Project 1

CS 1323, Fall 2017

# Objectives

1. Install the Java Development Kit JDK. (20 points)
2. Install the eclipse Integrated Development Environment (IDE). (20 points)
3. Compile a simple Java program. (30 points)
4. Execute a simple Java program. (20 points)
5. Locate the String class in the standard Java documentation (Java API) online or on your computer. (10 points)

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 the last minute to start installing your computer, as this will make it impossible for you to complete other class assignments.

When you complete the project, upload your program to the dropbox in Canvas.

This project needs to be done as soon as possible. Nearly everyone should complete it by Friday, September 1, sooner if you can. However, it can be turned in at any time during the semester. This is the only assignment in this class that is accepted late.

# Description

This handout is 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. It may be necessary to reinstall Windows in rare circumstances. This usually happens if you’ve installed a lot of freeware on your computer or the Windows registry has become corrupted.

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 and it is inside the Java Development Kit (JDK)).

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 no matter what you end up doing in life.

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 use dropbox but do not have an account yet, go to dropbox.com to sign up. They give you plenty of 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 (like Google Drive, and OneDrive from Microsoft), 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. Lots of hard work can be lost.

Create a folder for this class. I name my folder CS 1323 Fall 2017

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 2017

Homework

Homework 1… Homework 6 (this is also 6 separate folders)

Projects

Project 1… Project 14 (this is 14 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 JDK, eclipse won’t work.** There are videos and PowerPoint presentations 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.

Here are the links for the downloads.

|  |  |
| --- | --- |
| **Product** | **Link** |
| Java Development Kit | <http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html> |
| Eclipse | <http://www.eclipse.org/downloads/eclipse-packages/> (use Eclipse IDE for Java Developers) |
| Documentation (only needed if internet connection is poor) | <http://www.oracle.com/technetwork/java/javase/downloads/index.html> (download Java SE 8 Documentation) |
| Firefox | <https://www.mozilla.org/en-US/firefox/all/> |

If you are using a relatively new 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), you'll need to install a 64 bit version of the browser too.

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. The TAs can help.

Detailed instructions for installation are below.

## Install the Java Development Kit

The first step is to install the JDK. 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. Download the correct version of the Java JRE by going to the link that describes your computer (Windows PC versus Mac, 32 bit or 64 bit).
2. **For Windows users:** An installation wizard will be displayed on your screen**. Follow through with the default choices in the wizard so the software will be in the standard location.** 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. I recommend that you remove all old versions of Java.

## 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 or 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 promise I’ll call you by your nickname, but grading gets confused if we don’t know who you are). 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 and make sure that you get proper credit for your work.

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 2017 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\_YourNameHere{

}

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.

/\*\* This program prints out a fun fact 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 do it.

\*/

**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 and hard to find at first. Capital and small letters matter, for example.

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.

## 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 2017 folder, then bookmark the API webpage in your browser to make it easy to find.

## Upload File

Now you need to upload your program into Canvas. First you have to export the code from eclipse to your computer. In Eclipse, choose File -> Export. In the Window, select, General -> File System and click Next at the bottom. Expand Project 1, and select src. Select your file on the right (mine is Project1\_Deborah Trytten.java). You should always submit .java files, not .class files.

Next you need to select the destination. I recommend saving this file to your CS 1323 Fall 2017 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).

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