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.

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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.

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Grading for Lab 1

❖ Grading for Lab 1 starts in Week #2.

❖ **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 your lab in your lab section that week.

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) 8u25, Amazon Corretto 11 or later

❖ **Part 2:** Correctly installed or updated the Eclipse Integrated Development Environment (IDE)

➢ Eclipse 4.4.1 (or later)

❖ **Part 3:** Correctly show **Javadoc output** using a simple example program created by you (see instructions).

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Your installation

❖ You may have already installed JDK/JRE on your computer or Amazon Corretto 11 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.

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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, 11 or later** 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_261 (example where the update number is 261).*

  ➢ *JRE 1.8_261 (example where the update number is 261).*

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.

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To Install JDK - Java Version 8

❖ Begin by closing out every open webpages to avoid conflicts

❖ Download JDK "jdk-8u341-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

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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 8u341 (*Standard Edition 8 update 341*)

❖ 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_341"

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

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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

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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 left-side 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

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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

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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%

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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 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 Parts 2 and 3

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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 plug-in system for making the environment customized

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Demonstrate that you installed Eclipse 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.

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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 (3)

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

➢ Write a **simple program** (use your _last name_ as the name of the program) in Java.

➢ In your program, implement user input for (and also show the output of) the following:
  o Your name
  o Student number
  o Two reasons why you are taking this course

Javadoc (2)

➢If your student number ends with an **odd** number:

    ➢Compute the remaining weeks till the end of your program and subtract 1 from the result.

➢ If your student number ends with an **even** number:

    ➢ Compute the number of the remaining months in the year 2022 and add 1 to the result.

Javadoc (3)

❖ In your program, **include Javadoc style comments in the sections** using appropriate symbols and sentences to provide details of your program.

❖ Use only <u>Javadoc style</u> comments for this part of the Lab.

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,

@see   Package name or a class

@since   Java compiler's version number used for compilation

Method Document Comments

❖ @param   Gives information on method input or parameter one for each parameter

❖ @return   Gives the description of the return value

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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, go to your professor to demo your work to receive your marks!

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Demoing your Lab

To demo your lab, your professor will **require you to do** the following:

❖ Close all open command prompt window and open a new window.

❖ At the command prompt, type:

   ❖ java –version

❖ Also type:

   ➢ Javac –version

❖ Then to show the PATH type:

   ➢ echo %JAVA_HOME%

❖ Show the output of your **Javadoc**

Finalizing…

❖ Remember to **demonstrate your work** to lab professor to receive your marks

❖ Remember to **review your hybrid task** as specified for the week

❖ Remember to **keep ahead** by starting off the next lab (if available)