

Instructions for Using Java on Mac OS X

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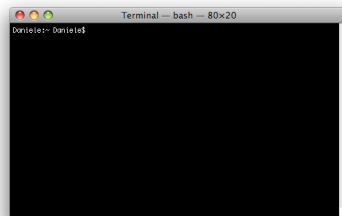
Installing Java

Mac OS 10.6 ("Snow Leopard") & Earlier

If your computer is running Mac OS 10.6 or earlier, Java should already be installed on your computer. In order to check if the installation was done correctly, you must use an application called Terminal.

Using Terminal

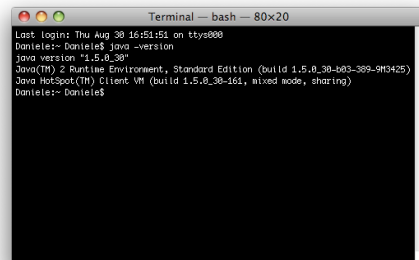
In order to open Terminal, go to the "Applications" tab in Finder, open the "Utilities" folder, and double-click on "Terminal." A window similar to the one shown below should open on your screen.



Now, type the command shown below into the Terminal window and press the enter/return key.

```
java -version
```

If Java is installed, the Terminal window should display information regarding the version of Java installed on your computer (for a newer computer, this should be build 1.5 or build 1.6).



After that, type the command shown below into the Terminal window and press the enter/return key.

```
which javac
```

Now, the Terminal window should display something similar to "/usr/bin/javac." This means that Java has been installed correctly on your computer.

Congratulations, you are now ready to learn how to compile and run programs!

Note: You should make sure that Java is up-to-date. To do this, follow the instructions for using Software Update on page five of this manual. This step is NOT necessary.

Installing Java

Mac OS 10.7 ("Lion")



If your computer is running Mac OS 10.6 ("Lion"), Java, by default, is NOT installed on your computer. If you have already installed Java on your computer to run Java applications, please read the "Using Terminal" section on page three of this manual. If you have NOT installed Java, continue by trying one of the following solutions. Remember, you will need an Internet connection.

Solution One (Direct Download)

To download Java directly from your Web browser, copy the following URL into the address bar and press the enter/return key.



<http://support.apple.com/kb/DL1421>

Click "Download" on the right side of the page and Java will begin downloading to your computer. Once it is finished downloading, the installer will open. Follow the on-screen instructions to finish the installation of Java. To check if Java has been installed correctly, proceed by reading the "Using Terminal" section on page three of this manual.

Solution Two (Java Preferences)



Java Preferences

In order to open Java Preferences, go to the "Applications" tab in Finder, open the "Utilities" folder, and double-click on "Java Preferences." A prompt should show up on your screen informing you of the missing Java runtime and asking you if you wish to install one now. Click "Install" and follow the on-screen instructions to finish the installation of Java. To check if Java has been installed correctly, proceed by reading the "Using Terminal" section on page three of this manual.

Solution Three (Running a Java Applet)



Another way to install Java on Mac OS X 10.7 is to try running a Java applet on a Web browser or to try running a Java application on your computer. To try running a Java applet, navigate to a site that requires Java. One good site to try is included below.

<http://javatester.org/version.html>

Once the site loads, a prompt should show up on your screen informing you that Java is required and asking you if you would like to install Java now. Click "Install" and follow the on-screen instructions to finish the installation of Java. To check if Java has been installed correctly, proceed by reading the "Using Terminal" section on page three of this manual.

Note: You should make sure that Java is up-to-date. To do this, follow the instructions for using Software Update on page five of this manual. This step is NOT necessary.

Updating Java

Mac OS 10.7 (“Lion”) & Earlier



If your computer is running Mac OS 10.6 (“Lion”) or an earlier version of Mac OS X, you must use Software Update to update Java.

Using Software Update

In order to open Software Update, click on the Apple logo at the top-left corner of your computer’s screen. Then click “Software Update...” This should open the Software Update program, which will start searching for available updates. Once the list of updates has loaded (as shown below), check the boxes on the left side of the updates you wish to install and click “Install.”



You will most likely need administrator privileges to install the updates. The program will prompt you for a username and password. Unless someone other than you set up your computer, your username and password should work to allow the updates to install. If this does not work, find the person who set up your computer and ask them for the administrator username and password.

Congratulations, if everything worked correctly, your computer now has the most current version of Java! To check if Java actually updated, read the “Using Terminal” section on page three of this manual.



Writing a Program

Mac OS X (All Versions)

A simple program is needed to learn how to compile and run Java programs on Mac OS X. Writing a program requires a simple text editor. The one that comes pre-installed on Macs is called TextEdit.

Using TextEdit



In order to open TextEdit go to the “Applications” tab in Finder and double-click on “TextEdit.” A blank window titled “Untitled” should open on your screen. Before writing a program in TextEdit, some of the preferences must be changed. Click on “TextEdit” at the top-left area of the screen and then click “Preferences...” Under the section titled “Format,” fill in the oval next to the words “Plain text.” Next, change tabs by clicking on “Open and Save” at the top of the window. Uncheck the box next to the words “Add ‘.txt’ extension to plain text files.” You may now close the Preferences window.

A Java test program has been included below. In order to save this onto your computer, open a new document on TextEdit (click “File,” then “New”). Copy the program (without the “Hello, world” Program title) into the file.

“Hello, world!” Program

```
public class starter
{
    public static void main(String args[])
    {
        System.out.println("Hello, world!");
    }
}
```

Now, click on “File” and “Save As.” Title your program “starter.java” (without the quotes). Using this name will make it easier to follow the instructions for compiling and running provided in this manual. The instructions in this manual are also easier to follow if you save the file on your desktop for now.

Congratulations, you have saved your first Java program on your Mac! You are now ready to learn how to compile and run your programs.



Compiling Code

Mac OS X (All Versions)

The basic way described here for compiling code will work at all times and without errors (except for the errors in your program), assuming you do it correctly. The advanced way on page eight will teach you to create command files (which are the Mac equivalent of a batch file on Windows). It will also work without errors (other than the ones in your program), if everything is done EXACTLY as described in this manual.

Basic

To compile code, open Terminal (if you do not know how to do this, read the first paragraph of “Using Terminal” on page three of this manual). You will now have to navigate to the folder in which you have saved your code (the “.java” file).

Navigating Using Terminal

To navigate using Terminal, use the following commands (remember to press the enter/return key once you have typed them).



```
ls
```

```
cd <name of directory>/
```

```
cd ../
```

The “ls” command produces a list of all files and directories (folders) in the Terminal’s current directory (folder). By using the “cd <name of directory>/” command, you can change the directory in which Terminal is looking. Simply replace “<name of directory>” with the name of the folder you want to navigate to. If your folder’s name contains spaces, when typing the name of the directory, place a back slash (“\”) right before the space (i.e. if your folder is called “AP Computer Science,” type it as “AP\ Computer\ Science”). Assuming you saved your program on your desktop, you will simply need to type the following command and hit the enter/return key.

```
cd Desktop/
```

The “cd ../” command allows you to navigate up one directory (folder) level.

Now use the commands you have learned to navigate to the folder in which you have saved your program. Once this has been done, you can compile your code. In a Terminal window, type the command shown below and hit the enter/return key.

```
javac *.java
```

This will create the “.class” file in the same directory as your “.java” file.

Congratulations, you have compiled your first Java program on your Mac! Proceed to the section on running programs on page nine of this manual.



Compiling Code

Mac OS X (All Versions)

The advanced way described here for compiling code will teach you to create command files (which are the Mac equivalent of a batch file on Windows). In order for this method to work, everything must be done EXACTLY as is described in this manual.

Advanced

One way to compile code is to write a command file for Mac OS X. To write a command file, you must first open TextEdit and change the preferences in the way that is described in the "Using TextEdit" section on page six of this manual.

Once you are ready, open a new document in TextEdit (click "File," then "New"). In the blank document, copy the script included below EXACTLY as it is shown (without the "Compile.command" title).

Note: The third line of the following script requires the use of back quotes and double quotes. Make sure they are included correctly.

Compile.command

```
#!/bin/sh  
  
cd "`dirname "$0"`"  
  
javac *.java
```

Now, save this file on your desktop with the name "Compile.command" (without the quotes). Once this is done, you will have to open Terminal (if you do not know how to do this, read the first paragraph of "Using Terminal" on page three of this manual).

After that, you must navigate to where you have saved your "Compile.command" file. To do this, use the methods described in the "Navigating Using Terminal" section on page seven of this manual.

Now, in the Terminal window, type the command shown below and hit the enter/return key.

```
chmod +x Compile.command
```

This will give you permission to run the command file.

Congratulations, you are now ready to use your command file! Simply double-click on it to compile ".java" files. You may also make copies of the "Compile.command" file and keep them in the same folder as your program files. Proceed to the section on running programs on page nine of this manual.



Running Compiled Programs

Mac OS X (All Versions)

The basic way described here for running compiled programs will work at all times and without errors (except for the errors in your program), assuming you do it correctly. The advanced way on page ten will teach you to create command files (which are the Mac equivalent of a batch file on Windows). It will also work without errors (other than the ones in your program), if everything is done EXACTLY as described in this manual.

Basic

To run a program, open Terminal (if you do not know how to do this, read the first paragraph of “Using Terminal” on page three of this manual). You will now have to navigate to the folder in which you have saved your compiled program (the “.java” file and the “.class” file).

You will now have to navigate to the folder in which you have saved your code (the “.java” file). To do this, use the methods described in the “Navigating Using Terminal” section on page seven of this manual.

Once you have navigated to the folder storing your compiled program, you must type the following command into a Terminal window and press the enter/return key.

Note: This will only work if you named your program “starter.java” (without the quotes). If this is not the case, replace “starter” in the command shown below with the name you gave your program files (without quotes or extensions).

```
java starter
```

Congratulations, your first Java program will now start running on your Mac!

```
Terminal — bash — 80x20
Last login: Thu Aug 30 18:08:06 on console
Daniele:~ Daniele$ cd Desktop/
Daniele:Desktop Daniele$ java starter
Hello, world!
Daniele:Desktop Daniele$
```



Running Compiled Programs

Mac OS X (All Versions)

The advanced way described here for running compiled programs will teach you to create command files (which are the Mac equivalent of a batch file on Windows). In order for this method to work, everything must be done EXACTLY as is described in this manual.

Advanced

One way to run programs is to write a command file for Mac OS X. To write a command file, you must first open TextEdit and change the preferences in the way that is described in the "Using TextEdit" section on page six of this manual.

Once you are ready, open a new document in TextEdit (click "File," then "New"). In the blank document, copy the script included below EXACTLY as it is shown (without the "Run.command" title).

Note: This will only work if you named your program "starter.java" (without the quotes). If this is not the case, replace "starter" in the script shown below with the name you gave your program files (without quotes or extensions). Also note that line three of the script requires both back quotes and double quotes. Make sure they are included correctly.

Run.command

```
#!/bin/sh

cd "`dirname "$0"`"

java starter
```

Now, save this file with the name "Run.command" (without the quotes) to the folder that contains your program files. Once this is done, you will have to open Terminal (if you do not know how to do this, read the first paragraph of "Using Terminal" on page three of this manual).

In Terminal, you must navigate to where you have saved your "Run.command" file. To do this, use the methods described in the "Navigating Using Terminal" section on page seven of this manual.

Now, in the Terminal window, type the command shown below and hit the enter/return key.

```
chmod +x Run.command
```

This will give you permission to run the command file.

Congratulations, you are now ready to use your command file! Simply double-click on it to run your program. You may also make copies of the "Run.command" file and keep them in the same folder as your program files (assuming you give the same name to all of your programs). Should you wish to change the name of your program files, you must also modify the name in the "Run.command" file.

Installing ObjectDraw

Mac OS X (All Versions)



ObjectDraw is a library of classes and methods available online or from your computer science teacher. The downloadable file can be found at the address included below. The file should immediately start to download to your computer.

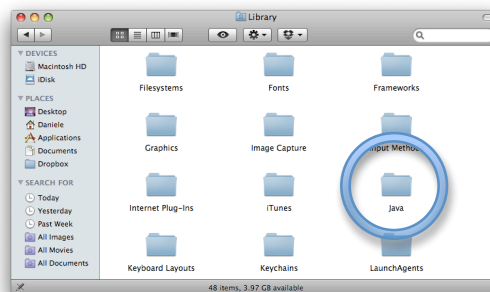
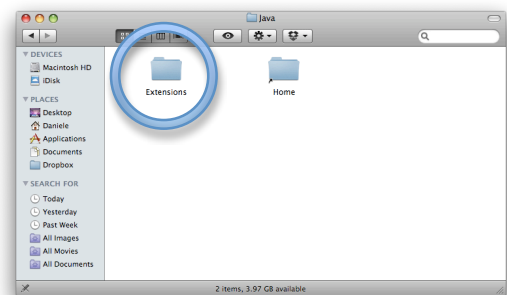
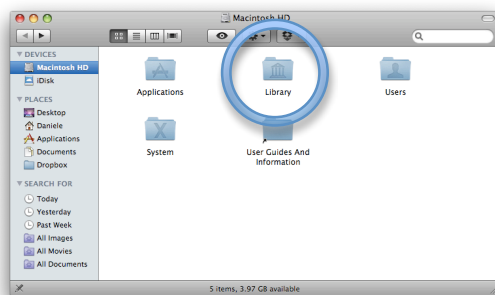
<http://eventfuljava.cs.williams.edu/library/objectdraw.jar>

Installation



To install ObjectDraw, first find the file on the computer once it has downloaded. Now, open “Macintosh HD” (Hard Drive). This can either be found on the desktop or under the “Devices” tab in every Finder window. After you have opened “Macintosh HD,” navigate to the “Library” folder. Then, search for and open the folder entitled “Java.” Inside of this folder are two folders, one of which is called “Extensions.” That folder is where all third-party Java libraries should be installed. Drag the “objectdraw.jar” file into the “Extensions” folder. You will most likely need administrator privileges to modify the “Extensions” folder. A message will show on the computer screen. Click “Authenticate” and type in the computer’s administrator username and password (see the penultimate paragraph of “Updating Java” on page five of this manual for more information). Once the ObjectDraw library has been placed in the “Extensions” folder, its included classes and methods can be used in Java programs on the computer.

Congratulations, ObjectDraw is now installed on your computer! Move on to learning about using this powerful library on the next page.





Using ObjectDraw

Mac OS X (All Versions)

The following sections will show you how to use ObjectDraw in a program.

Test Program

Third-party Java libraries must be imported in programs. The easiest way to use ObjectDraw is to use the format of the test program included below. Your program files should also be named like this test program, "TouchWindow.java" (case-sensitive and without the "TouchWindow.java" subtitle).

TouchWindow.java

```
import objectdraw.*;
import java.awt.*;
public class TouchWindow extends WindowController
{
    public void begin()
    {
        FilledOval Sun = new FilledOval(10,10,100,100,canvas);
        Sun.setColor(Color.yellow);
    }
}
```

HTML File

An HTML file is also required to use ObjectDraw. This file should be named "FirstApplet.html" (case-sensitive and without the "FirstApplet.html" title). If your program file is not named "TouchWindow.java," replace that with your program's file name in the HTML file.

FirstApplet.html

```
<html>
<head>
<title>First Applet</title>
</head>
<body>
<applet code="TouchWindow.class" width="200" height="200"
    alt="TouchWindow.class failed">
Java is disabled
</applet>
</body>
</html>
```

Congratulations, once these files have been added to your batch of program files, you are ready to learn how to compile and run programs using ObjectDraw.



Compiling & Running with ObjectDraw

Mac OS X (All Versions)

Using ObjectDraw in programs is different from other programs. Read the next sections to find out how to compile and run programs that use the ObjectDraw library.

Compiling with ObjectDraw

Fortunately, compiling programs that use ObjectDraw is exactly the same as compiling other java programs (see “Compiling Code” on page seven of this manual).

Running with ObjectDraw

Running programs that use ObjectDraw is slightly different than running other programs. Read page nine of this manual on “Running Compiled Programs.” For the basic version, everything should be done in the same manner except for the last command. Instead of using the “starter” command in Terminal, use the command included below.

```
appletviewer *.html
```

For the advanced version, the “Run.command” file should be changed in a similar fashion. The code for a new “Run.command” file is included below (without the “Run.command” title). Remember to give the file executable permissions (see the “Advanced” subsection of “Running Compiled Code” on page eight of this manual).

Run.command

```
#!/bin/sh
cd "`dirname "$0"`"
appletviewer *.html
```

Congratulations, you are now ready to run your programs that use ObjectDraw!

Troubleshooting

Mac OS X (All Versions)



Should you have difficulties installing Java or following these instructions, you have several options at your disposal. If none of the following options help, you can always try asking someone you know that uses a Mac. A simple search query on an online search engine should also lead you to help.

Princeton Webpage

Princeton's website provides a very useful resource for those whose computer runs Mac OS 10.6 ("Snow Leopard") or earlier. The webpage's URL has been included below.

<http://www.cs.princeton.edu/courses/archive/spr04/cos126/hello/mac.html>

Note: The "Hello, world!" program included on Princeton's website has a small error and will not compile on your computer. The brackets placed after "String" on line two of the program should be placed after "args" on the same line. See the "Hello, world!" Program" section on page six of this manual for the corrected code.

Adobe Webpage

Adobe's website provides a help page on installing Java for those whose computer runs Mac OS 10.7 ("Lion"). The webpage's URL has been included below.

<http://helpx.adobe.com/x-productkb/global/install-java-jre-mac-os.html>

About.com

About.com also has a webpage on installing and updating Java on Macs. The webpage's URL has been included below.

<http://java.about.com/od/gettingstarted/a/javamacosx.htm>