

OBJECT ORIENTED PROGRAMMING (JAVA) (CST8284)

LAB 1

Java Installation and Updates



LAB 1: Introduction

- The **purpose** of this lab is to **ensure** that you have your **environment** (software requirements) properly **set up** for the tasks and assessments in this course.
- Without a proper set up, it will be impossible to complete your work and earn expected marks for this component of the course.



LAB 1: Expected Outcomes

In this lab, you are required to:

- Ensure that the Java Development Kit (JDK) and Java Runtime Environment (JRE) are successfully updated
- Ensure that the Eclipse Integrated Development Environment (IDE) has been properly installed on your computer
- ❖ Demonstrate your correct use of Javadoc

Total marks for this **lab** is 3% when **correctly** and **completely** done.



Grading for Lab 1

- Grading for Lab 1 starts in Week #2. However, you need to work in the lab to do part 3 (Javadocs) and submit your work by the end of the lab
- ❖ Due date is no later than Week #3, (that is your lab section day on that week).
- You will loose your marks if you have not <u>correctly</u> and <u>completely</u> demonstrated <u>your lab in your lab section that week.</u>



Lab 1 Completion Checklist

The Lab Professor will check to see that you:

- Part 1: Correctly installed or updated the Java Development Kit (JDK) / the Java Runtime Environment (JRE)
 - ➤ Java Platform (JDK) 8u35 (or later) **or** Amazon Corretto 11
- Part 2: Correctly installed or updated the Eclipse Photon Integrated Development Environment (IDE)
 - Eclipse 4.4.1 (or later)
- Part 3: Correctly show Javadoc output using a simple example program created by you.



Your installation

- You may have already installed JDK/JRE on your computer or Amazon Corretto 11 or a later version from your previous course in this program.
- ❖ If so, you need to prove to the professor that your installation works as required. Read all instructions in this slide deck to be sure and comply with .
- ❖ If not, follow and complete all instructions as specified.



PART 1 - Installing (or updating) JDK/JRE

Important Note:

- It is advisable to make a <u>fresh</u> install of both <u>JDK/JRE</u> as well as the <u>Eclipse</u> latest version to avoid problems from previous installations.
- Java Version 8 or 11 only is to be used for all aspects of this course.



JDK and JRE – Install the JDK

Two different installations are available for Java.

- JDK: This installation includes:
 - programmer tools to create Java programs
 - JRE to execute Java programs

- JRE: This installation is used to:
 - run Java programs
 - does not have programmer tools



Consider fresh install of JDK/JRE if:

- You have persistent problems running java programs in your current environment
- You have more than one folder each for the JDK and JRE (if yes, update required)
- You see c:\Program Files (x86)\Java in your file Explorer (or any other drive)
- In c:\Program Files\Java the update number of the JDK and JRE is unequal or lower than I8I
 - e.g. JDK 1.8_351 (where the update number is 351).
 - ➤ JRE 1.8_351 (where the update number is 351).



Uninstall Existing Versions Before You Install JDK

Uninstall any older versions of JDK/JRE:

- Go to control panel and click on Programs and Features (uninstall or change program
- Identify the JDK folder and click on it
- > Select uninstall, and follow the instructions
- Do the same for the JRE folder as well
- Check all program files to ensure no other Java subdirectories exist.



To Install JDK - Java Version 8

- Begin by closing out every open webpages to avoid conflicts
- Download JDK "jdk-8u351-windows-x64.exe" from the link:

https://www.oracle.com/java/technologies/javase/javase-jdk8-downloads.html

- Install Java <u>first</u> before you install <u>Eclipse</u>.
- Next instructions are for Windows users. See link/ directions for other OS on same page. More search could be required



Some Helpful Tips...

- Watch the videos posted on "Helpful Videos" section on the left-hand side of the Brightspace course webpage
- You may need to customize the information provided if you are not using the Windows OS.



To Install JDK - Java Version 8 (2)

- Read and accept the License Agreement
- This is Java SE 8u351 (Standard Edition 8 update 351)
- Ensure to select the Windows x64 for your download (e.g. for window users)
- Follow the instructions to create an Oracle account (if you do not have one)
- Double click on the downloaded executable file
- Follow instructions to install and accept the default settings



Try stuff out...

Open the command prompt on you computer by typing command or cmd on the search bar at the bottom left-hand corner. In the command prompt type:

java -version

This will yield the version of java installed that read as: Java version "1.8.0_351"

Also note the JRE details included. No need to install separately.



Try stuff out...(2)

In the command prompt also type: javac –version

- If not well configured, it will yield an error message:
 - 'Java' is not recognized as an internal or external command, operable program or batch file
- If so, then you need to set the PATH



Setting the Path Environment Variable

- The PATH environment denotes the directories that are searched by the computer for applications to run your java applications such as javac and java.
- You must follow installation instructions correctly to avoid problems...
- An error message shows when not properly configured, and reads:

'Java' is not recognized as an internal or external command, operable program or batch file



Setting the Path Environment Variable (2)

Depending on your operating system, information for setting PATH Environment Variable can be found (or the videos posted) in:

https://www.java.com/en/download/help/path.xml

Be sure to use the correct JDK installation directory name, which can change with a new version number. For windows:

c:\Program Files\Java\jdk1.8.0_update number



Setting the Path Environment Variable (3)

- The PATH environment variable must point to the installed JDK's bin subdirectory.
- To Copy (ctrl + c) it, go to Control Panel, Program Files and then Java folder. Double click to see bin folder. Copy the path.



Setting the Path Environment Variable (4)

- Type Env...in the search area at the bottom leftside of your computer to display the "edit the system environment variables" in your control panel.
- Click on Environment variables at the bottom of the box to open another dialog box
- Go to the lower panel on the resulting box, and scroll down the "System variables" section.



Setting the Path Environment Variable (4)

- Click on path and then click on the Edit button below the systems variables panel.
- Scroll to the end of the box, then click on the next row and then paste the path of the bin subdirectory.
- Click enter and then click ok to close all the dialog boxes



To Set JAVA_HOME Environment Variable

- While still in the edit Environment Variables dialog box, check to see if you can find %JAVA_HOME%/bin
- If you do not, manually set up JAVA_Home by:
 - In the Environment variables dialog box, go to the systems variable panel and click New at the bottom of the panel



To Set JAVA_HOME Environment Variable (2)

- Enter JAVA_HOME as the variable name
- Copy the path to the Java installation folder (JDK by going to Windows (C:) drive and then to Program Files to your Java folder
- Be sure to just copy the path to the JDK folder (not the bin subdirectory)
- Paste the path into as the Variable Value and click OK to close all open dialog boxes



Verifying your installation

- Close all open command prompt window and open a new window
- At the command prompt, type:
 - ❖java –version
- Also type:
 - ➤ Javac –version
- Then to see the PATH type:
 - ➤ echo %JAVA_HOME%



Ready to Demonstrate Your Work

If you encountered no error messages (after the verification steps in the last slide):

- Continue to the parts 2 and 3 of the Lab
- Be ready to show your work to your professor for grading



PART 1B:

INSTALLING AMAZON CORRETTO 11





Amazon Corretto 11

❖Please Note that this is optional if you did install Java JDK successfully as in Part 1.



Amazon Corretto 11 Guide

- To install Amazon Corretto 11 review and follow the guide provided to you in Brightspace for this lab.
- This is the same document you may have used during your Level 1
- Ensure that all the requirements from this slide deck are met and then proceed to Part 2 and 3



Uninstall Amazon Corretto 11

If you wish to uninstall:

- You can uninstall Amazon Corretto 11 by following the standard steps to uninstall an application from Windows.
- Open Programs and Features.
- Search for Amazon Corretto 11 and then select it.
- Choose uninstall.



PART 2:

INSTALLING ECLIPSE





Demonstrate that you installed Eclipse Photon correctly

- See the general guide document on Eclipse provided
- The version of Eclipse required for the course is Eclipse 4.4.1 (or later)
- Eclipse is an integrated development environment (IDE) used in programming.
- It has a base workspace and an extensible plugin system for making the environment customized



Demonstrate that you installed Eclipse Photon correctly (2)

- Launch Eclipse to be sure that it has been installed, and works properly on your computer
- To ensure you have the correct version, check for the version number by:
 - Click Help (one of the buttons on the top of the page) and then scroll down and click About Eclipse IDE
- The small dialog box that appears has the version number and other information.



PART 3:

GENERATING JAVADOC





Javadoc - Why do we document?

- Documentation is very important when you write your java code for several reasons.
- Javadoc generates API documentation
- Part 3 shows how to generate and use Javadocs for your documentation.
- Watch the **helpful videos** posted on Brightspace.



Javadoc (1)

To demonstrate your use of Javadoc, you are required to:

- Write the following simple java program in Eclipse, designed to generate a username:
 - Create two classes, called Driver and Username
 - In Username, declare appropriate fields to hold the user's first name, last name and student# (a long value)
 - Add a constructor, getters and setters for each field
 - In Driver, add a main() method that instantiates a new Username object, prompts the user to input the first name, last name, and student number, and loads these values using the Username object's setters.



Javadoc (2)

- Document your code for both classes using javadoc (covered in the hybrid). Your comments must be complete; they must explain what role each class, constructor, and method performs in the context of the program. Simply writing: "this is a setter" is **not** adequate: your documentation needs to be meaningful.
- Provide class headers as you did in CST8116
- ➤ Generate javadoc, being sure that the doc folder is correctly generated in your project, and that the index.html file in doc contains complete hypertext links for both classes



Javadoc (3)

- To obtain marks for this first half of the lab, submit whatever code you have done by the end of the lab session, then demonstrate your program to your lab instructor by the end of the lab period showing both the executing code, and show that the index.html file has correct hypertext links to the program's classes, methods and constructors
- Your lab professor will describe the algorithm for the username in the lab in Week 2. This must be implemented in code and submitted by the Friday evening deadline

Marking:

- in-class submission and demo attempt: 5 marks;
- finished product, including docs and algorithm: 5 marks.



Javadoc – Some Standards Class Document Comments

@author Describes or names the author

name used in the class

(reference)

@version
Version name giving the

version of the class, interface,

Package name or a class

@since Java compiler's version

@see

number used for compilation



Method Document Comments

Gives information on method input or parameter one for each parameter

*****@return

Gives the description of the return value



Important Tips

- Comment your code segments (designating functions, loops, etc.), local variables, and other relevant lines of code as may be deemed important.
- ❖ Javadocs generates documentation based on items included within /**.....*/
- Multiple comment lines can be commented using /*...*/
- Single lines of code can be commented using //.

Hint: Always use /**...*/ style in your code for this course.



Generate the Javadoc for your Program

- In Eclipse, click on Project on the top bar, and then scroll down to select Generate Javadoc
- In the window that appears, click on the Project for which Javadoc is required
- Check to see that the Javadoc command path is correct, otherwise click on configure and go to your Java folder in the Program Files and locate Javadoc.exe in the bin subdirectory
- Click the Finish button



Generate the Javadoc for your Program (2)

- To complete, should any other window pop up, click on Yes to All option.
- Locate the doc folder and check to see the content.

At this point, submit your Java code to Brightspace and go to your professor to demo your work to receive your marks!



Finalizing...

- Remember to submit by end of lab and demonstrate your work to lab professor to receive your mark
- Remember to review your hybrid task as specified for the week
- Remember to keep ahead by starting off the next lab (if available)



References

Amazon Corretto 11 Installation Instructions for Windows 7 or Later -Amazon Corretto

