJtapiPeer could not be instantiated.

Answer:
As with many Java packages (most notably JDBC) java.telephony is only an API -there is nothing behind it.

You have to pay someone for an implementation.

The point is that if you use the API then it will run with anyone's implementation.

Q: Is there any way to connect through the proxy?

I'm connected to the web behind a proxy. When i try to connect to servers outside they time out and give an exception.
Is there any way to connect through the proxy?

Answer: Try this at the command prompt:

```
java -Dhttp.proxySet=true -Dhttp.proxyHost=<ProxyHostNameHere>
-Dhttp.proxyPort=<ProxyPortNameHere> <myclass>
```

<ProxyHostNameHere> is to be replaced by the proxy host.
<ProxyPortNameHere> is to be replaced by a proxy port number (i.e. 8080)
<myclass> is the java class that you are running.

You can also set these function through the System class. Check the API for setting properties.
Hope that works.
--
Dan

Q: Socket - My problem is the main class that spawned these threads cannot kill the thread if it's blocked in a read.

I'm making a program that launches some threads that connect to the net and do some stuff.
I'm using a blocking read (TCP/IP BufferedReader.readLine) because I've been recommended by a few people that it was the better way to do it.
My problem is the main class that spawned these threads cannot kill the thread if it's blocked in a read.
Is there a thread function I could use? I tried use BufferedReader.ready() to make my read not blocking
(BufferedReader.ready() returns true only if the the stream is readable otherwise loop so there is no actual blocking) but my problem with that was that BufferedReader.ready() doesn't throw an exception if the other side disconnects so I'm left looping infinitely. I'm really stuck here so if anyone can give me a strategy (I don't need it spelled out to me just general "I used this function type help) I'd really appreciate it.

Answer 1: I've found the only way to unblock a (Socket) read-blocking thread is to close() the socket from another thread. That'll throw an IOException in the read() call.
--
Michiel

Answer 2: Another method that seems to work is to set a socket timeout to something moderately short (like 10 seconds). The blocked read will throw an exception when the timeout occurs. Then the thread can inspect the state of a variable (set by another thread calling an appropriate method) to see if it should terminate.
This approach also makes it trivial to implement a longer inactivity timeout if desired and gives the network thread an opportunity to do some maintenance work if it wants.
--
Peter

Q: I get the impression that only read operations from a Sockets InputStream throw an Exception if the opposite Socket has closed the socket. Writing to the Socket's outputStream works fine...
Is there a way to detect if what I write into a Socket's outputstream is actually still being received by the other side?
Or will I have to check that I actually get a response via the InputStream, and if not, try to open a new Socket and resend the request again?

Answer: You can try calling flush() after writing the output, but there's no guarantee that you'll get an immediate exception. The underlying TCP/IP software may go through timeout and retry logic before giving up.
That's probably why you'll usually find out about a broken socket when waiting to read. You should rewrite client so that it sends a request and waits for a response. If it doesn't get a response, it should try to make a new connection and do the request/response thing again.
If it doesn't work the second time, it should give up for the time being. Perhaps it really makes sense that one has to verify 'by hand' that requests go through.
--

Duane Morse

Q: ... I imagine, I'll have to cut my file into small datagrams.

I just made a little chat program (client and server) and I would like to add the possibility to transfer files.
The client and the server are communicating with TCP/IP using a socket.
I imagine, I'll have to cut my file into small datagrams. Is it necessary ? Has someone an idea or a link to source code of such a function ??

Answer: No. If you were using UDP/IP (DatagramSocket and friends) then it would need to be split up. The point of TCP is to avoid this need. Simple send the entire file in a stream.

Q: I would like to send a large amount of data through a Java socket. I currently use the following (pseudocode):

```
out = BufferedOutputStream(socketOS, 8092)
loop{
data = byte[100000]
out.write(data)
}
```

My network connection can send 1 MB in about 5 seconds via FTP, etc., but the above process takes over a minute to send 1 MB.
Is there a way to even come close to my connection's capabilities?

Answer: Once of the main problems with this buffered stream, is that its write method is synchronized. As we all know, synchronized methods can take up to 6 times longer than normal methods to execute. For this reason might I suggest taking the source for BufferedOutputStream, taking out the synchronization, and recompiling as a new class? I would guess this would increase time considerably. Give it a try!
More: one of the unoptimized points is the memory-allocation...
data =byte[100000]... in the loop.
This means, each transferred byte is allocated in memory. That's very bad (very slow)!!!!
--
Chris Shorrock http://www.tantalus.com

Q: Tomcat and packages...
I'm a bit confused about how packages should be organized in Java.
If I work for mycorp, should my classes go into a package named com.mycorp.myapp?
If I do, it seems I must recreate this directory structure in Tomcat in order to use the classes: webapps/myapp/WEB-INF/classes/com/mycorp/myapp ?

Answer: Correct. When you state e.g. package org.foo.cool; in a java source file the compiled file must reside in a directory structure that mirrors this:
org/foo/cool (your source files should/must also reside in a similar directory structure)

The CLASSPATH must be set to the top directory of the packages.
To start an application whose main method is in the org.foo.cool.CoolApp class place the sources in e.g.
/home/foo/javaapps/org/foo/cool/ and start the app with
java -classpath /home/foo/java org.foo.cool.CoolApp
(actually java -classpath /home/foo/java org/foo/cool/CoolApp also works)
--
Nils O. Selasdal

Q: Where can get the more JSP source?

Answer: try

http://www.jspin.com/

http://jsptags.com/

http://www.jsptut.com/Getfamiliar.html

Q: our project is currently serializing a lot of stuff. The aim was/is to be able to start up quicker when you (only?) had to de-serialize, instead of initializing all those objects.

My question: is this really a start up time winner or the opposite?

Answer: My experience with serialization is limited, precisely because it took so much time to deserialize - and so I abandoned using it.

Well, the only way to tell for sure is to try it both ways and see which one is faster.

If I had to guess, I'd say object initialization is faster. But I don't know what you code does to initialize its objects.
Does it just set some fields to default values? Or does it set its fields to values returned from a website accessed over a 9600 baud modem? It makes a difference.

If you want your program to start up fast, the way to do that is:

1) Write your program in the most straightforward way, not thinking about performance until it's done and feature complete.

2) Check to see if it's fast enough. If so, stop.

3) If not, use a performance-measuring tool to see where it's spending its start up time; optimize those routines.

Any other methodology is invalid, in that it is as likely to slow your app as speed it. (I'd guess that's what you did.)
--

Marshall Spight

Q: I've tried in every possible way I could find to determine my actual internet IP address with Java. It just doesn't work. My computer is connected through a router that connects to my ISP. This causes the InetAddress.get* methods to return only an intranet ip address.

InetAddress.getAllByName("<router ip address>") doesn't work either, it returns the intranet address of the router.

Answer: If you can't see "your" IP address using getAllByName(), then it is not "your" IP.

If the following code cannot resolve your Internet IP address, then you don't have a direct connection to the Internet:

```
// NetTest.java

import java.net.*;

class NetTest {

   public static void main(String args[]){
      try {
         String hostName = InetAddress.getLocalHost().getHostName();
         InetAddress[] ipList = InetAddress.getAllByName(hostName);
         System.out.println(hostName + ":");
         for(int i = 0;i < ipList.length;i++) {
            System.out.println(ipList[i].getHostAddress());
         }
      }
      catch(Exception e) {
         e.printStackTrace();
      }
   }
}
```

My example run:

```
pl-alpha:
192.168.0.2
228.232.218.126
```

The first is my fixed intranet address; the second is my temporary log-on address.

If the NetTest (getAllByName) is returning only private IPs for you (192.168.*, 10.*) it sounds like the router is providing NAT and Masquerading so that the PC doesn't really have a real IP address--it's like you're behind a firewall. There's no way for clients on the internet to reach your server.

On the other hand, if you can configure your router to forward packets on a particular port to your intranet address, then you can just bind to the local address and the rest will come out ok.
--

Paul Lutus
www.arachnoid.com

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or on the web:
http://www.javafaq.nu/plm2html/my_subscription.shtml

Operational Systems & Java

Q: Is anyone aware of any way to determine OS type, version...

Answer: There is in the java.lang.System
try first:

```
Properties p = System.getProperties();
System.out.println(p);
```

to see what properties you can get(CPU among others)..
you then can:

```
String prop = System.getProperty("aproperty(the CPU among other)");
```

Q: Does anyone know if there is an easy way to invoke UNIX shell scripts from a Java application.

Answer: There is!
execute a shell and then write the name of the shell script on the shells stdin stream.

```
Process child = rtime.exec("/bin/bash");
BufferedWriter outWriter = new BufferedWriter(new
OutputStreamWriter(child.getOutputStream()));
outWriter.writeLine("filename");
outWriter.flush();
```

Q: We need to authenticate a user on the local Linux system before he/she/it can log on to the application and begin taking over the world. Since the Linux system uses shadow passwords, we must have a method to retrieve the password and authenticate the user in the user shadow database. Once authenticated, this user can work with the application.
How it can be done in Java?

Answer: It can be done, it is already done!
Here if you are interested in interfacing C with Java in Linux (the JNI Solution):
http://cscene.org/CS4/CS4-04.html
--
John

Q: Is there a way to differentiate the enter key on the main keyboard from the enter key on the keypad?

Answer: I don't think so, they're both represented by the character code 10.

Q: Is there any way to manage Systray Icons with Java? I didn't even find anything in the Microsoft packages...

Answer: You must create a C/C++ program that call directly the NotifyIcon API to display/manage the Icon in the Systray. Then call the program from Java with JNI.

Q: Currently I'm running two operating systems on one machine, Windows 2000 and Windows ME...

Currently I'm running two operating systems on one machine, Windows 2000 and Windows ME.
Windows ME runs on default, Windows 2000 is on D drive and ME is on C drive. I tried to add the JDK directory to the classpath but there isn't a autoexec.bat on the D directory, but there is one for C.
Should I just create a autoexec.bat for D?

Answer: Go to Settings/Control Panel/System/Advanced/Environment Variables... and edit your CLASSPATH variable if exists or add a new one.

Q: I need to be able to run a shell script from java, by doing a host call to unix. I am currently trying 'Runtime.exec' to do this. It says it runs it, but doesn't actually successfully complete the command (which is a file delete).

I need to be able to run a shell script from java, by doing a host call to unix. I am currently trying 'Runtime.exec' to do this. It says it runs it, but doesn't actually successfully complete the command (which is a file delete).
A few questions I have about this:

1. Can I trace it or something to see why it isn't working?
2. How can I get the 'return code' from the shell script?
3. Will the java procedure wait for the shell script to execute, or does it run a seperate thread concurrently?

Answer: > 1. Can I trace it or something to see why it isn't working?

Runtime.exec() returns a Process object that you can get information from.

If the script is written with sh or some derivate thereof you can do 'set -x' in the script to trace its behaviour. For other scripting languages there is likely a similar mechanism. To see the trace in your Java program, read from the error or output streams of the process (Process.getErrorStream() or Process.getOutputStream()). It's possible that the script is already printing a message to its error stream that you aren't seeing, indicating why it isn't working.

Answer: > 2. How can I get the 'return code' from the shell script?

Call Process.exitValue().

Answer: > 3. Will the java procedure wait for the shell script to execute, or does it run a seperate thread concurrently?

The program runs concurrently in a separate *process*, not a thread within the JVM. To wait for the process to finish, call Process.waitFor().

Q: Are not-initializable classes and methods like System.out.println() and Math.random() "synchronized" ?

Answer: I think they are synchronized. Simple observation: did you ever see once that printout was broken into two pices by another printouts? I mean for example if you do:

In 1st thread: System.out.println("1234567890");
And in 2nd thread: System.out.println("something else here");

it never will be broken like:

12345
something else here
67890

Even if Sun didn't write about it explicitly, we can see that it is synchronized or at least behaves like synchronized that is the same for our real life.

Q: I have a little problem with the JVM (1.3) under Linux (SUSE 7.1). Every time I try to run a java application that includes a GUI, while the JVM starts I get a few warning messages saying that the JVM can't locate some fonts. The application continues to run but non of the

fonts included in my code are used, instead I get the same font in every part of the GUI.

Answer: I get the same response. This is because the fonts specified in the code are not resident in the place where the JVM looks for fonts. They may actually be on your Linux machine somewhere - there are hundreds of fonts available to X windows in Linux.

There are only 5 fonts which are guaranteed to be available in every java environment: Serif, SansSerif, Dialog, DialogInput, and Monspaced.
There are other fonts available to you on your system, of course. But the problem with using any fonts other than the guaranteed five is that you cannot be assured your user will have the fonts you have specified in you code, on his/her system.

Q: I want to know, if I have more than one CPU on my machine, is it possible to bind a JVM to a particular CPU?

Answer: That's operating-system dependent..... Java has no control over this.
For example, under Solaris, look at pbind(1M)...

Q: How can I pass a string to the command line(DOS) ? Also i want to capture the output given by the command line in a string.

Answer: Try this out:

```
// works for DOS
String cmds[] = new String[2];
cmds[0] = "dir"; // replace with "ls" on UNIX
cmds[1] = "c:"; // replace with "/" on UNIX

// execute the command
Process pro = Runtime.getRuntime().exec(cmds);
// wait until it's done executing
pro.waitFor();

// what did the process output from the Input pipe back to
// this process (okay, who named this stuff)?
InputStream out = pro.getInputStream();

// output it (really slowly)
int i;

while ((i = out.read()) != -1) System.out.println((char) i);
```

Q: How can I take a program that runs in a DOS shell and send the text that comes from the shell program into a Java program where it can analyzed, etc.?

Answer: From a command line, use a pipe (with the "|" symbol):

```
c:\> dosprogram | java JavaProgram
```

In the Java program, read the text from System.in:

```
public static void main(String[] args) throws IOException {
    int nLines = 0;
   BufferedReader in =
   new BufferedReader(
   new InputStreamReader( System.in));
   for (;;) {
      String line = in.readLine();
      if (line == null)
         break;
      nLines++;
      System.out.println(nLines + ":" + line);
  }
}
```

Q: If there is a way to run a java program by just typing the name in UNIX. I mean instead of typing for example "java Main" just type "Main" and run the program. And how to implement that in a makefile?

Answer: Write a script that runs the program and put it in your path. For instance:

```
#!/bin/sh
java BlahBlah
```

Call this whatever you want, mv it to your /usr/local/bin directory, then just type it at the command line and BlahBlah will be run.

Q: Are there any Java libraries for executing Linux commands?

Answer: Try java.lang.Runtime.exec(). E.g.

```
Runtime.getRuntime().exec("xterm");
```

Note if you want to use shell builtins or shell features like redirection you need a shell, e.g.:

```
Runtime.getRuntime().exec(new String[] {"/bin/sh",
                          "-c", "ls / 2>&1 | tee ls.log"});
```

Q: I'd like to know how to know which operating system java application is running on.

Answer: You could try using the system Properties.
e.g.

```
Properties prop = System.getProperties();
```

```
String osString = prop.getProperty( "os.name" );
```

Q: I would like to know how my Java program can catch when someone sends a "kill" to my app in Unix or does a Ctrl-C in windows?

In Unix there is atexit() function that handles this type of situation. Is this possible in Java ?

Answer: Starting with 1.3 there is Runtime.addShutdownHook(). This is for cleanup only. from API: "A shutdown hook is simply an initialized but unstarted thread. When the virtual machine begins its shutdown sequence it will start all registered shutdown hooks in some unspecified order and let them run concurrently. When all the hooks have finished it will then run all uninvoked finalizers if finalization-on-exit has been enabled.
Finally, the virtual machine will halt. Note that daemon threads will continue to run during the shutdown sequence, as will non-daemon threads if shutdown was initiated by invoking the exit method. Once the shutdown sequence has begun it can be stopped only by invoking the halt method, which forcibly terminates the virtual machine.
Once the shutdown sequence has begun it is impossible to register a new shutdown hook or de-register a previously-registered hook. Attempting either of these operations will cause an IllegalStateException to be thrown.
Shutdown hooks should also finish their work quickly. When a program invokes exit the expectation is that the virtual machine will promptly shut down and exit. When the virtual machine is terminated due to user logoff or system shutdown the underlying operating system may only allow a fixed amount of time in which to shut down and exit. It is therefore inadvisable to attempt any user interaction or to perform a long-running computation in a shutdown hook." more read here: http://java.sun.com/j2se/1.3/docs/api/index.html

Q: Is it possible for a minimized window in MS Windows task bar to start blinking? In any IRC client a minimized window starts blinking when a new message appears in it. Is it possible in Java?

Answer: I doubt very much that it is possible with pure java; you would have to use some native code to achieve that. Maybe what you could try though, is to play around with the icon used in the title bar of the frame. I haven't tried this myself - and in any case I'm running linux, but it might be possible to have two icons and to switch them around at some rate using the Frame.setIconImage(Image) method. This will only affect the icon itself - not the whole window, but it's better than nothing.
--
Allen Wallis

Q: How do I find the list of all system properties?

Answer: do smth like this:

```
Enumeration list = System.getProperties().propertyNames();
   while(list.hasMoreElements()){
      System.out.println((String) list.nextElement());
```

```
   }
}
```

Q: Is it cls-like command in DOS (CMD) window? I would like to clean the screen the user sees?

Answer: Unfortunately there is no command as "cls", but try this instead:

```
for    (int i=0; i<25; i++)  System.out.println();
```

It will print 25 empty lines and they will move current printouts up

Q: Why my program does not give the address of the local machine on one PC and give on another?

Answer: As long as you have TCP/IP installed, you should at least get 127.0.0.1

Q: Can applet corrupt my registry file?

I have written a java applet for displaying my genealogy. It has worked fine at home. My brother tested it on my web site with no problems. BUT, the third person I asked to take a look at it reported, that though it worked fine, when he exited the page, his system locked up and he had to reboot. After the reboot he said his registry was corrupted and had to be restored.

Has anyone seen anything like this? if so, do you have any suggestions as to probable cause and fix?

Answer: Any time you don't shutdown properly, your registry can be corrupted, even if the program that did the freezing was not even using the registry.

The registry is one of the stupidest ideas ever conceived in computer science. It puts ALL your eggs in one basket.
by Roedy Green
For the JAVA GLOSSARY see http://mindprod.com/jgloss.html

Q: Does anybody know how to find out the complete path of a system default browser (if there's such) from a Java stand alone app?

Answer: Under Windows you can 'invoke' the default browser calling
'start filename.html', under Unix is a lot more complicated because nobody can assure you that a browser exists and the user is under X....
--
Davide

Q: ...The problem is that, after the file is uploaded to the server, every end of line is placed with ^M character...

I have written a servlet which uploads a file from client(Win32) to server (Unix). I have used DataInputStream to read the file in bytes and FileOutputStream to write the file to the location in the server.

The problem is that, after the file is uploaded to the server, every end of line is placed with ^M character. This problem is faced only when I upload to Unix Server from Windows O/S.

Answer: This is normal, I think. A line ends with a single return symbol in Unix and ends with a return symbol and a switching line symbol in Windows. The editor in Unix shows "^M" when it meets the switching line symbol.
So to fix this bug, you can remove the switching line symbol in the end of lines when you upload files from Windows to Unix.
Or Use a BufferedReader to read the source file (line by line) and a BufferedWriter to write the destination file. That way the source line separators will be discarded and the correct separators (according to the target OS) will be used.
If you only have an InputStream to start with, use InputStreamReader to convert it to a reader.
--
Jorge

Q: I have a server written in Java that I would like to start up as a NT service...does anyone know how to do this?

Answer: Check this site:
http://www.kcmultimedia.com/smaster/

I read there:
"ServiceInstaller is a FREE utility that makes it easy to install programs as Windows NT Services, including pure Java applications, without manually editing the registry!"

Q: Does any one know how to kill or stop a process through java?

Answer: It must be a process you created, and there are rare occasions when this will not work.

Process p = Runtime.getRuntime().exec(path);

```
// later ...

p.destroy();

--
```
Paul Lutus, www.arachnoid.com

Q: I'd like to determine the free disk space in a platform independent way. So far, I've found no Java way to do so...

The best I've been able to come up with is running the UNIX "df" utility (which is available for a number of non-UNIX platforms, too, such as Win32 and OS/2).

Answer: Samizdat Productions Releases JConfig 2.1.1 JConfig is a class library that extends the core Java API. It lets you work with files, web browsers, processes, file types, and other system-level items in a much more advanced manner than that provided by the standard Java class libraries. A list of JConfig's features is given below.

JConfig is free for most freeware and educational projects, and it now comes with the complete Java and C++ source code!

** Download JConfig here:
http://www.tolstoy.com/samizdat/jconfig.html
Here's a partial list of JConfig's features, by category:
Files:
Enumerate the user's disk drives, and obtain extended information on files, directories, volumes, and filesystems: their icons, creation dates, version information, mount points, and more...
Web Browsers:
Launch a file or URL in the user's Web browser...
Video Monitors:
Enumerate and get information on the user's video monitors: bit depth, bounds, and more...
External Processes:
Create external processes, send basic commands to external processes, obtain the PSN or HWND of a process you created, and enumerate the currently running processes...
File Types:
Find applications associated with a given file type, find applications by name, and convert between Windows file extensions and Mac creator/file type codes...
--
boruvek

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http://www.javafaq.nu/plm2html/my_subscription.shtml

Servlets & Servers

Q: The first thing is that i don't know how to do to create Servlets ... no more precisely, I don't know how to compile it !!

It says that it doesn't find the packages (javax I think) ...
Plz, could someone tell me exactly what I should put on my environment variables (Class_path, path, java_home etc...)

Answer: Well, I also started to learn about servlets. I recently downloaded JDK1.3.0 and Apache Tomcat 3.1.0 .
I set the following paths.

CLASSPATH = %TOMCAT_HOME%\webapps\examples\WEB-INF\classes\work;
(my working directory)
TOMCAT_HOME = C:\JDK\tomcat;
(or wherever you installed tomcat)
PATH=%TOMCAT_HOME%\bin ;
appended tomcat bin path to the path statement)

I also copied the servlet.jar found in the tomcat bin directory to both:

C:\jdk\jre\lib\ext\
C:\Program Files\JavaSoft\JRE\1.3\lib\ext\

I hope this helps....

Gregory Pedder

Q: I do not see constructors in servlets? Am I missing something? How can servlet run without constructor?

Answer: There is no need to use constructor in servlets for you because servlet are similar to applet in a way it is running. The creation of servlet instance is a Server responsibility. You just need to use init() method.
This method called first when servlet is loaded into servlet container...
--
AP (J.A.)

Q: Where can I find online books about servlets?

Answer: I have on the site free books link collection. Doing search for "servlet" I got 5 books. Please check here:
http://www.javafaq.nu/indexu/search.php4?keyword=servlet
--
John

Q: When can I use System.exit() in servlets?

Answer: Never! Depends on server you run on... Security exceptions on good server or full shut down for simpler one.
--
John

Q: Why Servlets are better than CGI scripts?

Answer: Generally, every new client's request to CGI script starting a new process. With servlet web server starts just a new thread that is much cheaper in terms of time for starting up, memory and CPU consumption.
JVM uses just one process.
This answer is right for "standard" CGI. Now appear new modules for Perl that uses the same approach as servlet does. Anyway, writing large programs on Java is much easier than on Perl, at least for me.
Java has also very rich API.
--
John

Q: I was writing and testing some servlet program. Now I decided to remove it from our web server.
But it is still there causing confusion to another developers I am working with.
How can I unload my servlet explicitly?

Answer: It depends on server you use. Often you can unregister your servlet somehow.

Easier way to make your servlet empty (remove all code), compile it and copy class file to server.
Many servers reload automatically a new class if they see it was changed. You will still have your servlet on the server but it will do nothing and nobody will complain...
--
Peter

Q: Any simple server I can download to run my java servlets...

Answer:
Try Resin, www.caucho.com
Try tomcat from http://jakarta.apache.org - pure Java,
servlets 2.2, good stuff! Tomcat is good. It's not fast, but it's very easy to setup and good solution for development. Since most heay-duty servers do implement SUN specification, one can migrate application in no time.
--
DG

Jigsaw is also good but doesn't support the Servlet 2.2 spec

<URL:http://jigsaw.w3.org/>

Both of these are open source with BSD-like license.

There's also Jetty http://jetty.mortbay.com/ Artistic license, Servlet 2.2 spec compliant), GNU Paperclips
http://www.tapsellferrier.co.uk/gnupaperclips/ GPL, claims to be moving towards Servlet 2.3 spec compliance) and also
vqServer http://www.vqsoft.com/vq/server/ which is free but not open source.

Finally many of the commercial servers can be downloaded free for trial periods.
--
Simon Brooke http://www.jasmine.org.uk/~simon

Q: Can someone point me to some tutorial/example/text book that covers the subject of receiving on a server side a file upload from a browser sent as with content-type set to multipart/form-data.
Thanks.

Answer: There are free Java classes that will do this for you. Here's one I wrote:

http://users.boone.net/wbrameld/multipartformdata/
If you still want to write your own, you can use mine as an example.

or here:
http://www.servlets.com/cos/index.html
There you can download package which contains also examples, how to do it.
--

Walter Brameld

Q: How can I get access to Cookie set at the Client?

Answer: The following code should access a cookie on a client. It reads in all the cookies on the machine. And checks there name for whichever one you are looking for.

```
Cookie[] cookies = request.getCookies();
for(int i=0; i < cookies.length; i++) {
   Cookie thisCookie = cookies[i];
   if (thisCookie.getName().equals("Cookiename")) {
         // Do whatever you want with the cookie....
   } else {
       // cookie doesn't exist...
   }
}
```

The Cookie class is in package javax.servlet.http.Cookie

Q: I'd like to provide to the showDocument() method of an applet the URL of a CGI program...

I'd like to provide to the showDocument() method of an applet the URL of a CGI program with including a certain number of (URL-encoded) parameters to this URL (which is the same as doing a GET HTTP request).
What is the maximum size I can give to this URL ?

Answer: If I remember exactly it something around 240 for many servers. Maybe less, but not more!!!
1000000%
I read it last year in "Java Servlet Programming" from O'Reily.

Q: I am experimenting a Java server application. This program has worked well

It did start on the Red Hat Linux 6.0 server, but it does not open the socket, in other words, it cannot communicate with the client applet on the Linux. On this Linux server I have installed every components and all of them were running at the experiment time. Why does this server application communicate with the client applet only on the Linux? Does anyone give me a suggestion?

Answer: Take a look at your port number. If it is under 1024, it is a protected port number and non-privileged users cannot touch it on Linux or any other Unix-system.

Q:Where Can I find a server to try my servlets?

I am creating a client/server application. I don't run my own server

and my ISP won't allow me to install and run applications from their server.
Does anyone know of anywhere (preferably FREE) that will allow me to use server side Java? Any help is GREATLY appreciated.

Answer: http://www.mycgiserver.com/

Q: Hi, I am using servlets. I need to store an object NOT a string in a cookie. Is that possible? The helpfile says BASE64 encoding is suggested for use with binary values. How can I do that???

Answer: You could serialize the object into a ByteArrayOutputStream and then Base64 encode the resulting byte []. Keep in mind the size limitations of a cookie and the overhead of transporting it back and forth between the browser and the server.
Limitations are:

* at most 300 cookies

* at most 4096 bytes per cookie (as measured by the characters that comprise the cookie non-terminal in the syntax description of the Set-Cookie2 header, and as received in the Set-Cookie2 header)

* at most 20 cookies per unique host or domain name

For more details please refer to RFC 2965.

Q: Hi, I want to send a POST request, but I can't find such functionality in the servlet API, how can I do this? Must I implement this with a socket connection to port 80?

Answer: A servlet can do anything a standalone Java application can do. It doesn't need anything beyond what the java.net package already provides. You can use an httpURLConnection to POST to a server program like a servlet or CGI script:

```
// Create a string with the parms you want to post  and convert it to a byte array. You may need to
// pass the values through java.net.URLEncoder.encodeURL()
// if they have embedded blanks or special characters

String parms = "a=10" + "&b=20" + "&c=30";
byte[] bytes = parms.getBytes();

// Create a URL pointing to the servlet or CGI script and open an HttpURLConnection on that URL

URL url = new URL(TARGET_URL);
HttpURLConnection con = (HttpURLConnection) url.openConnection();

// Indicate that you will be doing input and output, that the method is POST, and that the content
// length is the length of the byte array
```

```
con.setDoOutput(true);
con.setDoInput(true);
con.setRequestMethod("POST");
con.setRequestProperty("Content-length", String.valueOf(bytes.length));

// Write the parameters to the URL output stream

OutputStream out = con.getOutputStream();
out.write(bytes);
out.flush();
// Read the response
BufferedReader in = new BufferedReader(
            new InputStreamReader(con.getInputStream()));
  while (true) {
     String line = in.readLine();
     if (line == null) break;
     System.out.println(line);
  }
in.close();
out.close();
con.disconnect();
```

--
Phil Hanna
Author of Instant Java Servlets
http://www.philhanna.com

Q: I am writing an application, using Java Servlets, which requires me to set and read cookies. It works okay, but fails if I set the domain of the cookie to something other than the current server.

I am writing an application, using Java Servlets, which requires me to set and read cookies. Using the servlet API, and the javax.servlet.http.Cookie class.
I created a new cookie, and added it to the http response, using its addCookie() method. It works okay, but fails if I use the setDomain method, on the newly created cookie, to set the domain of the cookie to something other than the current server.

Answer: I suspect that is not a legal operation for any browser to
accept a cookie that has a domain inconsistent with the source
of the cookie.
by William Brogden

Q: I am working on weblogic server 5.1 with MsSQLSERVER7 i am able to load the driver but it says unable to get socket connection

I am working on weblogic server 5.1 with MsSQLSERVER7 i am able to load the driver but it

says unable to get socket connection.It says connect to the MSSQLSERVER's host and port no.
How do I get these name and value.

Answer: The MS Sql Server's host is usually the name or ip of the server that run SQL Server, if you know the IP (ping <nameoftheserver>), put the IP in it, it will be faster, for the Port number, sincerely I don't
remember the standard port, but look into the SQL Server documentation and you will find it.
by Davide

Q: Whenever I compile my servlets it always says "can't find package javax.*" even though I downloaded the JSDK. Where the JSDK files so it'll find that package?

Answer: There are no classes in the javax.* package. There are classes in javax.servlet.* and javax.servlet.http.*, but neither are really related to javax.* -- importing javax.* won't affect them. You should import the packages that you really want to use!

Q: I have a list of html links on a web page, and I want to be able to call a servlet based on what the user clicked on...

I used:

<a href=/servlet/SomeServlet">

for each link, and I want the servlet to display information based on what the user clicked on. If the user click on an applet link, I want the Servlet to print, "You just clicked on an applet", etc.

My question is, how do I send information to a servlet, based on what html link the user clicked on? I know i can use getParamaterValue() for getting information off of forms, but I'm not sure how to do this with html tags.

Answer: Change the link to:

<A href="/servlet/SomeServlet?click=apple">link</A>

In the servlet, use request.getParameter("click") to retrieve the value.

Give each link a unique "click" value and that will tell you what was clicked.
B Russell

Q: I'm looking for a Java HTTP server framework that can be used and modified for a project I'm going to be working on.

My boss asked me what the equivalent in Java was that IIS was in the Windows world or Apache was in the UNIX. I've looked at Jigsaw, but am wondering if anyone out there knows of other resources...open source would be great. Thanks in advance for any input.

Answer: There are other pure Java web servers, like the Apache PicoServer,
Jetty (http://www.jetty.org ???). Perhaps you could take one of those to write a http block for the Apache Server Framework avalon (http://java.apache.org/framework)
Another tip is to search sourceforge for web servers.
http://www.sourceforge.net
--
Glen Shelly

Q: I am currently running Microsoft's IIS server. I have the Java Virtual machine installed on this system. What else will I need to run my servlet. Do need the Apache web server instead? Will IIS support Java servlet?

Answer: You will need a Servlet Engine to run your servlets.
You can use either Allaire's JRun (http://www.jrun.com) or Tomcat (http://jakarta.apache.org).
Both of them work with IIS.
--
Madhusudhanan Challur

Q: How can I avoid browser caching?

In an applet, I call the function showDocument to send a GET message to one of my servlets, which sends me back a PDF file dynamically generated by this servlet.
My problem is : the browser (in this case IE) always sends me back a PDF file with the same content.

Answer 1: There are a few possibilities to avoid this problem.
A simple workaround is to add a random number URL variable with the request, such as "ranx" with a value of the milliseconds since midnight. This will make the request unique and, hence, avoid browser caching.
by Duane Morse

Answer 2: There are two other response setHeader attributes you can set:

```
response.setHeader("pragma", "no-cache");
response.setHeader("Cache-Control", "no-cache");
response.setDateHeader("Expires", 0 )
```

Just in case.
Doug Schwartz

Answer 3: // for Answer 1 and 2 please go to yesterday's tip.
When you generate the PDF file, make sure you set the header to tell the browser that the file will expire at a certain time. The browser should not cache the response past the given time. The Java code looks something like
this:

```
import java.text.SimpleDateFormat;
import java.util.Date;

SimpleDateFormat dateFormat
= new SimpleDateFormat("EEE, dd MMM yyyy - HH:mm:ss z");

response.setHeader("Expires", dateFormat.format(new Date()));
```

The format of the date is very particular.

Scott Gartner

Q: Wich free software can I use to debug Servlets?

Answer: What you need to do is use Jakarta-Tomcat to run your servlets. Then, bring in all the tomcat jars into your "required libraries".
Then set up your "project run" to actually run the Tomcat class. If you run it in debug mode, you should be able to put breakpoints in your servlets.

We did this at a project I was on with weblogic and EJBs, and Jbuilder 4 does it with tomcat, so I'm assuming you can do this as well.\
--
Trever M. Shick
http://xjr.sourceforge.net
http://velocidoc.sourceforge.net
http://www.objectwave.com
http://www.geocities.com/trevershick

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Threads

Q: Can anyone please explain the difference between the two types: green threads and native threads?

Answer: Green threads is thread mechanism implemented in JVM itself. It is blind and can run on any OS, so actually all threads are run in one native thread and scheduling is up to JVM. This is disadvantageously for SMP systems, since only one processor can serve Java application.

Native threads is a mechanism based on OS threading mechanism. This allows to use features of hardware and OS. For example,there is IBM's JDK for AIX that supports native threads. The perfomance of applications can be highly imploved by this.

Q: I use myThread.isAlive() method to test that thread is still alive. But sometime even if it indicates that some thread is still running I am getting errors when try to use that thread. What is wrong?

Answer: the method is Alive makes you sure that thread actually "was" not "is" alive at the moment when you used it. I think it could be better if SUN rename it to wasAlive() and did not confuse people. This method just checks once when you use it and does not keep eye on what happens after.
Probably the thread will exit right after that.
The method activeCount() does the same: it counts all running threads. This information becomes obsolete immediately next moment!

enumerate() method is another example.
All those methods are useful only for statistic collection, nothing else. Avoid using them for other purposes!
To know when the thread exits use join() method.
--
AP (J.A.)

Q: What are Thread Groups useful for? I do not see big reason to have them in Java API...

Answer: From the beginning Thread Groups were added for security reasons. Assumed, that not trusted code from third parties will run in dedicated Thread Group. Of course it can not affect the rest of program. Those threads from external companies were not allowed to start, stop and suspend your threads. Then this model is changed and we have no such protection now.
Now the Thread Groups will let you a little bit easier manage your threads. You can manage many threads simultaneously rather than each separately. For example you can set maximum priority level, call suspend(), interrupt() on all threads in your group. Also giving good names will help you to easily track and debug your program.

M.

Q: What was wrong with stop() method for threads? Why did SUN deprecate it? I really need it...

Answer: stop() method was very cruel. It stopped the thread without giving any possibility to save the data.
It was not possible to predict when it will be applied. Even using finally method could not help - stop() interrupted it as well.
Really it is still possible to use it. Simple solution:

use boolean variable, for example:
boolean letStop;
and add two functions - prepareForStop() and doMyStop().

Method prepareForStop() must save all your data and make sure that you run all your code in thread, then set letStop to true.
Method doMyStop() will call stop() if only letStop value is true, otherwise do nothing (or inform you and you call prepareForStop()).
Keep in mind that stop() is deprecated.
--
AP (J.A.)

Q: I tried to use destroy() method on my thread. But nothing happens! I double checked my code and sure it is Ok. What is problem?

Answer: The problem is that SUN did not implement this method. So, it exists, but does not destroy anything. Why?

Sun says that if you use such powerful method your program will crash/hang later, maybe even sooner. I believe to it because they left stop() method even, although in deprecated form, but not destroy().
--
E

Q: I know that exist Win32 and POSIX threads. Are Java threads different on different OSs? How can it affect my program?

Answer: Although Java designed to run on different OSs it does not mean that your program will run in the same way, especially if you have threads.
The problem is that Java runs on some OS, not Java OS. And underlying OS implementation is different on different OSs. UNIX uses POSIX threads - Portable Operating System Interface. This is standard for UNIX and approved by IEEE. Microsoft as usually made it "slightly" different that causes standard incompatibility - Win32 threads.
And implementation is different. For example, on Windows you have just limited number of priority levels, I do not remember how many, but it was something ~10-20. In UNIX - thousands!
So, if your program uses priority comparison of threads, let say priority 23453 and priority 23454 then it will be no difference on Windows. Be aware about it.
--
AP (J.S.)

Q: I read this statement: “The main thread must be the last thread to finish execution. When the main thread stops, the program terminates.”
Is it true?

Answer: Absolutely wrong!
The correct one:
When you start a program, JVM creates one thread to run your program. The JVM creates one user thread for running a program. This thread is called main thread.
The main method of the class is called from the main thread. If program spawns new threads from the main thread it does stop until last thread id died. Even if the main thread dies program keep running.

Q: I move from C to Java now. My friend says that I still do my programming in an old way since do not use threads. But I do not see any reason to use them in my program. Could you advice where I should use them and why?

Answer: You are right! Having threads functionality in Java does not mean that you MUST use them.
A lot of programs work better without any threads. For example, editors, calculators.
Some programs run better and more reliable if they are multithreaded, for example servers, programs with repetitive, independent tasks. The final decision of course will be done by you.
Multithreaded programs much more difficult to debug, avoid dead lock situation. Because threads are running often independently you can not predict exactly what happens in your program right now. Often multithreaded programs behave differently each time you start them

and it is difficult to repeat problem exactly when you debug your program. So, if you have simple logic, possibly no need to run multiple tasks - try to avoid the thread usage.
--
JA

Q: Why suspend() and resume() methods were deprecated?

Answer: These two functions were included into API with purpose to let do Garbage Collecting (GC) and debugging.
For these two task the usage of suspend() and resume() is meaningful. But for all other things they are real disaster because suspended thread can work as a controlling thread and hold a lock. Suspending of this thread can cause hanging of program and really can be used effectively. That's why they were deprecated.
But you can still use them if you sure that do right thing. Nobody knows how long SUN is going to keep deprecated methods and classes. Quite possible that they never will be removed.
--
AP (J.A.)

Q: Is it true that ThreadDeath exception was "secret" and accidentally exposed to public?

Answer: Yes it is true. The original implementation was not intended to show it to us. But due to some mistakes of SUN programmers it got out and now it is a part of API.
Warning: "An application should catch instances of this class only if it must clean up after being terminated asynchronously. If ThreadDeath is caught by a method, it is important that it be rethrown so that the thread actually dies." from API reference for java.lang.ThreadDeath.
--
AP (J.A.)

Q: I know how to start thread - to run run() method... But seems there is no exit() method. How do I stop my thread? Will it run forever?

Answer: Nothing can be run forever :-). In Java there is no exit() method. It was made intentionally. The idea was that thread will exit when run method returns. So, when you reach return in your run method - your thread will exit and die.
If you need to keep your thread working you do not let it reach the return :-)
--
AP (J.A.)

Q: When should I use a daemon thread? Why would I use one instead of a regular thread? What is the purpose of daemon threads?

Answer: Any Java thread can be a daemon thread. Daemon threads are service providers for other threads or objects running in the same process as the daemon thread. For example, the HotJava browser has a daemon thread, named Background Image Reader, that reads images from the file system or the network for any object or thread that needs an image.
Daemon threads are typically independent threads within an application that provide services

for other objects within that same application. The run() method for a daemon thread is typically an infinite loop that waits for a service request.

When the only remaining threads in a process are daemon threads, the interpreter exits. This makes sense because when there are only daemon threads remaining, there is no other thread for which a daemon thread can provide a service.

To specify that a thread is a daemon thread call the setDaemon() method with a boolean parameter that is true. To determine if a thread is a daemon thread use the accessor method isDaemon().

Q: Hi, Is there somebody who can tell me why my thread sleeps longer then I told him to do...

I have a thread that has to sleep for 60000 millesec. But every 4, 5 minutes
it sleeps for 61000 millesec.? I have to built an application that get the
time every minute, but with this sleep I can't trust the java threads.

So can somebody tell me what is going wrong???

Answer: Really JDK never give you warranty that will wake your thread after XXX ms.
You can be sure only
that your thread will not be waked up before!

For good timing you should take another, better for real time perfomance, VM.
For example PERC from Nemonics.com or something else...

Q: I would like to ask a question about garbage collection of Thread Object.

When will a Thread Object be garbaged collected?
When the reference count to it becomes zero, or when it enters the "Dead" state, i.e. the run() member function terminates?

Answer, part1: Since Thread is also an Object, it will only garbage collected when the reference count is zero. You may think it is quite non-sense. the thread is useless when it enter "dead" state. why not garbage collect it?
That's because the thread object itself may contain some other useful information even the thread dead , e.g. the result of the execution of the thread. Thus, it is not sensible to do garbage collect when the reference count is not zero.
--
Anthon
P.S. Important ad! Except when object A holds a reference only to object B and object B holds a reference only to object A. Both reference counts are non-zero, but both objects are eligible for garbage collection. Which is why few, if any, modern VMs use reference counting to determine eligibility for garbage collection.

Jim

Answer, Part 2: You can consider a Thread object as a normal Object for garbage collection purposes if you consider this one rule: A running thread will not be garbage collected.
That is, a normal running thread is a root object, so the Garbage Collector will not attempt to mark it for collection. When the thread is not running, though, normal Garbage Collection rules apply (i.e. total # references == 0 then collect).

To get a thread with different behavior,
see the Thread.setDaemon(boolean bState) method.
--Brian

Q: I was until recently using the MS version of the Java API and I was using Thread.stop() when I switched to SUN I see it is deprecated.

I understand why, in fact it was causing a problem that has been solved by taking it out.
However, I do need to halt the thread from running without making it sleep.
How can I do this?

Answer: One simple way to kill a thread is to have a boolean stop variable
with a method to set it to true, like so:

```
endThread(){
  stop = true;
}

run(){
    while(!stop){
          //all run code goes here
    }
}
```

If the rest of your code is okay with the last loop finishing before run() ends and the Thread dies, this works great as it is simple and can't cause any bad states. If not you can add more conditional statements just before you would affect something your stopped thread shouldn't. After a certain point adding conditionals would become too inefficient and I'm sure there's a solution to that but I don't want to figure it out right now.
--
Ben

Q: How to overcome failures in threads?

How can I monitor multiple threads? I need to find what my threads do.
I have found thread.isalive() but I have a pool of threads and they are always alive. What I need is more specific info.

I have also found thread.getclass() but I didn't understand how to use it.

For example, if I write:

```
public class test implements Runnable .....{
   private int data;
   public int getData() { return data; }
}
```

Is it possible to use:

```
test test1 = (test)Thread.currentThread().getClass(); ?
```

I have multiple threads and I need to create a model which can handle the problems with threads. For example if one thread fails I need to interrupt that thread and complete its work.

Answer: Try to use such kind of inspecting pattern:

A. you have an inspector class Inspector which extends Thread and has a method:

```
public void
handleProblem(ObjectContainingAllInformationsAboutTheProblem o) {
   // here you get the information about the problem
   // from the object o and use them to handle this
   // problem.
}
```

B. You have a Pool of thread objects MyThread each of them implementing two methods :

```
public void inspect(Inspector i) {
   if (thereIsAProblem) {
      i.handleProblem(new
      ObjectContainingAllInformationsAboutTheProblem(...))
   }
}
```

C. Your main program creates an instance of Inspector and informs it about the thread pool (gives it a reference to the pool) and starts Inspectors thread.

D. In its run() method, Inspector will periodically inspect all MyThread objects calling a method such as the following :

```
private void inspectAll() {
   // threadPool is the reference to the TreadPool...
   for (int i=0 ; i < threadPool.numberOfThreads ; i++) {
      threadPool.getThread(i).inspect(this);
   }
}
```

Well, I hope it helps you :-)

Anyway you can extends the inspectors interface to gather more information and to be able to monitor your threads in the way you want and when you want (if you don't inspect the Threads you don't get any information)

--

Michel

Q: Anyone know how I can stop a thread without using the deprecated stop() method?

Normally I would just have a "while(alive) {...}" loop, and some "stop()
{alive = false;}" method.
However, this time all the thread does is call one method, which it sits in until it finishes, and I want to stop it in certain situations. The method isn't one I've written, so I can't alter that.

Answer: I always construct my threads so they can be killed at any time. An outline of the code (this is just a sketch) is the following.

```
Mumble mumble = new Mumble(args);
Thread t = new Thread(mumble);
t.setDaemon(true);
t.start();


private class Mumble implements Runnable {
   private Thingy args = null;

   public Mumble(Thingy args) {
      this.args = args;
   }

   public void run() {
      try {
         process();
      }
      catch (InterruptedException e) {
         // cleanup processing and fall through to method end
      }
   }

   private void process() {
      while(true) {
         // do something with args
      }
  }
}
```

Note that calling interrupt() on a Thread doesn't just instantly generate an InterruptedException.

The interrupt does happen instantly because the thread calling it is executing, not the thread executing the process() (unless you are on a multi-processor machine in which case this may not be true). The point of having interrupt() is to be able to stop something like a long running method to complete.

The only very difficult problem lies in blocking I/O operations, which do not throw

InterruptedException and probably should. Blocking I/O will block until either the underlying stream is closed or the operation is complete... so be careful about using large blocking I/O operations for cancellable I/O.
--
Allan Wax

Q: I want to have a program that does something every 5 seconds. Is there a method called pause(5000) or wait(5000)?

The point is that I don't want to create a thread simply for this purpose.
Thread.sleep() can have the current thread sleep/idle for certain period of time, but can the job be done without threading?

Answer: You can use Thread.sleep(5000) without creating a new Thread object because the method is static. You can look at the example below:

```
public class TestSleep {
   public static void main ( String args[] ) {
      System.out.println( "Starting" );
      for ( int i = 1; i < 101; i++ ) {
         System.out.print( i + "\t" );
         if ( i % 10 == 0 ) {
            System.out.print( "\n" );
            try {
               Thread.sleep(1000);
            }
            catch( java.lang.InterruptedException Ie ) {
               Ie.printStackTrace();
            }
         }
      }
   }
}
```

--
Mikkel Bundgaard

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Sound & Multimedia

Do you know that Version 1.3 of the JavaTM 2 Platform
includes a powerful new API for capturing, processing, and
playing back audio and MIDI (Musical Intstrument Digital Interface) data.
You can read here more: http://java.sun.com/j2se/1.3/docs/guide/sound/index.html

I'm doing a small console java app, and want to know what the function is to make the pc speaker beep....

Answer: Toolkit.getDefaultToolkit().beep();

Q: I would like to burn a CD from within my code, that way I won't have to waste so much time making illegal copies of music. Is there a convenient way to do this in Java?

Answer: Unfortunately Java doesn't provide any API for this :-)

Q: Just wondering if Java has classes and methods supporting joysticks? Is there any sample code working with joysticks some where?

Answer: Sure it does. It's part of the Java 3D API. There is an InputDevice interface. It is described as follows:

"InputDevice is the interface through which Java 3D and Java 3D application programs communicate with a device driver. All input devices that Java 3D uses must implement the InputDevice interface and be registered with Java 3D via a call to PhysicalEnvironment.addInputDevice(InputDevice). An input device transfers information to the Java 3D implementation and Java 3D applications by writing transform information to sensors that the device driver has created and manages. The driver can update its sensor information each time the pollAndProcessInput method is called."

The trick is finding a driver. :)

http://sourceforge.net/projects/j3djoystick/
http://www.j3d.org/utilities/sensors.html

Jim S.

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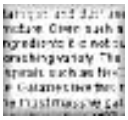

String, text, numbers, I/O I part

Q: What is difference between:

String My = "Test";
and
String My = new String ("My"); ?

Answer: Because the compiler automatically creates a new String object for every literal string it encounters, you can use a literal string to initialize a String.
String s = "Test";

The above construct is equivalent to, but more efficient than, this one, which ends up creating two Strings instead of one:
String s = new String("Test");

The compiler creates the first string when it encounters the literal string "Test", and the second one when it encounters new String.

source: http://java.sun.com/docs/books/tutorial/java/data/stringsAndJavac.html

Advice: If you are C/C++ programmer be careful with shortcut assignment operator "+=" in Java when you work with Strings!

Why: The shortcut assignment operator += when used with Strings may confuse C and C++ programmers at first. Recall that a += b is equivalent to a = a + b. Let's look at two code

samples written in C++ and the Java programming language:

```
//C++ code
string* s1 = new string("hello");
string* s2 = s1;
(*s1) += " world";
cout<<*s1<<endl<<*s2<<endl;
return 0;
//s1 = s2 = "hello world"

//Java programming language code
String s1 = "hello";
String s2 = s1;
s1 += " world";
System.out.println(s1 + "\n" + s2);
//s1 = "hello world" and s2 = "hello"
```

In the C++ example, the strings s1 and s2 print the same result because they both point to the same address. In the Java programming language, Strings can't be modified, so the + operator must create a new String when "world" is appended to s1.

source: http://java.sun.com/docs/books/tutorial/java/data/stringsAndJavac.html

Q: Why the String does not have a capacity method?

Answer: The String class doesn't have a capacity method, because a string cannot be changed.

Q: When do I use String and when StringBuffer?

Answer: The Java platform provides two classes: String and StringBuffer that store and manipulate strings-character data consisting of more than one character. The String class provides for strings whose value will not change. For example, if you write a method that requires string data and the method is not going to modify the string in any way, pass a String object into the method. The StringBuffer class provides for strings that will be modified; you use string buffers when you know that the value of the character data will change. You typically use string buffers for constructing character data dynamically: for example, when reading text data from a file. Because strings are constants, they are more efficient to use than are string buffers and can be shared. So it's important to use strings when you can.

source: http://java.sun.com/docs/books/tutorial/java/data/whytwo.html

Q: Why do I get different results here:

```
System.out.println(2 + 2 + "=result");
System.out.println("result=" + 2 + 2);
```

In the first case I get:
4=result
and in the second one:
result=22

Answer: Because Java uses "left to right" principle.
In the first case Java sums up two integers: 2+2=4 and then converts it to a string: 4=result
In the second case Java takes string "result" then converts 2 to a string, concatenates them together.
Then this process repeats with next number... Finally we get: result=22

Q: I need to detect whether a user enters a capitalized letter. I'm using the following code so far:

```
// The keyboard
BufferedReader br =
new BufferedReader(new InputStreamReader(System.in));

String input = null;
do{
  try {
    input = br.readLine();
  } catch (IOException ioe) {
  System.out.println("IO error");
  System.exit(1);
}

//check input for uppercase characters (ignore the
//fact that it might be numbers, assume valid input)
...
```

I have searched the API, in particular, the string function for a way to do this but no luck.

Answer: Try this:

```
if(input.equals(input.toLowerCase)) {
  // no upper case letters
  // (untested code)
}
```

Additionally, if you need to test individual characters, char comparisons are perfectly fine.

```
char blah = 'a';
if(blah >= 'A' && blah <= 'Z'){} // if the char is uppercase then...
```

--
Jeff

P.S If you want that code works for all languages, not only English use please do it like this:
`if (Character.isUpperCase(blah)) { ... }`

--
Dr. Harald M. Muller
Senior Consultant - OO, Java, SW-Architecture
Cortex Brainware, WWW: http://www.cortex-brainware.de

Q: An idea for validating the phone number field on a form..,

Does anyone have an idea for validating the phone number field on a form. I am looking for something that will basically check this input mask

*111*111*1111*

Where the 1's are number's and the *'s are either - . spaces, or any
other character like (). Please advise.

Answer 1: You could use a regular expression package. For example, Jakarta ORO:
http://jakarta.apache.org/oro/

Answer 2: i'm thinking regular expressions. See:
http://www.cacas.org/java/gnu/regexp/
http://www.crocodile.org/~sts/Rex/

Q: Could someone show me a basic File I/O example? I just can't figure out streams. I'm willing to accept basic mockery in exchange...

Could someone show me a basic File I/O example? I just can't figure out streams. I'm willing to accept basic mockery in exchange...

Answer:

```
import java.io.*;

public class FileIO {

   public static void main(String[] args) throws Exception {
     if(args.length!=1){
        System.out.println("Invalid parameters!!!");
        System.exit(0);
     }
     File fl = new File(args[0]);
     FileReader fileReader = new FileReader(fl);
     BufferedReader bufferedReader = new BufferedReader(fileReader);
     String currentLine;
     while( (currentLine = bufferedReader.readLine()) != null ){
        System.out.println(currentLine);
     }
  }
}
```

Q: Does anybody know a convenient way to pause the dos program execution until user hits enter? In C I used getc. Does Java have an equivalent of "cin>>"?

Answer:

```
try {
   System.in.read()
} catch (Exception e) {
}
```

Have fun!
--
Bary

Q: I've got a (simple) menu on a new application and am trying to put in the works behind the cut, copy & paste menu options - does anyone know how I can do this - what's the code or can you point me in the right direction?

Answer: Look at java.awt.datatransfer package. It contains much of the tools necessary to implement cut. copy, paste.

Can anyone please explain clearly how BufferedReader works and how to use it to get input from a keyboard?

Q: How do I encode the value of a variable of type long (or int) into bytes? And how do I restore the original value of the long (or int) variable back

How do I encode the value of a variable of type long (or int) into bytes such that the number of bytes used will always be the same, say 4 bytes?

Answer:

```
int in; ...
byte b1 = (byte)(in & 0xff);
byte b2 = (byte)((in >> 8) & 0xff);
byte b3 = (byte)((in >> 16) & 0xff);
byte b4 = (byte)(in >>> 24);
```

: How do I restore the original value of the long (or int) variable back
: from the bytes that i have just created then?

Answer:

```
int in = (b1 & 0xff) | ((b2 << 8) & 0xff00) |
((b3 << 24) >>> 8) | (b4 << 24);
```

by Tim Tyler

Q: I would like to know if there was a method that replace a substring (in a string) by an

other one.

For ex: in the string: "toto=yes, tata=no", I want to replace "yes" by
"no", and "no" by "N/A",

Answer: There isn't a method to do it, since Strings are immutable, so you can't directly replace elements. (If you're doing a lot of string manipulation, shift the string to a StringBuffer.)
However, it's not hard to create a new string that performs the replacement, along the lines of:
int p = source.indexOf (target);
String result = source.substring (0, p) +
replacement + source.substring (p + target.length ())

In your example, beware of the order of replacement, since the second no will replace the first one.

Matt Humphrey

Q: I have a String containing multiple logical lines separated with "\r\n". I want to tokenize that string to individual lines.
However, StringTokenizer doesn't work the way I would like it to work with "empty" lines.

Example:
String str = "first line\r\n" +
"\r\n" +
"third line\r\n");

I would like StringTokenizer to tokenize the string to the following
three strings:
"first line"
""
"third line".

I have set "\r\n" to delim, but StringTokenizer.nextToken doesn't seem to return the second, empty line.
I also tried setting the returnDelims in StringTokenizer constructor to false, but then nextToken returns the "\r" and "\n" as seperate strings. It should return "", in order to make rest of my code to work OK.
How should I solve this problem?

Answer: There are several ways to get around this problem with utilities that I have written. The easiest way is to use a split function.
String[] stuff = StringHelper.split("first\r\n\r\nthird", "\r\n");
stuff will be a string array with 3 elements, including the empty line
in the middle. You can get StringHelper from:
http://ostermiller.org/utils/StringHelper.html

The second way is to use a StringTokenizer that returns empty tokens.

I have written a StringTokenizer that does such at:
http://ostermiller.org/utils/StringTokenizer.html
The only problem that you would run into is that StringTokenizer is a character tokenizer. So you would get extra empty tokens in between the \r and the \n.
--
Stephen

Q: I'm looking for a solution for parsing a String object. I need to parse a math expression and calculate it.

At first, I thought of StringTokenizer, but when I looked through the API document, multiple delimiters might not be allowed.
What is the best way to do this operation?

Answer: multiple delimiters _are_ allowed.
StringTokenizer st = new StringTokenizer(your_string, "+-/* ")
and so on.

Q: Are there any public domain matrix/linear algebra java packages out there?

I'm mainly interested in solving systems of equations and finding matrix inverses.

Answer: http://math.nist.gov/javanumerics/
The JavaNumerics page provides a focal point for information on numerical computing in Java.

Q: I am using the sinusoidal wave calculated by feeding a in function sin(a) values from zero to pi (3.142).I am wondering how is the Math.sin implemented in respect to effective calculating in practice:

Should I prepare a table with pre-calculated sine-values, or does java already have that table prepared for me?
If I 'pre-calculate' that table once, it'll make about 1024 sin-calculations plus all the lookups from the table (r, g, b + a values (4 * 255 values *4 transitions)).
Otherwise it's just the Math.sin-function call for the aforementioned RGB-values.

Answer: Most likely the JVM utilizes the floating point unit (FPU) of your microprocessor. The FPU is hard to beat these days in software. You could try a Taylor sequence, and Chebyshev approximations, but I doubt that you will be faster. On Intel, it is a hardware instruction. It is implemented internally as a polynomial approximation. You are best to treat it as a black box. Profile it.
If speed is a problem, pre-calculating a table is an option. It's the old trade-off memory vs. performance.
--
Thomas Weidenfeller

Q: Does anyone know how to write multi-line string in Java?

Answer: Something like this:

```
String a =
    "This is a
         multiline string.";
```

It is really pain to print HTML or XML from the Java program. Perl offer something like this:

```
print <<END_HTML;
  <html>
     <body>
       <h1>this is html.</h1>
     </body>
</html>
END_HTML;
```

Answer: Try this:
String a = "This is a\nmultiline string"

A "\n" stands for a line feed. Take a look at the Java language specification (downloadable on Sun's site), it has a section about strings.

Answer2: You mean like this?

```
String a = "<html>" +
                " <body>" +
                " <h1>this is html.</h1>" +
                " </body>" +
                "</html>";
```

I cannot find the method to convert a binary number to an int. I used Integer.toBinaryString to get a decimal to binary but I don't know how to to convert it back.

Answer: Try using Integer.parseInt(String s, int radix) with radix = 2
that should do your job.

Q: How do I launch a native Document by its Associated MIME Type? For example, I would like to ask the 'operating system' what application is associated with .DOC and then launch it.

Answer: On WinNt,

```
String docName = "c:\\someyourdir\\nameofdoc.doc";
Runtime.getRuntime().exec("cmd.exe /c "+docName);
```

Q: How do I indicate Unicode characters that cannot be represented in ASCII, such as ö?

Answer: from "Java Tutorial

(http://java.sun.com/docs/books/tutorial/i18n/text/convertintro.html)
"To indicate Unicode characters that cannot be represented in ASCII, such as o, we used the \uXXXX escape sequence. Each X in the escape sequence is a hexadecimal digit. The following example shows how to indicate the o character with an escape sequence:

String str = "\u00F6";
char c = '\u00F6';
Character letter = new Character ('\u00F6'); "

Q: When I tried to read one string representing boolean value and convert it into boolean it didn't work. Finally I found that Java API has a bug!

I wrote the program that uses redaing ini file settings for initialization. All settings in a file are strings. I am converting them to appropriate type during reading. When I tried to read one string representing boolean value and convert it into boolean it didn't work. Finally I found that Java API has a bag:

boolean x = true;
getBoolean(x);
will show false!!!!

Why Java has method that doesn't work? Is it bug in Java or I am stupid?

Answer: neither statement is true! It is not a bug and you are Ok! Just please read more carefully JavaDoc next time.
It is written there for getBoolean ():
"Returns is true if and only if the system property named by the argument exists and is equal to the string "true".
(Beginning with Java 1.0.2, the test of this string is case insensitive.)
A system property is accessible through getProperty, a method defined by the System class."

So you didn't use this method properly...
Use instead:

public static Boolean valueOf(String s)

This method returns the boolean value represented by the specified String. A new Boolean object is constructed. This Boolean contains the value true if the string argument is not null and is equal, ignoring case, to the string "true".

example:
boolean x= true;
(Boolean.valueOf(x)).booleanValue()
gives you proper boolean (not Boolean!) value

Q: Is there any Java API allowing creating easily PDF files (Adobe Acrobat type) including images?

Answer: No, just text
Etymon™ PJ is a developer toolkit for parsing, modifying, and creating PDF documents.
http://www.etymon.com/pj/index.html

Q: I'm working on a java project and looking for a better API that can generate PDF, work with Excel, Word documents... Where can I find it?

Answer:

- iTest

This library contains classes that generate documents in the Portable Document Format(PDF) and/or HTML

- XML->PDF

FOP is the world's first print formatter driven by XSL formatting objects. It is a Java application that reads a formatting object tree and then turns it into a PDF document. The formatting object tree, can be in the form of an XML document (output by an XSLT engine like XT or Xalan) or can be passed in memory as a DOM Document or (in the case of XT) SAX events.

- JPageLayout from Sitraka

JClass PageLayout provides sophisticated and easy-to-use APIs for adding text, images, and tables to any document. Output directly to the Java AWT Printer, Acrobat PDF, HTML, PostScript Level 2, or PCL 5. Customize almost every aspect of your report styles and print output for professional results.

Q: How can I extract text from PDF file?

Answer: I have used the Acrobat Viewer Bean (http://www.adobe.com/products/acrviewer/main.html) to extract text from PDFs. This bean is quite buggy but it was OK for this task. One drawback is that it depends on AWT even if you don't do anything GUIish with it, so if you want to use it on a Server with no X-Windows running you'll have to install the Pure Java AWT to get things running.
--
Patrick

Q: I'm looking for a rich text editor that I can embed within a web page, and allow users to enter rich text that I can in turn store as HTML.

I've seen similar applets through web based e-mail clients. I'd appreciate it if someone could point me in the right direction!

Answer:
Try Swing, by Robinson, Manning Publication. You could probably adjust the code to fit into the applet style.
It is here

http://javafaq.nu/java/free-swing-book/free-swing-book-chapter20.shtml

John

Q: I want to have a while loop execute for a maximum of n seconds or until it receives something in an input stream. How would I do this?

Answer: I think you could do it this way:

```
*****************************************
InputStream Input=null;
int n=10; /*Number of seconds to wait*/
/*initialize you input stream*/
...
/*Now start you while loop*/

long lStart = (new Date()).getTime();
long lCurrent = (new Date()).getTime();

while((lCurrent-lStart < n*1000) && (Input.available()==0)){
   Thread.currentThread.sleep(100); /* This will give JVM time to other threads */
   lCurrent = (new Date()).getTime();
}
*****************************************
```

You could simply count number of steps inside the loop keeping in mind that each step takes 100ms but I think using dates would be a bit more precise method.
Alex Shlega

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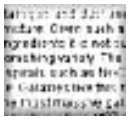

String, text, numbers, I/O II part

Q: How do I parse it to date and make a date difference?? How many days in between the String from and to?

I am always confusing with date and time.

I have 2 String, from and to
String from = "01.01.2001" //dd.MM.yyyy
String to = "01.03.2001" //dd.MM.yyyy

How do I parse it to date and make a date difference?? How many days in between the String from and to?

Answer:

```
import java.text.SimpleDateFormat;
import java.util.Date;
public class Tmp {
  public static void main( String argv[] ) throws Exception {
    long DAY = 24L * 60L * 60L * 1000L;
    SimpleDateFormat df = new SimpleDateFormat( "MM.dd.yyyy" );
    Date d1 = df.parse( "01.01.2001" );
    Date d2 = df.parse( "01.03.2001" );
    System.out.println( "The number days between:" );
    System.out.println( d1 );
    System.out.println( "and:" );
    System.out.println( d2 );
```

```
    System.out.println( "is: " + (( d2.getTime() - d1.getTime() ) / DAY ));
  }
}
```

But the calculation of the difference in times may not be suitable due to timezone issues and such. I believe there must be a better way?

Michael B. Allen

Q: I am looking for some code to compare current date and a date entered by user. I want to return years between dates. I can't find a method to do this with.

Answer: try GregorianCalendar class which is found in java.util.*

```
Calendar fdate= new GregorianCalendar(1999,1,25);
Calendar ldate= new GregorianCalendar(2000,1,25);
```

then use get methods and compare

```
fyear= fdate.get(Calendar.YEAR);
lyear= ldate.get(Calendar.YEAR);
```

Q: If I have a string with a hex value (e.g. "7FFFFF"), is there a way to obtain an int value from this (e.g. 8388607)?

Answer: See Integer.parseInt (String s, int radix). The radix for a hexadecimal number is 16.

Q: How do I convert this double to the following String:

```
double d = 19.969332079021637;
String s = "19.97";
```

Answer:

```
double d = 19.969332079021637;
DecimalFormat df = new DecimalFormat("##,###.##");
String s = df.format(d);
```

or

Use NumberFormat in the java.text package

```
...
double d = 19.969332079021637
NumberFormat format = NumberFormat.getInstance();
format.setMaximumFractionDigits(2);
format.setMinimumFractionDigits(2);
String s = format.format(d); // s="19.97"
```

Q: How do I convert a String to an integer. For example: String strSEQ = "SEQ7";

How do I pull "7" from the string and convert it to an integer?

Answer: I'd do something like this:

```
StringBuffer digits = new StringBuffer();
char c;
for (int i=0; i<strSEQ.length(); i++) {
  c = strSEQ.charAt(i);
  if (Character.isDigit(c))
     digits.append(c);

}
int intValue = Integer.parseInt(digits.toString());
```

--
Michiel

Q: How can I display other languages such as chinese, french, japanses etc. inside applet or frame?

Answer: You have to install the approriate font, and add it to a font.properties file. Further information can be found here:

http://forum.java.sun.com/read/16805306/q_CUP8NP-1rgAAYsA#LR
http://java.sun.com/products/jdk/1.1/docs/guide/intl/index.html
http://developer.java.sun.com/developer/qow/archive/65/index.html

Q: I need to determine the current year, at runtime, in the form of a four digit number, preferably in "int" form. How can I do this?

Answer: Hey, what makes you think that the year is a four digit number? It won't always be, you know. That's the kind of sloppy thinking that got us into that whole y2k mess, and we all know what a huge issue THAT turned out to be!

If you write your program assuming that the year is 4 digits, it will cease to function properly in less that 8000 years! Try not to have such a "short term" viewpoint.

Here's the deprecated solution:

```
int year = new java.util.Date().getYear() + 1900;
```

This was deprecated because it is too convenient! We programmers often get paid per line of code, you know.
Actually it was deprecated because it didn't have an implicit way to deal with time zones and it contains that silly Y2K problem.

The SUPERIOR way to do is as follows:

```
java.util.Calendar cal = Calendar.getInstance();
int year = cal.get(Calendar.YEAR);
```

--
Marshall

Q: I have a string like 23,N/A,,N/A,87, then I used the StringTokenizer t = new StringTokenizer(s, ",");

to get the token. I seems I only got 4 tokens back, not 5. How doesStringTokenizer treat the ,, in this case? I had tried String.equals("") or String.equals(null) to pick the EMPTY string between ,, , it did not work.
Anyone can give a clue?

Answer: There is another constructor, with a third parameter. Using that one, you can get the`boundary markers, such as the comma, returned to you as well. That would allow you to handle your empty strings.
--
Michele.

Q: How to know in Java if a given font has or not a fixed width ?

For example to list all the "fixed width" fonts that are available on the user's platform.

Answer: I'm not sure whether there's an easier solution... if there is none, you might try to get the FontMetrics objects from a specific Font. Then iterate over every character and call charWidth(char ch) on each. It should return the same value for each character if it's monospaced, different values for each one otherwise.

This might be a little "hacky", but if you really need an idea...

Karsten

Q: I want to create a Date object by just specifying the Year, Month and Day.

e.g. the user can enter 1998 as Year, 11 as Month of Nov, 15 as the day.
With these three information, how can i create a Date object (or similar object that stores the data)?

Answer: The correct way to do this is something like this:

```
Calendar cal = Calendar.getInstance();
cal.set(1998, Calendar.December, 15);
Date date = cal.getTime();
```

Q: I want to send Image through network. I made OutputStream to send Image...

OutputStream out = socket.getOutputStream();
but I can't send Image directly.
How can I send Image?

Answer: Unfortunately, the java.awt.Image class is abstract and is not serializable, otherwise this would be easy.

From the Java docs: "The abstract class Image is the superclass of all classes that represent graphical images. The image must be obtained in a platform-specific manner."

Consider using the Image.getSource method, getting the producer, getting the bytes, then send [width][height][bytes...].
--
Mark Watson, Java consulting, Open Source and Content: www.markwatson.com
Commercial software products: www.knowledgebooks.com

Q: I want to get the code behind an HTML page.

Answer:

```
URL url = new URL("http://www.sun.com");
BufferedReader reader;
reader = new BufferedReader(new InputStreamReader(url.openStream()));
String str;
while ((str = reader.readLine())!=null){
  // process str
}
```

Q: I am wondering if JDK supports to open a file in the exclusive mode?

Answer: No, file locking is not supported in current VMs. You can implement lockfiles, however, using the File.createNewFile() method. Since JDK 1.3:
"Atomically creates a new, empty file named by this abstract pathname if and only if a file with this name does not yet exist. The check for the ' existence of the file and the creation of the file if it does not exist are a single operation that is atomic with respect to all other filesystem activities that might affect the file. This method, in combination with the deleteOnExit() method, can therefore serve as the basis for a simple but reliable cooperative file-locking protocol."

Q: Does anyone know how I can get around the fact that a Message obj (from the JavaMail API) is not serializable?

I would like to save a message obj to the hd, then read the file (is 'file' the wrong word here?) back to my e-mail client and read it as a Message obj.

Answer: The obvious answer is: implement serializable yourself in a subclass!
But! That won't work. The serialization mechanism will throw an exception at runtime. Even if it didn't, the class may be nonserializable for a good reason, for example it might contain a

socket, which can't be reinitialized from a stream.

What you need is a subclass that implements the Externalizable interface, and then your own code that saves as serializable objects those attributes of the object that you need to reconstitute it later. I'm not familiar with this particular object, but I imagine it has several get() methods that return serializable objects like Strings or ints. What you have to do is recover those objects and put them into the output stream yourself, and reverse the process on unserialization. The fields that are not serializable you ignore.
You have to provide a no-argument constructor that reconstructs anything you aren't going to serialize (for example, opening a new socket). Read about the Externalizable interface for more details.
--
Frank LaRosa

Q: I wrote a little Java Tool that imports a 10 MB Text file. My Problem is that this text file has no line breaks, that means the whole file contains one record, which are all records put to one together.

With the readLine () method it takes more than an hour to complete my instruction.

How can I accelerate this process, I only need to insert a break line after each "record" (after x characters -> "\n").

Answer: If you will tell us what you are trying to accomplish, we may be able to offer a suggestion.

If you are trying to reformat the file to have line breaks, you will have to read the entire file once and write out a new file with the line breaks. It seems obvious that the original file was meant to be random-accessed and has fixed-length records, in which case it is just fine as it is -- if it is read appropriately.
--
Paul Lutus www.arachnoid.com

Q: How can you tell if an integer is odd or even?

I know an even number is divisible by 2 but I'm thinking then how can I detect
if a resulting number after dividing 2 ints has a remainder?

Answer: Basically the method is simple, if a variable contains an odd number
I want to return the value 'zero', and on the other hand if the
variable contains an even number I want to return the value 'one'.

Check out the % (modulus) operator, it computes the remainder.

```
public int modMethod(int div){
    if(div%2==0){
       return 1;
   } else{
```

```
      return 0;
  }
}
```

Q: I'm looking for an algorithm that would compress a large integer down to a not-that-long string. Actually, it's not an integer, but a series of integers that could have hundreds of digits in total.

Answer: Use classes ZipInputStream and ZipOutputStream. They are meant for exactly this purpose. And they meet the requirement of portability between languages (because ZIP compression is ubiquitous).
--
Paul

Q: How can I round a number to specified precision?

I have a double field that I would like to round to 2 places of precision, however, it seems like the documentation on the round function only rounds to closest integers. So that I would not be able say .3658585859 = .37 as I would like.

Answer: can you scale the number up and then down again when you are finished?
e.g. 0.3658585859 * 100 = 36.58585859
round(36.58585859) = 37
37 / 100 = 0.37

Q: I understand that bitwise operations change the 0/1 bits of a number. Question is why?

I suppose it's interesting that you can manipulate numbers this way, but I can't think of a practical use for doing that.

Can anyone help me understand when are bitwise operations used and why you would use them?

Answer: Bitwise manipulation is often used where memory consumption is critical, and a piece of information may be encoded in less that one byte, for instance. In communication software and protocols, information may be interpreted as a stream of bits where the information is encoded at the bit-level, and you use bitwise manipulation to extract the pieces of information encoded in the bytes. There are other situations where bitwise manipulation is used, as well.
by Greger Ohlson

Q: Why cannot I cast from double to java.lang.Object?

I'm trying to build a vector, however, one of the objects that I'm passing to the vector is of type double. How do I cast the double as an object so that I may insert the value into a vector? Does this make sense? Here is the following snippet of code I was trying to use:

myVector.add (1, (Object)myDouble);

Of course when I try to compile I get the following message:

Invalid cast from double to java.lang.Object

Could someone please explain why? I realize that Object is the mother of all objects and therefore ANY reference data type "is an" Object. So therefore I shouldn't have to cast the double, right? Help, I'm a beginner!

Answer: A double is not a reference type, but a primitive one. Hence, it doesn't inherit from Object (or anything else, for that matter). To put primitives (byte, short, int, long, float, double, boolean, char) into something that requires an Object, use Java's wrapper classes.

The wrapper classes are Double, Integer, Long, Boolean, etc., and are basically an object "wrapped" around a primitive type. You make a Double object by:
Double d = new Double (myDouble);

and to get the actual value back,

double z = d.doubleValue();

It works the same way for all the rest of the primitive/wrapper pairs.
by Trevor Hill

Q: is there a mod (x, y) function that returns the remainder when x is divided by y? Something equivalent to fmod(x,y) in C?

Answer: a = x%y;

Q: I'm having trouble figuring out how to convert characters to their ASCII value in java. Is there a class like NumberFormat that will do it?

Answer: I can't see any problem here:

char ch = 'A'; // character 'A'
int i = (int)ch; // ASCII value for 'A' (=>65)
Yes. And just be aware that ASCII only runs from 0 through 127. Anything higher needs to be addressed differently, since Java is using Unicode values.

Q: How to do "Press any key to continue"? I want to do it at Console.

Answer: // ReadConsole.java

import java.io.*;

public class ReadConsole {

```
   public static void main(String args[]) throws IOException {
      System.out.print("Press Enter to continue: ");
      System.in.read();
   }
}
```

You cannot have "press any key" from the console, for various system-dependent reasons. You need to press Enter.

--
Paul Lutus www.arachnoid.com

Q: Just wondering how people generally convert BufferedOutputStream into a BufferedInputStream to be read from....

This seems really stupid, but I can't find a way to do it in the API....

Answer: if you want to just take what's coming in and send it out then do something like this

```
BufferedInputStream in = new BufferedInputStream(some inputstream);
BufferedOutputStream out = new BufferedOutputStream(some outputstream);

int i = 0;

while((i = in.read()) != -1){
out.write(i);
}
```

of course you will have to handle exceptions, but that should be the general way to do it.
--
michael

Q: I have heard that String concatenation operator + affects performance of program if it used much. Is it true?

Answer: Yes, it affects your program performance if you do a lot of "+" operations with strings:
A new StringBuffer must be created, then two arguments are added to it with append(), and the final result must be converted back with a toString().
Your time and space is wasted...
In case if you are appending more than one String, try to use a StringBuffer directly.
--
Alexandre P. (J.A.)

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330 Java Tips

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About this e-book

This book is my collection of numerous advices, tips I have collected on numerous Java forums, newsgroups and my site. Here also many answers from my letters to people that asked me questions by e-mail.

This book is a result of my daily work during last few years. All answers can be found somewhere on Internet, but it takes much time to find them. Having all of them in one place, in the form of e-book, saves you hundreds hours.

The answers are in form of advices, tips. This book for "researcher" kind of people, who can manage to overcome obstacles without asking always full receipt.
That's why this book, I think, will be very useful not only for beginners but for advanced programmers as well.

Many questions in this book are not frequently asked and furthermore, easily answered even by Java Gurus.

They will show you that Java has many advantages that are not so obvious during your first study of it.

I bet that, if you even passed Java Certification Exam, you can not answer most of them stright away! This kind of questions demands not only understanding of JLS (Java Language Specification) but more broad knowledge as well, often from another languages and computer platforms. Part of questions are touching a few languages simultuoneously and do comparison of pros and cons.

Thus, they will give you more knowledge, better perspective to programming and computer science especialy. In modern live we have to be better prepared for fast changing world. Computer world changes even faster! This is most dynamically developing area of human knowledge and get updated

fast - most difficult problem. I often feel that it is like ice cake riding . Small delay and you are in a cold water!

As I mention above, this book is collection of tips that are given by many people on different Internet forums. I had no possibility to contact to all of them about right to include their advices into this book. Since they were published on public forums and are redistributed by many sites (that give access to newsgroups and their archives) I believe it will not be a problem if I will collect some of them into one book.
I kept the names and signs under tips that often points to their sites. I think it will be even beneficial for them to be included into this book.

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Alexandre Patchine

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About author

John Andersson is my pseudonym which I use in my newsletters and on my website JavaFAQ.nu.
It will be probably long explanation why I, as well as other people, use pseudonyms. So, I skip it for "clarity" :-)

I am planning to continue my job in the future and collect more tips for you!

Alexandre Patchine

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