# Online Chapter A

# Setting Up Your Computer

This online chapter explains how you can setup to write Java programs without using an integrated development environment (an environment like JCreator). The chapter also gives instructions for setting up non-Windows computers.

## *Using a Command Prompt Window*

If you're not familiar with your system's command prompt window, you should check it out right away. Table A-1 explains how.

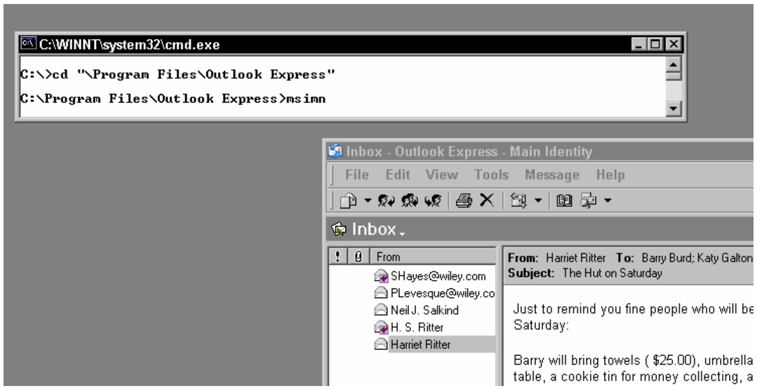
**Table A-1 Finding Your System's Command Prompt Window**

| ***If Your Operating System Is*** | ***Do This*** |
|---|---|
| Windows 95 or 98 | Choose Start->Programs->MS-DOS Prompt. |
| Windows 2000 | Choose Start->Programs->Accessories->Command Prompt. |
| Windows XP | Choose Start->All Programs->Accessories->Command Prompt. |
| Windows Me | Choose Start->Programs->Accessories->MS-DOS Prompt. |
| Windows NT | Choose Start->Programs->Command Prompt. |
| Linux | Click the icon that looks like a computer monitor. |
| Mac OS X | Run the Terminal application, which is in |

| | |
|---|---|
| | Applications/Utilities. |
| Mac Classic | (Sorry, with the Macintosh Classic OS, there’s no command prompt that’s of much use for running Java programs. See the Macintosh-specific notes that appear later in this chapter.) |

The command prompt window is a place where geeks type cryptic instructions for the computer to follow. For instance, instead of clicking the Outlook Express icon, you can go to your command prompt window and type the `msimn` command. When you do this, Outlook Express opens its own beautiful-looking window on your screen. (See Figure A-1.)

Figure A-1: Using the command window to open Outlook Express.



C:\WINNT\system32\cmd.exe

```
C:\>cd "\Program Files\Outlook Express"

C:\Program Files\Outlook Express>msimn
```

Inbox - Outlook Express - Main Identity
File Edit View Tools Message Help
Inbox
From

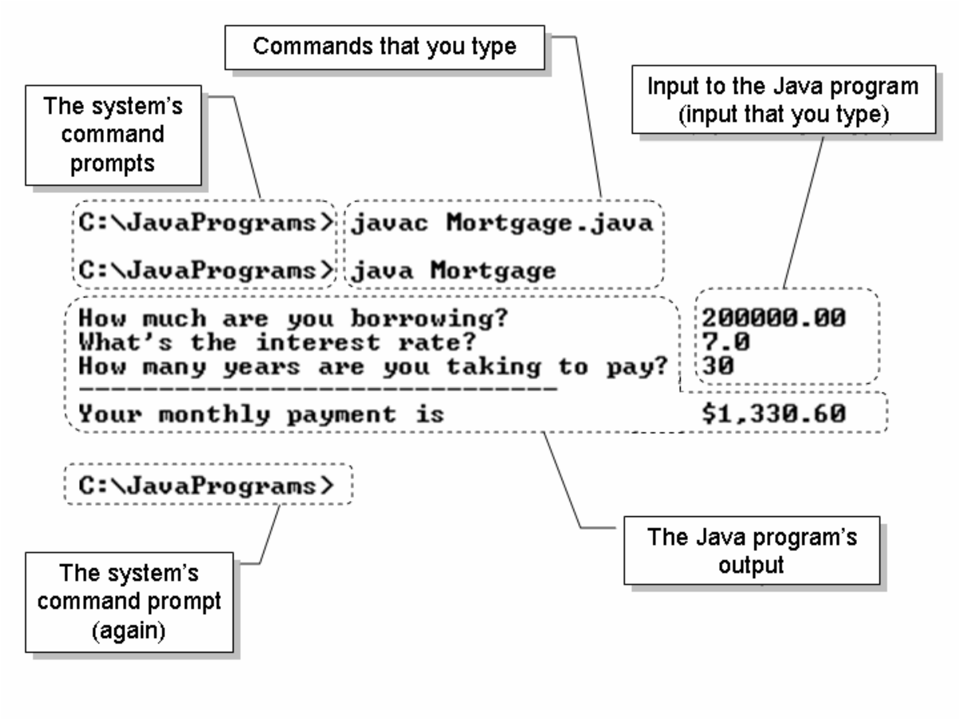
SHayes@wiley.com
PLevesque@wiley.co
Neil J. Salkind
H. S. Ritter
Harriet Ritter

**From:** Harriet Ritter **To:** Barry Burd; Katy Galton
**Subject:** The Hut on Saturday

Just to remind you fine people who will be
Saturday:

Barry will bring towels ( $25.00), umbrella
table, a cookie tin for money collecting, a

The MorgageText test program that you run in the book is very different from Outlook Express. The test program doesn’t open its own window. While the program runs, anything you type appears in the command prompt window along with anything that the program displays. (See Figure A-2.) A program like this, that operates completely in the command prompt window, is called a *text-based program*.



```
C:\JavaPrograms>javac Mortgage.java

C:\JavaPrograms>java Mortgage
How much are you borrowing?                200000.00
What's the interest rate?                  7.0
How many years are you taking to pay?      30
------------------------------
Your monthly payment is                    $1,330.60

C:\JavaPrograms>
```

Commands that you type
The system's command prompts
Input to the Java program (input that you type)
The Java program's output
The system's command prompt (again)

Figure A-2: Compiling and running a text-based program.

Figure A-2 contains four different kinds of text. I summarize these four flavors in Table A-2.

**Table A-2 Four Things You Find in a Command Prompt Window**

| | *Communicating with the Computer's Operating System* | *Communicating with your own Java Program* |
|---|---|---|
| **Text that the computer displays for you** | The system's command prompt | Output of your Java program |
| **Text that you type** | Commands that you type | Input to your Java program |

Here's a more thorough description of the four kinds of text:

* **The system's command prompt.**

  With the text `C:\JavaPrograms>`, the computer invites you (prompts you) to type a command.

* **Commands that you type.**

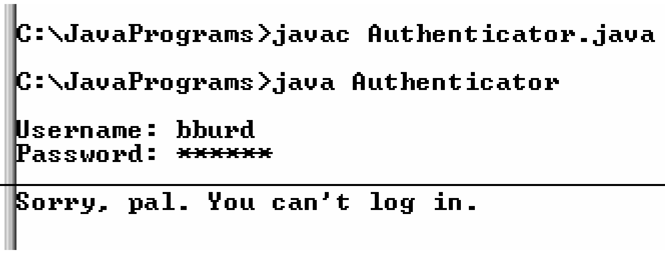
  By typing **`javac Mortgage.java`**, you command the system to compile the contents of your `MortgageText.java` file. Then, by typing **`java MortgageText`**, you command the system to run the compiled version of the `MortgageText` program.

* **Your input to the Java program (while the program runs).**

  You feed information to the program while the program is running. In Figure A-2, you type the numbers **`200000.00`**, **`7.0`** and **`30`**.

  For some other program, your input may consist of words rather than numbers. (See Figure A-3.) For a program that displays a window, your input may include all kinds of things, such as mouse clicks, voice dictation and images from your hard drive.

Figure A-3: A text program with non-numeric input.



```
C:\JavaPrograms>javac Authenticator.java

C:\JavaPrograms>java Authenticator

Username: bburd
Password: ******

Sorry, pal. You can't log in.
```

* **The output of the Java program (while the program runs).**

While the program runs, the computer displays things like `How much are you borrowing?` and `What's the interest rate?` Eventually, the computer displays a monthly payment amount, like `$1,330.60`.

The system prompt in Figures A-2 and A-3 is `C:\JavaPrograms`. This means that `C:\JavaPrograms` is currently the *working directory*. The working directory is the first place where the computer looks for things that you type in your commands. For instance, in Figure A-3, you tell the computer to compile the `Authenticator.java` file. Since `C:\JavaPrograms` is your working directory, the computer looks for `Authenticator.java` in the `C:\JavaPrograms` directory.

Once you've made friends with the command prompt window, you're ready to work with the Java SDK.

# Setting the PATH and the CLASSPATH

The way you set your system's environment variables depends on a few different things. Mainly it varies from one operating system to another. If you're running Unix, it varies with your choice of shell.

This section has instructions for setting the `PATH` and the `CLASSPATH` in several different operating systems. (If you've done this kind of thing before, and you're comfortable setting environment variables, then just do it without reading the rest of this section.)

## Windows 2000

1. **Choose Start->Settings->Control Panel->System.**

   The System Properties window appears.

2. **In the System Properties window, select the Advanced tab. Then click the Environment Variables button.**

   The Environment Variables window appears.

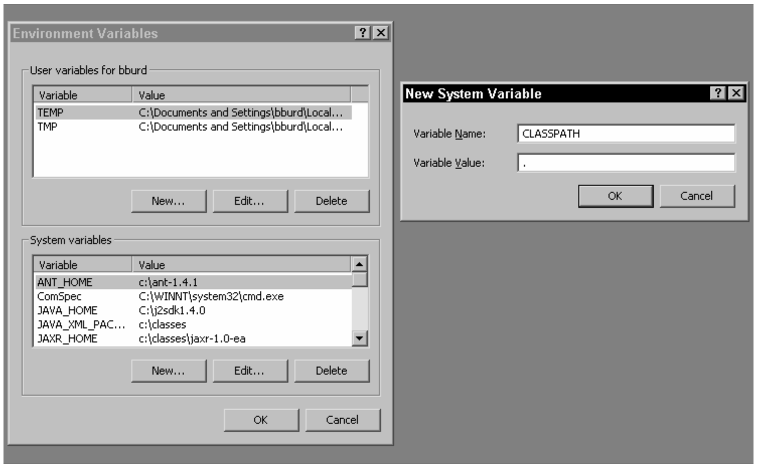
3. **In the Environment Variables window, check to see if there's a variable named `CLASSPATH`.**

   The name is not case-sensitive. It could be `classpath`, `cLaSsPaTh`, or anything spelled that way.

   a. If the Environment Variable window doesn't already have a variable named `CLASSPATH`, then click either of the New buttons. (One New button creates a variable for you alone. The other New button, if it's available, creates a variable for all users on the system.)

   A New Variable dialog box is opened. For the variable name, type **`CLASSPATH`**. For the value, type a dot. (See Figure A-5.)

Figure A-5: Creating a CLASSPATH variable in Windows 2000.



| Variable | Value |
|---|---|
| TEMP | C:\Documents and Settings\bburd\Local... |
| TMP | C:\Documents and Settings\bburd\Local... |

| Variable | Value |
|---|---|
| ANT_HOME | c:\ant-1.4.1 |
| ComSpec | C:\WINNT\system32\cmd.exe |
| JAVA_HOME | C:\j2sdk1.4.0 |
| JAVA_XML_PAC... | c:\classes |
| JAXR_HOME | c:\classes\jaxr-1.0-ea |

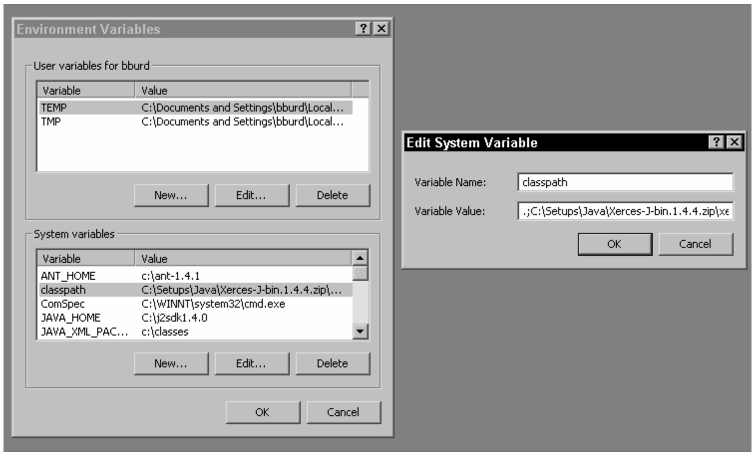
Variable Name: CLASSPATH

Variable Value: .

   b. If there's already a variable named `CLASSPATH`, then select the `CLASSPATH` line in the Environment Variables window. Click the Edit button that's below the `CLASSPATH` line.

   An Edit Variable dialog box opens. First, make sure that the little Variable Name field has the word `CLASSPATH` in it. Then in the Variable Value field, type a dot. To separate your new dot from what's already in the Variable Value field, type a semicolon. (See Figure A-6.)

Figure A-6: Adding a dot to the CLASSPATH (Windows 2000).



| Variable | Value |
|---|---|
| TEMP | C:\Documents and Settings\bburd\Local... |
| TMP | C:\Documents and Settings\bburd\Local... |

| Variable | Value |
|---|---|
| ANT_HOME | c:\ant-1.4.1 |
| classpath | C:\Setups\Java\Xerces-J-bin.1.4.4.zip\... |
| ComSpec | C:\WINNT\system32\cmd.exe |
| JAVA_HOME | C:\j2sdk1.4.0 |
| JAVA_XML_PAC... | c:\classes |

Variable Name: classpath

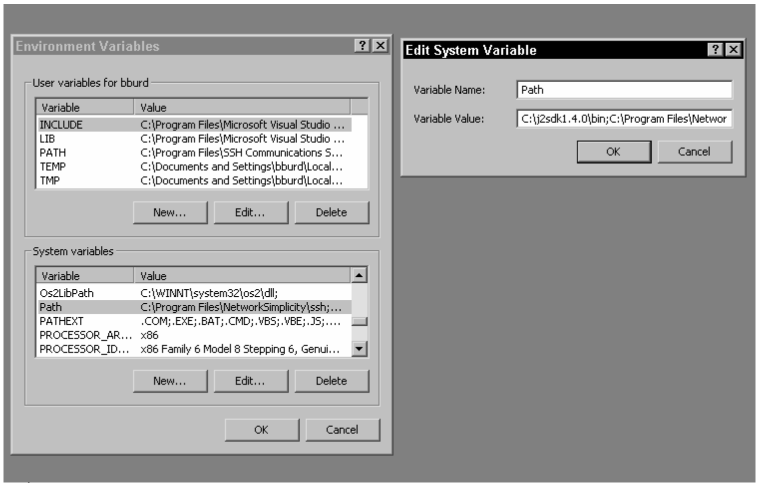
Variable Value: .;C:\Setups\Java\Xerces-J-bin.1.4.4.zip\xe

4. **Repeat Step 3 for the `PATH` variable.**

   I'd be surprised to find a system that doesn't already have a `PATH` variable. Select the `PATH` line in the Environment Variables window. Click the Edit button that's below the `PATH` line.

   When the Edit Variable dialog box opens, make sure that the little Variable Name field has the word `PATH` in it. Then, in the Variable Value field, type the name of your Java bin directory. To separate your new addition from what's already in the Variable Value field, type a semicolon.

   For instance, in Figure A-7, I need to add `c:\j2sdk1.4.0\bin` to the path. So, in the Variable Value field, I type **`c:\j2sdk1.4.0\bin`**, followed by a semicolon.



Environment Variables

User variables for bburd

| Variable | Value |
|---|---|
| INCLUDE | C:\Program Files\Microsoft Visual Studio ... |
| LIB | C:\Program Files\Microsoft Visual Studio ... |
| PATH | C:\Program Files\SSH Communications S... |
| TEMP | C:\Documents and Settings\bburd\Local... |
| TMP | C:\Documents and Settings\bburd\Local... |

System variables

| Variable | Value |
|---|---|
| Os2LibPath | C:\WINNT\system32\os2\dll; |
| Path | C:\Program Files\NetworkSimplicity\ssh;... |
| PATHEXT | .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.... |
| PROCESSOR_AR... | x86 |
| PROCESSOR_ID... | x86 Family 6 Model 8 Stepping 6, Genui... |

Edit System Variable

Variable Name: Path

Variable Value: C:\j2sdk1.4.0\bin;C:\Program Files\Networ

Figure A-7: Adding a directory to the PATH (Windows 2000).

5. **Click OK in every window that's been opened.**

   Click OK in the Edit Variable or New Variable window, in the Environment Variables window, and in the System Properties window.

6. **Close any command prompt windows that you currently have open.**

   Those old command prompt windows don't use the updated `PATH` and `CLASSPATH` values. So type the word **exit** in each old command prompt window. Thereafter, any new command prompt windows will carry the updated values.

## *Windows XP*

1. **Choose Start->Control Panel->Performance & Maintenance->System.**

   The System Properties window appears.

2. **Follow the instructions above for Windows 2000 (starting with step 2).**

The Windows XP Environment Variables box is just like its counterpart in Windows 2000. The only difference is that Windows XP has dazzling colors instead of neutral blues and grays. To protect your eyesight, please wear sunglasses.

## *Windows NT*

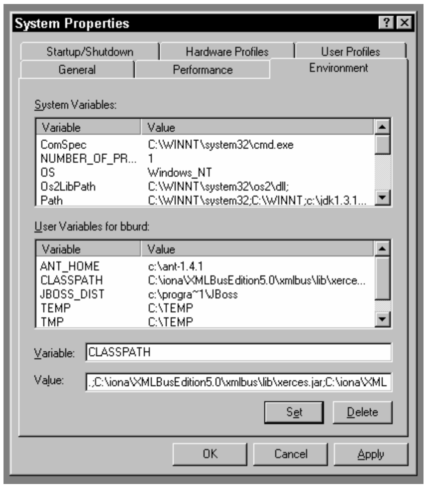
1. **Choose Start->Settings->Control Panel->System.**

   The System Properties window appears.

2. **In the System Properties window, select the Environment tab.**
3. **Follow step 3 in the Windows 2000 instructions above.**

   At this point in the process, the only difference between Windows NT and Windows 2000 is that Windows 2000 displays a separate New Variable or Edit Variable window. With Windows NT, the variable's name and value are displayed right in the old System Properties window. (See Figure A-8.)

Figure A-8: Adding a dot to the CLASSPATH (Windows NT).



System Variables:

| Variable | Value |
|---|---|
| ComSpec | C:\WINNT\system32\cmd.exe |
| NUMBER_OF_PR... | 1 |
| OS | Windows_NT |
| Os2LibPath | C:\WINNT\system32\os2\dll; |
| Path | C:\WINNT\system32;C:\WINNT;c:\jdk1.3.1... |

User Variables for bburd:

| Variable | Value |
|---|---|
| ANT_HOME | c:\ant-1.4.1 |
| CLASSPATH | C:\iona\XMLBusEdition5.0\xmlbus\lib\xerce... |
| JBOSS_DIST | c:\progra~1\JBoss |
| TEMP | C:\TEMP |
| TMP | C:\TEMP |

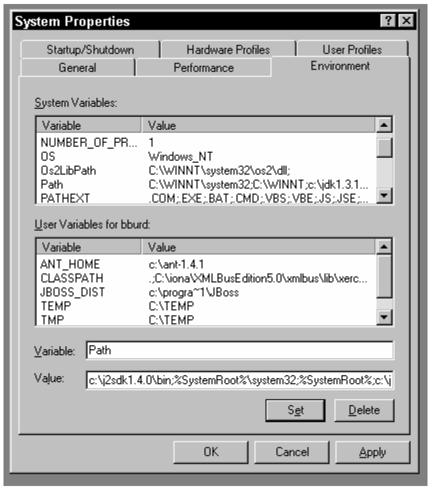
Variable: CLASSPATH

Value: .;C:\iona\XMLBusEdition5.0\xmlbus\lib\xerces.jar;C:\iona\XML

4. **Follow step 4 in the Windows 2000 instructions above.**

   With Windows NT, the variable's name and value are displayed in the System Properties window. (See Figure A-9.)

Figure A-9: Adding a directory to the PATH (Windows NT).



System Variables:

| Variable | Value |
|---|---|
| NUMBER_OF_PR... | 1 |
| OS | Windows_NT |
| Os2LibPath | C:\WINNT\system32\os2\dll; |
| Path | C:\WINNT\system32;C:\WINNT;c:\jdk1.3.1... |
| PATHEXT | .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;... |

User Variables for bburd:

| Variable | Value |
|---|---|
| ANT_HOME | c:\ant-1.4.1 |
| CLASSPATH | .;C:\iona\XMLBusEdition5.0\xmlbus\lib\xerc... |
| JBOSS_DIST | c:\progra~1\JBoss |
| TEMP | C:\TEMP |
| TMP | C:\TEMP |

Variable: Path

Value: c:\j2sdk1.4.0\bin;%SystemRoot%\system32;%SystemRoot%;c:\j

5. **In the System Properties window, click the Set button, then click the OK button.**

6. **Close any command prompt windows that you currently have open.**

   Type the word **exit** in each old command prompt window. Thereafter, any new command prompt windows will carry the updated values.

*<Warning>*

It's easy to forget to click the Set button in step 5. If you don't click the Set button, then any changes that you enter have no effect. This can drive you crazy. (I ought to know. I'm crazy.)

## *Windows 95, 98, or Me*

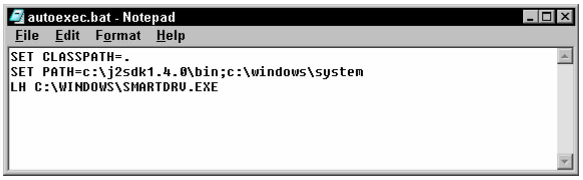
1. **Choose Start->Programs ->Accessories->Notepad.**

   This sequence of clicks opens Windows Notepad.

2. **Choose File->Open. In the File name box, type `\autoexec.bat`, and click the Open button.**

This little ritual opens the \autoexec.bat file. (See Figure A-10.)

Figure A-10: Editing the \autoexec.bat file (Windows 95, 98, or Me).



```
SET CLASSPATH=.
SET PATH=c:\j2sdk1.4.0\bin;c:\windows\system
LH C:\WINDOWS\SMARTDRV.EXE
```

3. **Set the CLASSPATH in the \autoexec.bat file.**

   a. If the file has nothing about a CLASSPATH in it, then you need an additional line to the \autoexec.bat file. (It doesn't matter if you put the line in the beginning, the middle, or the end of the file.) Your new CLASSPATH variable's value should be nothing but a dot. So add the line

   ```
   SET CLASSPATH=.
   ```

   to the \autoexec.bat file.

   b. If the file has a line that starts with CLASSPATH or SET CLASSPATH, then add a dot to the start of the CLASSPATH. To separate your new dot from what's already in the CLASSPATH, type a semicolon. Your \autoexec.bat file ends up having a line of the following kind:

   ```
   SET CLASSPATH=.;C:\classes;C;\Program Files\Tomcat
   ```

4. **Set the PATH in the \autoexec.bat file.**

   The \autoexec.bat file probably has a line that starts with PATH or with SET PATH. Add your Java bin directory to start of the PATH. To separate your Java bin directory from what's already in the PATH, type a semicolon. Your \autoexec.bat file ends up having a line of the following kind:

```
SET PATH= C:\Program Files\Java\jdk1.5.0\bin;c:\windows\system
```

   To find the name of your Java bin directory, see the explanation that accompanies Figure A-4.

5. **Choose File->Save.**

   Congratulations! You just modified your `\autoexec.bat` file.

6. **Choose Start->Shut Down->Restart.**

   The changes don’t take effect until you reboot your system.

## *Unix and Linux*

What you do to set the CLASSPATH in a Unix-like operating system depends on several things, including the kind of command shell that you’re using. For instance, if you’re using the Bourne shell (sh) or the Korn shell (ksh), then add lines of the following kind to your `~/.profile` file:

```
PATH=/usr/java/jdk1.5.0/bin:$PATH; export PATH
CLASSPATH=.; export CLASSPATH
```

If you’re using the Bourne-Again shell (bash), then add lines of that kind to either your `~/.bashrc`, `~/.bash_profile`, `~/.bash_login`, or `~/.profile` file. Your choice of file depends on the way in which you use the command shell, and on which of these files already exist. (For more details, check the `bash` man pages.)

If you’re running the C shell (csh), then add lines like the following to the `~/.cshrc` file:

```
set PATH="${PATH}:/usr/java/jdk1.5.0/bin"
set CLASSPATH=.
```

On some versions of the C shell, you use a `setenv` command in the `~/.cshrc` file:

```
setenv PATH "${PATH}:/usr/java/jdk1.5.0/bin"
setenv CLASSPATH .
```

## *Macintosh OS X*

Mac’s OS X is based on Unix, so most of the previous section’s advice applies to the OS X Terminal. (For information on opening a Terminal window, see Table A-1.)

When choosing which of the previous section’s commands to use, try the C shell commands first. (Macs use tcsh -- the TENEX C shell -- so all the C shell commands should work.) Just add lines from the previous section to your `/etc/csh.cshrc`, `~/.tcshrc`, or `~/.cshrc` file.

## *Macintosh Classic*

As far as I know, there’s no version of Java 5.0 for the Mac Classic. But if you want to compile older Java programs on a Mac, this section shows you how.

First, see the *next* online chapter for instructions on creating a JavaPrograms folder. Then, do the following:

- Find the MRJ SDK folder.
- Inside the MRJ SDK folder, find the tools folder.
- Inside the tools folder, look for the JDK tools folder.
- Inside the JDK tools folder, find the javac icon. Double click that icon to run the javac program.
- Drag your JavaPrograms folder to the javac program’s Classpath pane.
- Close the javac program.
- Back in the original tools folder, look for the Application Builders folder.
- In the Application Builders folder, find the JBindery folder.
- Inside the JBindery folder, find the JBindery icon. Double click that icon to run the JBindery program. (This JBindery program is what I call the java command in most of this book.)
- On the left side of the JBindery program’s window, click the Classpath icon. This opens the Classpath panel.
- Drag your JavaPrograms folder to the Classpath panel’s Additions to Classpath pane.
- Close the JBindery program.