Project 1

CS 1323, Fall 2015

Objectives

1. Install the Java Runtime Environment (JRE). (10 points)
2. Install the eclipse Integrated Development Environment (IDE). (20 points)
3. Install teleconferencing software (VSEE—waived for Linux users). (10 points)
4. Compile a simple Java program. (20 points)
5. Execute a simple Java program. (20 points)
6. Locate the String class in the standard Java documentation (Java API) online or on your computer. (10 points)
7. **Sections 10 and 995 only:** Demonstrate that your system is properly installed by visiting http://problets.org/f15/ou/10 for section 10, or http://problets.org/f15/ou/995 for section 995. (10 points—Section 1 gets these points for free)

For this week only, students in Sections 1 and 995 are welcome to come to lab on Tuesday (8:30-10:20 a.m., 12:30-2:20 p.m., and 2:30-4:20 p.m. M207 Sarkeys Energy Center) if they wish to. Installing computers usually goes smoothly, but when it does not go smoothly debugging the problems can be difficult, or even virtually impossible without tremendous help. Do not wait until Monday night (August 31) to start installing your computer.

Section 10: Before you leave the laboratory, upload your program to the dropbox in Janux and have your computer installation checked by a TA to get credit.

Sections 1 and 995: Upload the simple Java program to the dropbox in Janux.   We will assume that you've done learning objectives #6 and 7 successfully.

This program is due by 11:59 p.m. on Monday, August 31.

Description

This handout is incredibly long and detailed because installing software on the variety of computers that people bring to OU is a complicated process. Don't panic. We have never failed to get a computer installed before, and we won't now.

In order to run Java programs, we need three things:

- Software that allows us to enter programs into the computer (Integrated Development Environment called an IDE--we'll use eclipse)
- Software that allows the computer to translate the program into bytecode (this is the compiler inside of eclipse), and
- Software that reads bytecode and performs computer operations (Java Runtime Environment call the JRE).

You will also need:

- Access to the teleconferencing software for office hours.

If you regularly work in areas without a solid internet connection, you will also need to install:

- Documentation of the libraries that we'll use in this course.

Start a Folder for this class

I've included some help on organizing the information in this class. You don't need to organize the same way I do, but I do encourage you to organize this information in some reasonable fashion. We will have hundreds of files in this class. If you put them all on your desktop it will be a mess and you may have difficulty finding important documents. Besides, learning how to organize your professional life is a valuable skill.

Create a folder for this class. I name my folder CS 1323 Fall 2015. I use dropbox.com to backup my files automatically and allow all of my computers to access them. If you already use this free service, create this folder in your dropbox folder.

If you want to do this, go to dropbox.com to sign up. They give you enough free space for this semester. Dropbox keeps your files both locally and on a server (this is "the cloud"), so if you're not on the internet you still have access to your files. The next time you login, they will be uploaded. Dropbox also allows you to revert to older versions of your files, which can be very helpful if you accidentally delete a file. Although I use dropbox, there are many other cloud services that can be used, and which one you use is entirely your choice. The one choice I do not advise is not backing up your files. This is simply irresponsible in this day and time. Lots of bad things happen to computers, especially laptops. They break. They get stolen.

I recommend making the following folders to keep the class organized. Indentation in the list below is used to indicate folders within folders.

CS 1323 Fall 2015
  Homework
    Homework 1… Homework 6 (this is also 6 separate folders)
  Projects
    Week 1… Week 15 (this is 15 separate folders)
  Project Uploads
  Homework Uploads

Install Software

It is best to perform this installation exactly in the order specified, particularly if you're not very comfortable installing software. **If you install eclipse before Java's JRE, it won't work.** There are videos and PowerPoint presentations on Janux that show this installation if you need to reinstall your system

during the semester. The PowerPoints show old versions of Java/eclipse, so use the newest versions listed in this document. Vsee does not have a Linux version.

For those who are experienced with installing software and were not able to attend the lab, here are the links for the downloads:

Product	Link
Java Runtime Environment (JRE)	http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html
Eclipse	http://www.eclipse.org/downloads/download.php?file=/technology/epp/downloads/release/mars/R/eclipse-java-mars-R-win32.zip
Documentation (only needed if internet connection is poor)	http://www.oracle.com/technetwork/java/javase/documentation/jdk8-doc-downloads-2133158.html
VSEE (teleconferencing)	http://vsee.com/download

If you are using a relatively current Windows system or a Macintosh, it is probably 64 bit. To make your computer program Java correctly you will need to use a browser that supports 64 bit, Java in 64 bit, and eclipse in 64 bit. If your browser is currently 32 bit (which is possible, even on a 64 bit PC, especially if you use Firefox which does not come in 64 bit), you'll need to install a 64 bit version of the browser too. The Firefox fix is later in the document.

If you are running an older Windows system, it could be 32 bit. In this case you will need to install Java and eclipse in 32 bit format. If you are not sure whether your computer is 32 or 64 bit, you'll need to look at the Systems settings in the Control Panel. If you're in Section 10, the TAs can help in lab. If you're in Section 1, the TAs or I can help during office hours or the IT people in the Engineering Practice Facility can help.

Detailed instructions for installation are below. For **Section 10**, we have the software downloaded onto thumb drives so we don't choke the wireless network during the laboratories. Students in **Sections 1 and 995** who cannot attend the laboratory should download the software from the URLs in the table above.

Install the Java Runtime Environment (JRE)
The first step is to install the JRE. If you have a Macintosh computer, this already installed (unless you've removed it or are running the Lion version of the operating system that does not contain the JRE).

If you don't have the JRE installed:
1. Place the thumb drive in your USB port.
2. Browse for the correct version of the Java JRE by going to the folder that describes your computer (Windows PC versus Mac, then 32 bit or 64 bit).
3. **For Windows users:** An installation wizard will be displayed on your screen**. <u>Follow through with the default choices in the wizard so the software will be in the standard location.</u>** It's easier for the TAs to help students if everyone has the same installation setup. Java may ask if you want to uninstall old versions of Java. While this is a preferred security practice, it is

possible but unlikely that this might require you to reinstall other software that is depending on the old version. I recommend that you remove old versions.

Install the Eclipse Integrated Development Environment (IDE)

For Windows Users: Copy the folder named eclipse (or download Eclipse IDE for Java Developers) into the folder that you are using for this class on your system folder (C:\Program Files).   You will want a shortcut to the eclipse.exe file in the folder available on the desktop or the taskbar (my preference), so make it now.

For Macintosh users: Copy the eclipse folder and save it to your Applications folder. You will probably want to create the eclipse application on your dock. To do this, go to the launcher and drag eclipse to the dock.

Check Your Installation

The last thing we need to do is verify that your installation is working. This is first done by running a Java program. The program is similar to the first one we will work on in class and is called Project1_<YourNameHere>.java.   When I say <YourNameHere>, I mean that you should substitute your name for these words. My file would therefore be called Project1_DeborahTrytten.java. Please use your official University name, not your preferred nickname. I know that these details sound picky, but remember that the teaching assistants have to grade hundreds of projects every single week. It is critical that everyone do this properly to simplify the grading process.

Start eclipse.

Create a workspace. This is a folder where your programs will be stored. Have one workspace for the class. Put your workspace in your CS 1323 Fall 2015 folder and call it something like 1323 Programs. This is what I do for the class. You will navigate to the folder you created on the first page and select it. Then create a new folder called 1323 Programs.

When the workspace opens, you need to enter the workbench. This is done with the turned arrow on the right hand side of the screen.

You first need to create a new Java Project. This is done with File -> New -> Java Project. Call it Project 1.

Then create a new class. This is done with the green target button. The source folder should be Project 1/src. Name the class Project1_<YourNameHere>. It is absolutely necessary to get the capitalization and spelling exactly correct. There cannot be any spaces.

Eclipse will try to help you out by entering this:

public class Project1_DeborahTrytten{

}

Enter the program below by typing very, very carefully. Do not copy and paste the code from this handout. Entering the code is part of remembering it in the long term.

```java
/** This program prints out fun facts about CS.
 * @author Deborah A. Trytten (but put your name here)
 * @version 1.0
 * I copied this code from the Project 1 Handout, but it's OK because Dr. Trytten
 * told me to.
 */
public class Project1_DeborahTrytten
{

        // This is the main program.  The instructions here
        // are what is done when the program is run
        public static void main(String[] args)
        {
                System.out.println("Computing jobs are here to stay, "
                        + "regardless of where you are located.");
        }

}
```

Run the program by clicking the green circle with a white arrow. The program should print out the fun CS fact above to the console at the bottom of the screen. If there are errors, see the TA for help. Programming is very detailed, so mistakes may be tiny.

Now change your program by choosing your favorite fun CS fact from this list:
http://computingcareers.acm.org/?page_id=4

You will do this by editing the println statement in the middle of the main program.   You need to keep the double quotes in place, since this is what tells the computer that the characters are a group of letters, called a String, to print.

Install VSEE

VSEE is the teleconferencing software that is used to access some faculty and TA office hours. It's especially nice for this task since it permits window and screen sharing. This makes it possible for the TAs and me to see exactly what you are working on and be really helpful. While teleconferencing office hours may seem unusual, this is a very common practice in all sorts of professional jobs. Now is a great time for you to get comfortable with teleconferencing.

Windows: Copy the VSEE.exe file from the proper folder of the thumb drive to C:\Program Files. Make a shortcut on your desktop or an icon on your taskbar for easy access.

Mac: Click on the VSEE.dmg file from the Macintosh folder of the thumb drive and move it to Applications. Put VSEE on the dock, just like you did with eclipse.

VSEE does not have a Linux version.

Use the Documentation

The last thing to do is to access the documentation. Open your browser and do a search for "Java API". Look for a website from oracle.com. You will want to bookmark this page once you're sure you've found the right one. Go to the Java Application Programmers Interface (API). Find the String class by searching in the class names in the left frame.

If you routinely work places where you will not have good internet access, you may want to install the documentation. It is in the main folder of the thumb drive (there is no 32 bit or 64 bit for web pages). Decompress it to your CS 1323 Fall 2015 folder, then bookmark the API webpage in your browser to make it easy to find.

Sections 10 and 995: Check Problets

Navigate in your browser to the problet website.

Section	URL
10	http://problets.org/user/f15/ou/10/
995	http://problets.org/user/f15/ou/995/

If the problet starts properly, then your setup is verified.

If problets do not start properly, the first thing to do is verify your Java installation. Go to this web page: http://java.com/en/download/installed.jsp?detect=jre&try=1 and it will detect Java, and give you the opportunity to allow Java to run on your browser. If it says that it has detected Java on your computer, your Java installation is probably correct.

There are two possible problems that cause problets to not run: the browser does not support Java (like Chrome) or that your browser is 32 bit and Java 64, or vice versa. You cannot use Chrome to access problets. Install another browser (like Firefox or Safari—although Firefox will create the second problem on a PC and you'll have to solve it too). There are two reasonable solutions to the 32 bit versus 64 bit problem: install the browser in 64 bit, or install a second Java JRE in 32 bit (this will be necessary if you use the Firefox browser, since it does not come in 64 bit). Also, remember to use the chosen browser to access problets when the time comes!

All Sections: Upload File

Now you need to upload your program into Janux. First you have to export the code from eclipse to your computer. In Eclipse, choose File -> Export. In the Window, select, General -> Archive File and click Next at the bottom. Expand Project 1, and select src. Select your file on the right (mine is Project1_Deborah Trytten.java).

Next you need to select the destination. I recommend saving this file to your CS 1323 Fall 2015 folder in a folder called something like ProjectUploads. If you were following my earlier instructions, this folder should be available. If not, make it now (and make those other folders while you're at it). Call your archive file Project1_<YourName>.

Go to janux.ou.edu and upload this zip file to the Project 1 assignment dropbox. This is a two step process. First you upload, then you submit. Remember to do both parts.

Section 10: Once your program is running and you've found the String class in the Java API, call the TA to get credit for completing the lab this week.