WA2621 DevOps Foundations for Java with Git, Jenkins, and Maven

Classroom Setup Guide

Web Age Solutions

Table of Contents

Part 1 - Minimum Hardware Requirements

- 64 bits OS
- 2 cores
- 8 GB RAM
- 80 GB in the hard disk
- Internet access

Part 2 - Minimum Software Requirements

- Windows 8.1
- Firefox latest
- Chrome latest
- Adobe Acrobat Reader
- Zip extraction utility
- JDK 11.0.8 - 64 bits *
- Eclipse IDE-2020-03 *
- Maven 3.6.3 *
- Git 2.26.0 *
- Jenkins *
- Tomcat 9.0.8 *
- Notepad 7.5.6 ++ *
- Artifactory OSS 7.10.6*

* - indicates software provided as part of the courseware.

Part 3 - Software Provided

You will receive:

- **WA2621_REL_6_0.zip**

All other software listed under Minimum Software Requirements is either commercially licensed software that you must provide or software that is freely available off the Internet.

Part 4 - Instructions

__1. Login with an administrator account. NOTE. THIS COURSE REQUIRES ADMIN PRIVILEGES TO THE STUDENT ACCOUNT.

__2. Makes sure the computer has internet access from the browser and the command line. If needed open the proxy.

__3. Extract the **ZIP** file to **C:**

__4. Review that the following folders were created:

- **C:\LabFiles**
- **C:\Software**
- **C:\Software\apache-maven-3.6.3**
- **C:\Software\apache-tomcat-9.0.8**
- **C:\Software\artifactory-oss-7.10.6**
- **C:\Software\Jenkins-2.387.3-LTS-Windows**

__5. Review that the following files were created:

- **C:\Software\Eclipse-IDE-2020-03-eclipse-inst-win64.exe**
- **C:\Software\Git-2.26.0-64-bit.exe**
- **C:\Software\jdk-11.0.8_windows-x64_bin.exe**
- **C:\Software\npp.7.5.6.Installer.exe**

__6. Install Mozilla.

__7. Install Chrome.

__8. Make Chrome the default browser.

Part 5 - Privileges to Users

During the labs students will require privileges on several directories. They will need to be able to write, read, and modify files in these directories for the labs. Although the directions below are provided as an example, this may differ depending on Windows version. The important thing is to make sure students have full permissions on the folders below or they may not be able to accomplish some labs.

- **C:\Software**
- **C:\LabFiles**
- **C:\Workspace**

__1. Create the user that the students will use during the class.

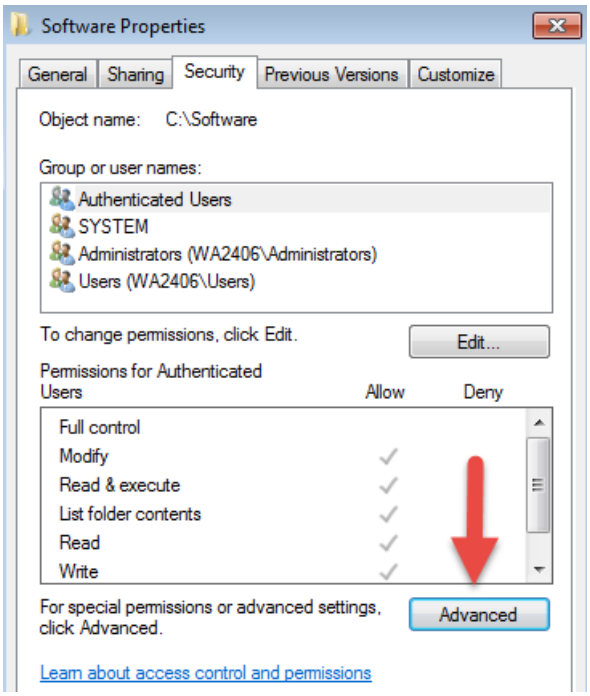
__2. Give the student user account administrative rights. During the labs the student requires this to install software.

__3. Open Windows Explorer.

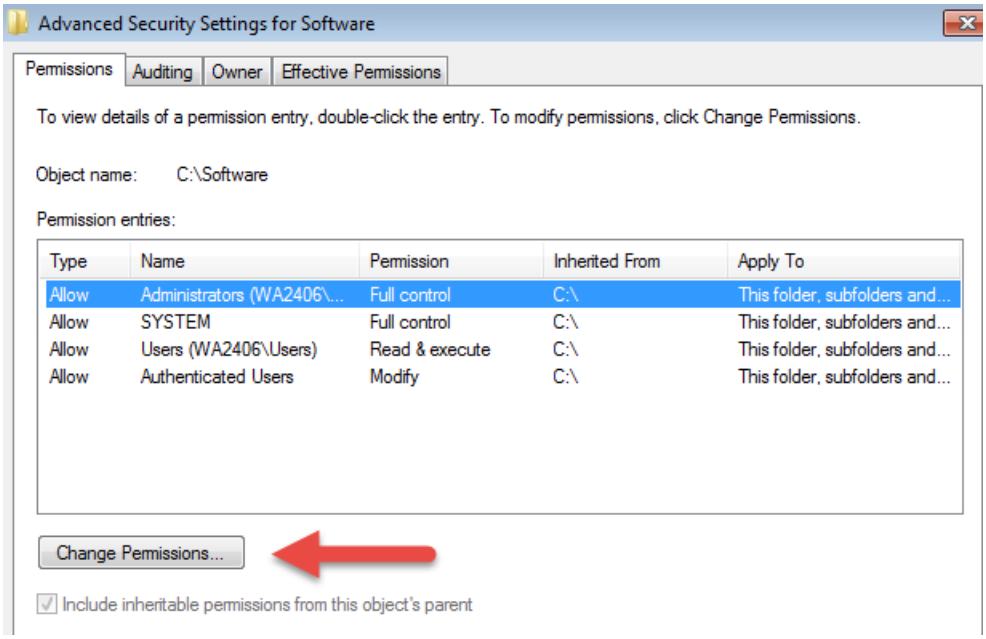
__4. Right click C:**Software** and select **Properties**.

__5. Click the **Security** tab.

__6. Click **Advanced**.

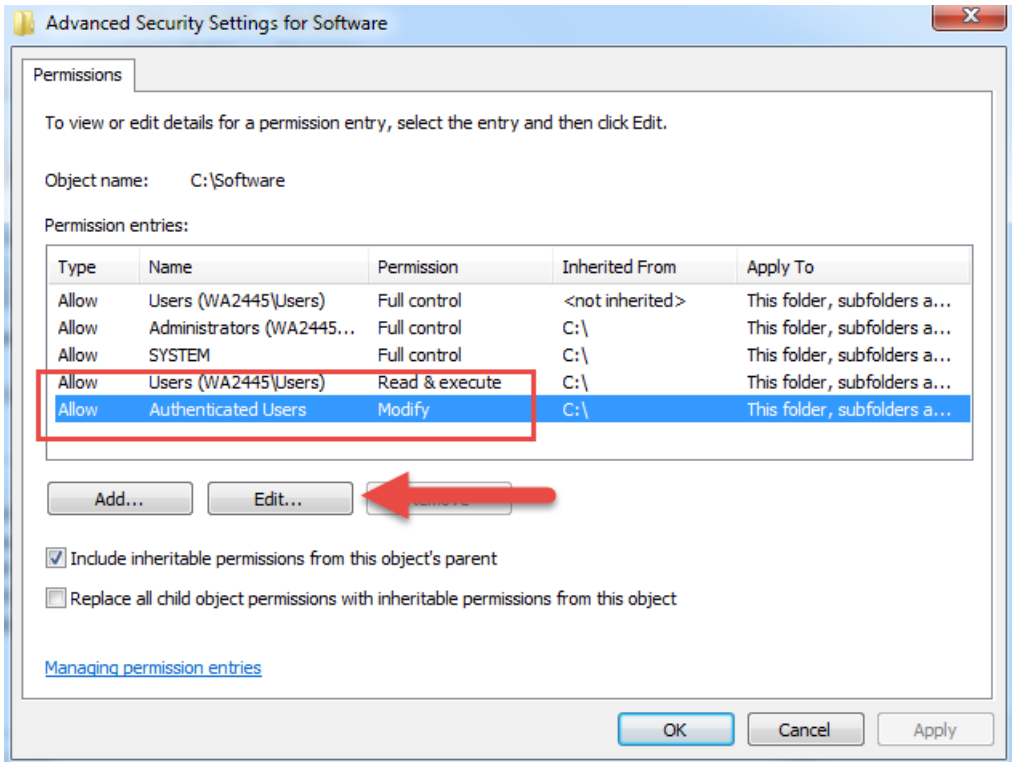


__7. Click **Change Permissions**.

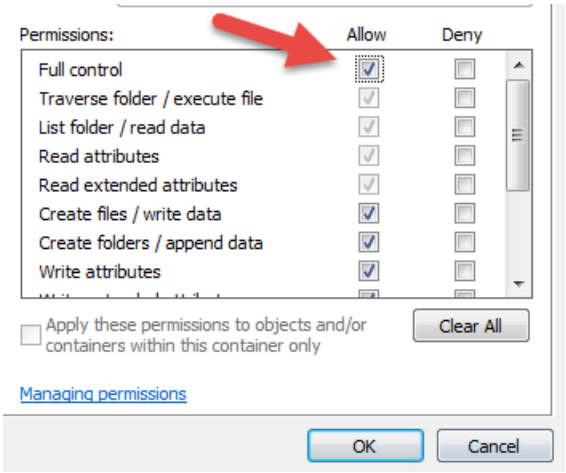


__8. Select the **Authenticated Users** entry and click **Edit…**

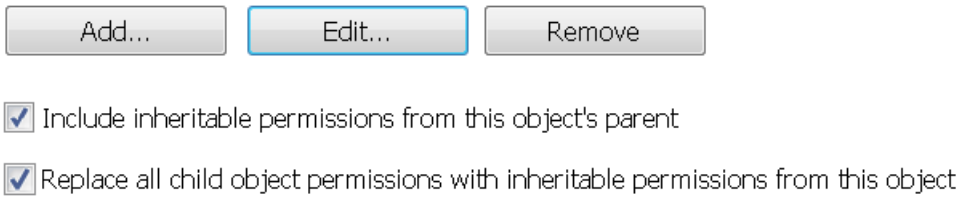
Note. If you don't have a domain in your environment the select **Users** instead Authenticated Users.



__9. Check the **Allow** checkbox to the right of **Full Control** and click **OK**.



__10. Select the checkbox for **Replace all child permissions with inheritable permissions from this objects** and then click **OK**.



__11. A *Windows Security* dialog will open. Click **Yes**.

__12. Wait until Windows finishes updating security.

__13. Back in the *Advanced Security Settings* dialog, click **OK**.

__14. Back in the *Properties* dialog, click **OK**.

__15. Do the same steps to the **C:\LabFiles** folder.

__16. Create a folder called **C:\Workspace** if its not already created.

__17. Do the same steps to the **C:\Workspace** folder.

Part 6 - Installing JDK 11.0.8 - 64 bit

__1. Make sure there is no previous Java version already installed on the system. You can check this by using the Windows "Add/Remove Programs" utility. For the best compatibility with the labs it is suggested that all previous versions of Java be uninstalled before proceeding with these instructions. If this is an issue, please contact the setup support person for the course.

__2. From the **C:\Software** directory run the following file:

```
jdk-11.0.8_windows-x64_bin.exe
```

Note: If using prompted by a security prompt allow the installation to continue.

__3. When the Welcome page of the setup appears, press the **Next** button.

__4. Leave the defaults for installation location and options, and press the **Next** button.

The installation will begin installing files. Wait until the software is completely installed.

__5. Click **Close**.

Set the Environment variables

__1. Open a Command Prompt. You can do this with '**Start → Programs → Accessories → Command Prompt**'.

__2. Use the 'cd' command to attempt to switch to the following directory. This will verify the presence of a directory used later so make sure you do not get any errors about not being able to "find the path specified".

```
cd C:\Progra~1\Java\jdk-11.0.8
```

Note: The installation directory may be slightly different depending your operating system. You may need to use the following directory instead of the one listed above:

C:\Progra~2\Java\jdk-11.0.8

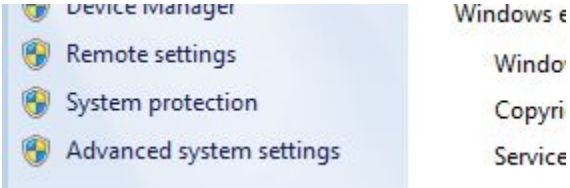
Some of the remaining steps will use the slightly different directory.

__3. Make sure you can reach the java folder and remember the value entered because you will use this value in the following steps.

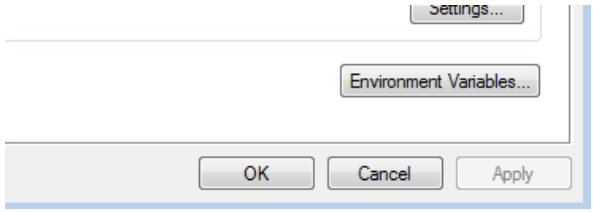
__4. Close the command prompt window.

__5. Open the system properties. The way to do this varies slightly by Windows version. The easiest way is often to open a File Explorer window, right click on the 'This PC' shortcut and select '**Properties**'

__6. Click on **Advanced system settings**.



__7. The system will display the **System Properties** dialog. Select the **Advanced** tab and click **Environment Variables**.



__8. Under the **System Variables** list, click the **New** button.

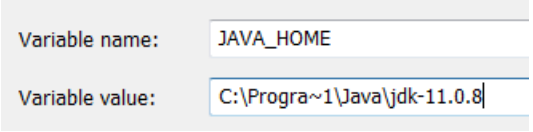
__9. As Variable name enter:

```
JAVA_HOME
```

__10. As Variable value enter the following. This should be the value you verified before.

```
C:\Progra~1\Java\jdk-11.0.8
```

__11. Click **OK** to create the variable.

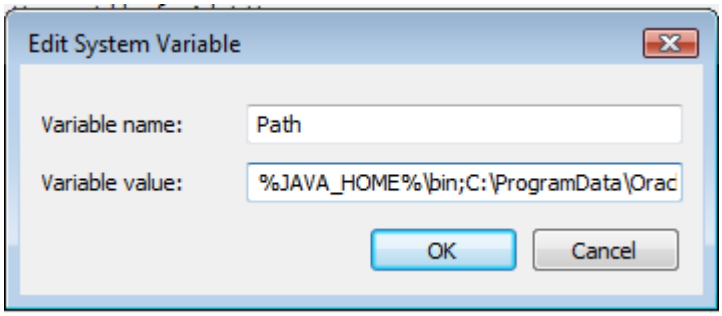


__12. From the *System Variables* list, select **Path** and click **Edit**.

__13. At the beginning of the line enter the following. Make sure to include the semi-colon on the end:

```
%JAVA_HOME%\bin;
```

__14. Click **OK**.



__15. Click **OK** to close the *Environment Variables* window.

__16. Click **OK** to close the *System Properties* window.

Verification

__1. Open a Windows command prompt. You can do this by selecting '**Start -> Run**', entering '**cmd**', and then pressing the **OK** button. Make sure it is a new command prompt and not one open previously.

__2. Enter the following command:

```
echo %PATH%
```

Make sure you see the Java 'bin' directory listed at the beginning.

__3. Enter the following command:

```
java -version
```

Make sure you see the response shown below.

```
C:\Users\wasadmin>java -version
java version "11.0.8" 2020-07-14 LTS
Java(TM) SE Runtime Environment 18.9 (build 11.0.8+10-LTS)
Java HotSpot(TM) 64-Bit Server VM 18.9 (build 11.0.8+10-LTS, mixed mode)
```

Troubleshooting: If you get an error message means that your Environment variable was incorrectly entered, go back and fix the values.

__4. Enter the following command:

```
javac
```

Verify that you get the options to run the Java compiler:

```
C:\>javac
Usage: javac <options> <source files>
where possible options include:
  @<filename>                  Read options and filenames from file
  -Akey[=value]                Options to pass to annotation proces
  --add-modules <module>(,<module>)*
        Root modules to resolve in addition to the initial modules,
        on the module path if <module> is ALL-MODULE-PATH.
```

__5. Enter the following command:

```
java -XshowSettings:all 2>&1 | findstr /c:"sun.arch.data.model"
```

Verify that it displays the correct value of 64. This indicates that it is 64-bit java that is installed.

__6. Close the command prompt window and any extra windows that are open.

You have completed Java installation.

Part 7 - Installing Eclipse-IDE-2020-03

__1. Open C**:\Software**

__2. Double click in this file to install eclipse:

```
Eclipse-IDE-2020-03-eclipse-inst-win64.exe
```

__3. Select **Eclipse IDE for Enterprise Java and Web Developers**.

__4. Enter the **Installation folder** as **C:\Software**

Note that Java version may vary.

__5. Click **Install**.

__6. Click **Accept Now**.

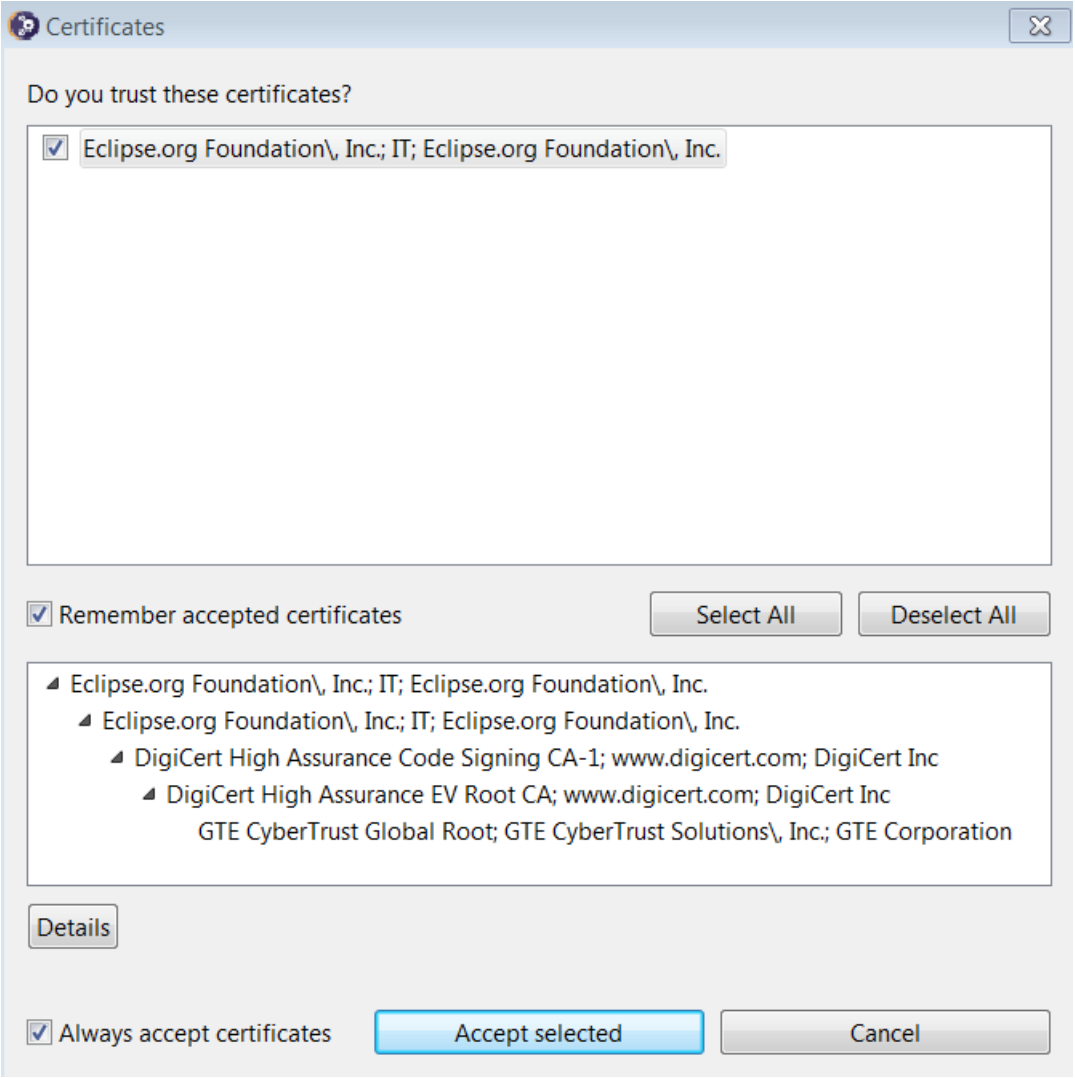
The installation will start and may take a while.

__7. In the Certificates page, click **Select All**.

__8. You may see a pop-up message about the installation is taking longer. Just close that pop-up.

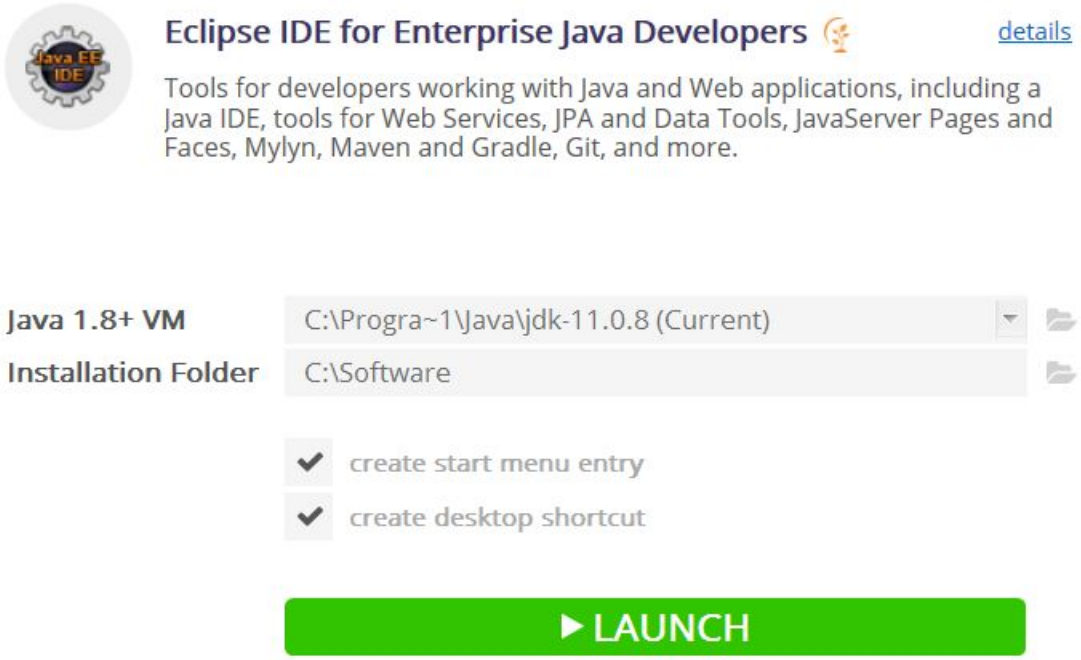
__9. Check the boxes for **Remember accepted certificates**.

__10. Check the boxes for **Always accept certificates**.



__11. Click **Accept selected** to continue with the installation.

__12. Finally it will finish installing eclipse. Click **Launch**.



Eclipse will start.

__13. Change the workspace directory to **C:\Workspace** and click **Launch**.

__14. Eclipse will open showing the Welcome page. Close the page by clicking on the X in the tab.

__15. From the menu, select **File > Exit** to close Eclipse.

You have completed Eclipse installation.

Part 8 - Install Jenkins 2.387.3 LTS Windows

__1. Open a command prompt window and ensure that the Java JDK is installed.

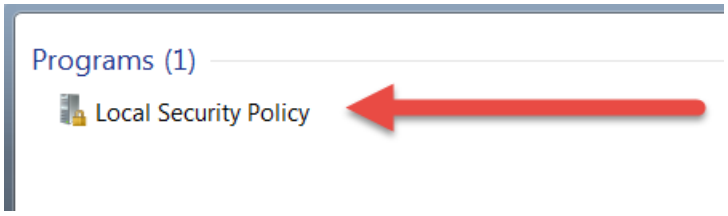
```
java -version
```

__2. If you are using a computer where possibly Jenkins was used before then delete the following folders in case they exist:

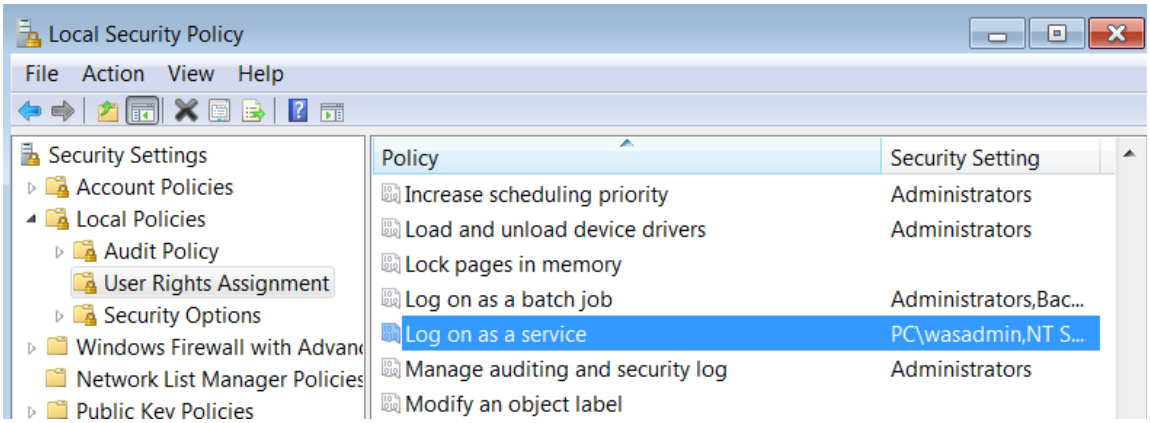
```
C:\Program Files\Jenkins
C:\Program Files(x86)\Jenkins
C:\Users\<username>\.m2
```

__3. Make Chrome your default browser and make sure the latest Chrome version is installed.

__4. Before installing Jenkins you need to make sure that the user using Jenkins have the privileges to start a Service. To do that, from the star menu, start typing **Local Security** and the **Local Security Policy** will show up. Click on it. On **Windows 8/10** search for **secpol.msc** and click on it.



__5. Expand **Local Policies > User Rights Assignment** and double click on **Log on as a service** on the right panel.

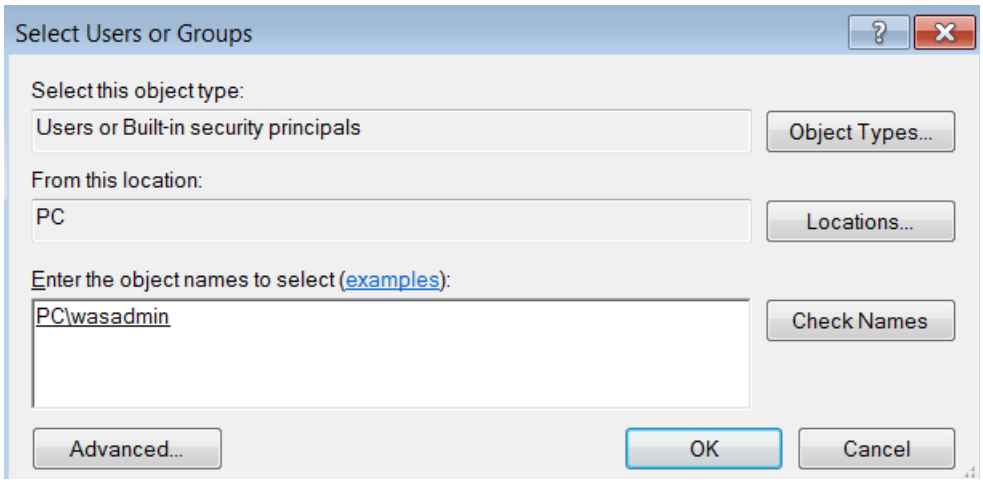


__6. Click **Add User or Group**.

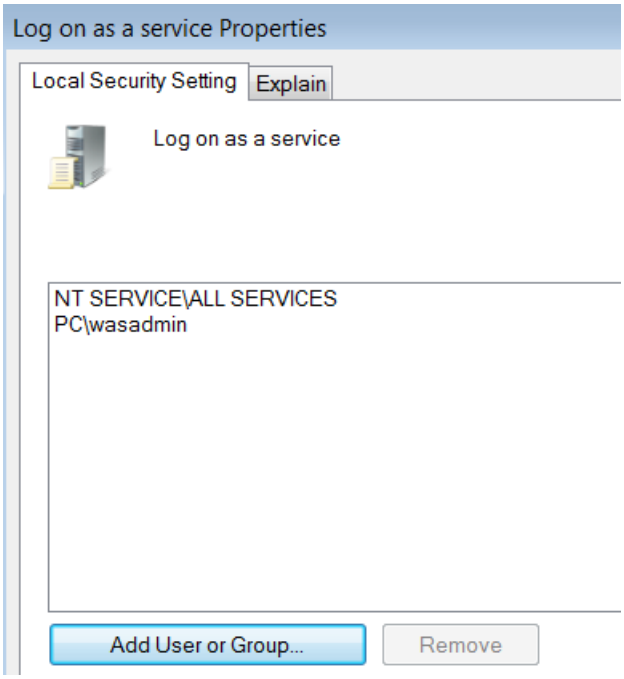
__7. Enter the name of the user that the students will use to do the Labs.

__8. Click **Check Names** to verify is the correct user.

__9. Click **OK**.



__10. You will see your user listed in this example 'wasadmin'. Click **OK**.



__11. In Windows Explorer, navigate to:

```
C:\Software\Jenkins-2.387.3-LTS-Windows
```

__12. Double-click on:

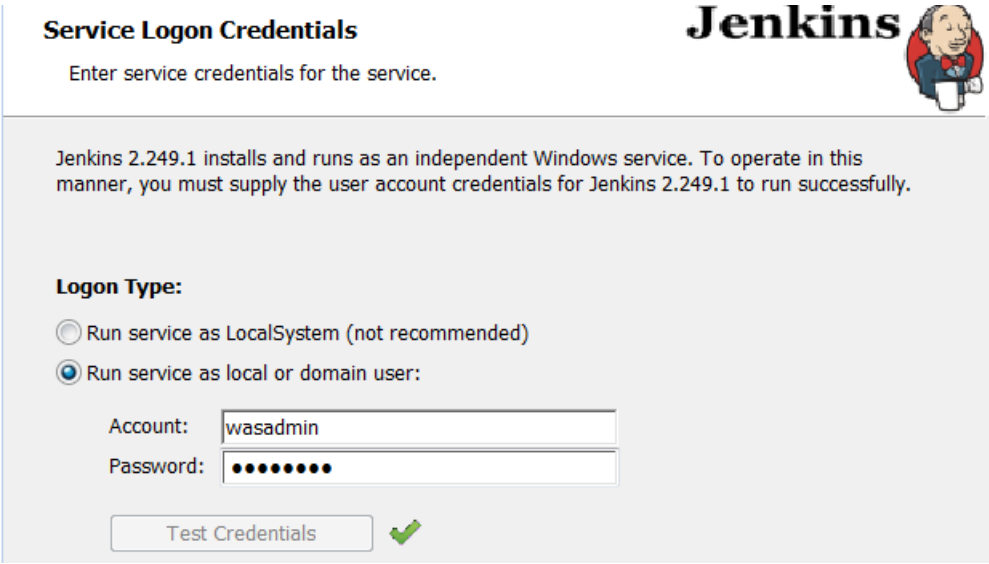
```
jenkins.msi
```

The installer will show the initial dialog.

__13. Click **Next**.

__14. On the **Destination Folder** panel, leave the defaults and click **Next**.

__15. Select **Run service as local or domain user** and enter your **user / password** and click **Test Credentials**. Make sure the test passes.



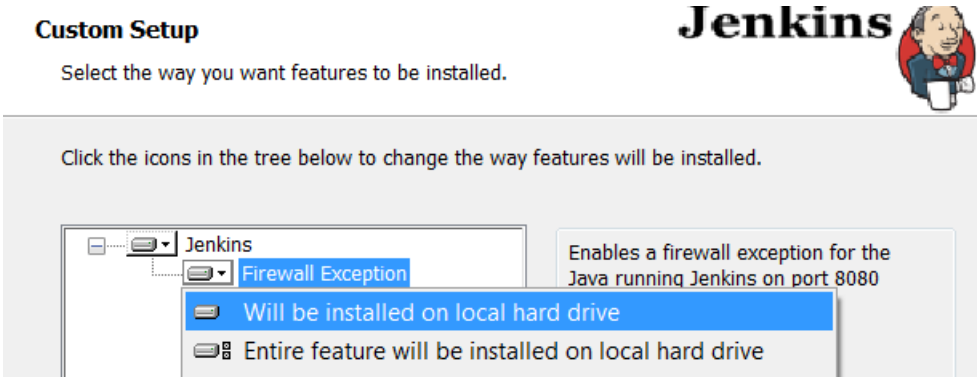
__16. Click **Next**.

__17. Click **Test Port** and make sure it works fine.

__18. Click **Next**.

__19. Leave the default **Java home directory (JDK or JRE)** and click **Next**.

__20. Click on **Firewall Exception** and select **Will be installed on local hard drive**.



__21. Click **Next**.

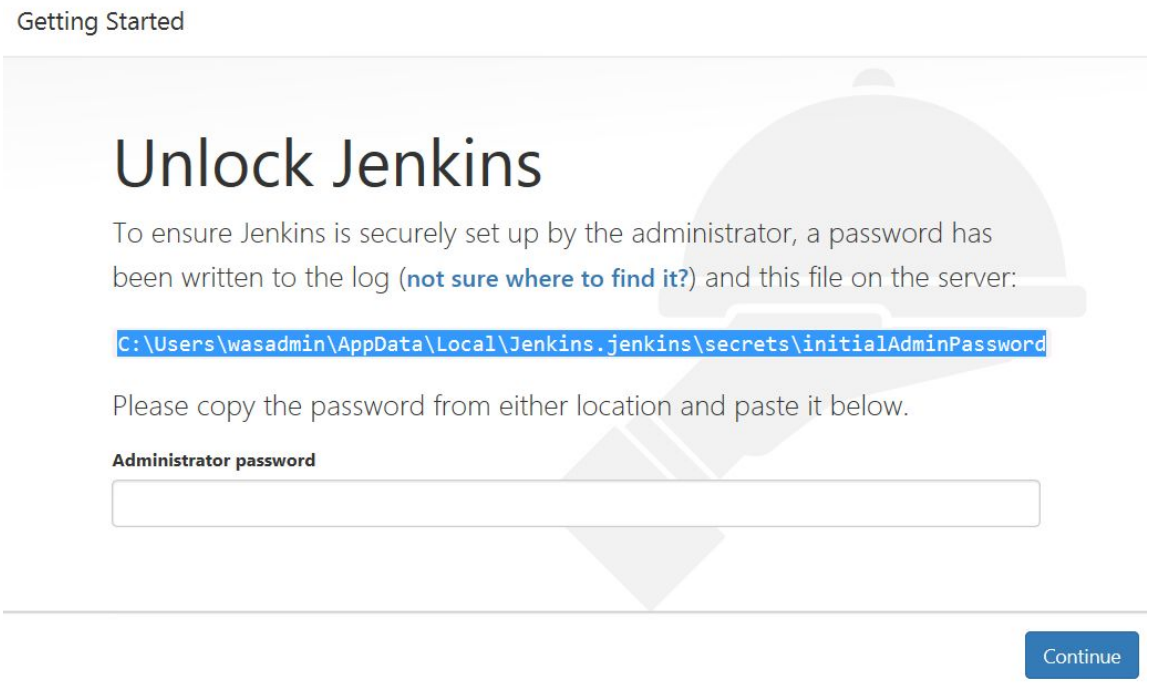
__22. On the **Ready to Install...** page, click **Install**.

__23. Windows may show a security dialog. If it does, click **Yes**.

__24. In the final dialog panel, click **Finish**.

The installer will open the default browser window to the Jenkins home page. The page shows the location of a file where you can find the initial administration password, and also a text box to enter the password into.

__25. Open Mozilla and enter **localhost:8080**

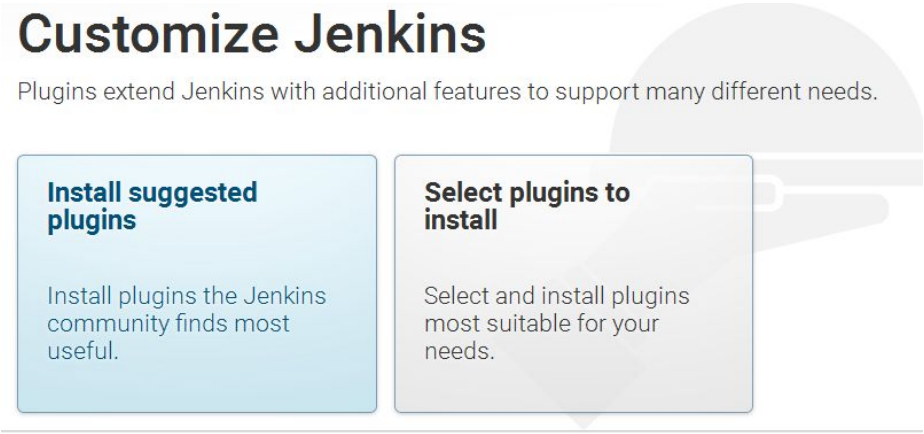


__26. Open the indicated file with an editor such as Notepad, and copy the password to the clipboard with Ctrl-C.

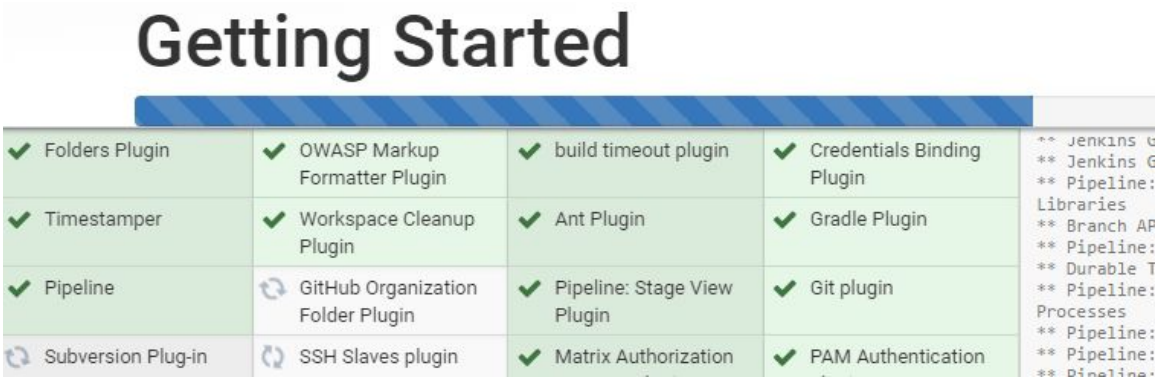
__27. Paste the password into the **Administrator Password** box and click **Continue**.

__28. If you are prompted to save the password just close that window.

__29. Click on **Install Suggested Plugins**.



Getting Started will begin. Wait until is done.



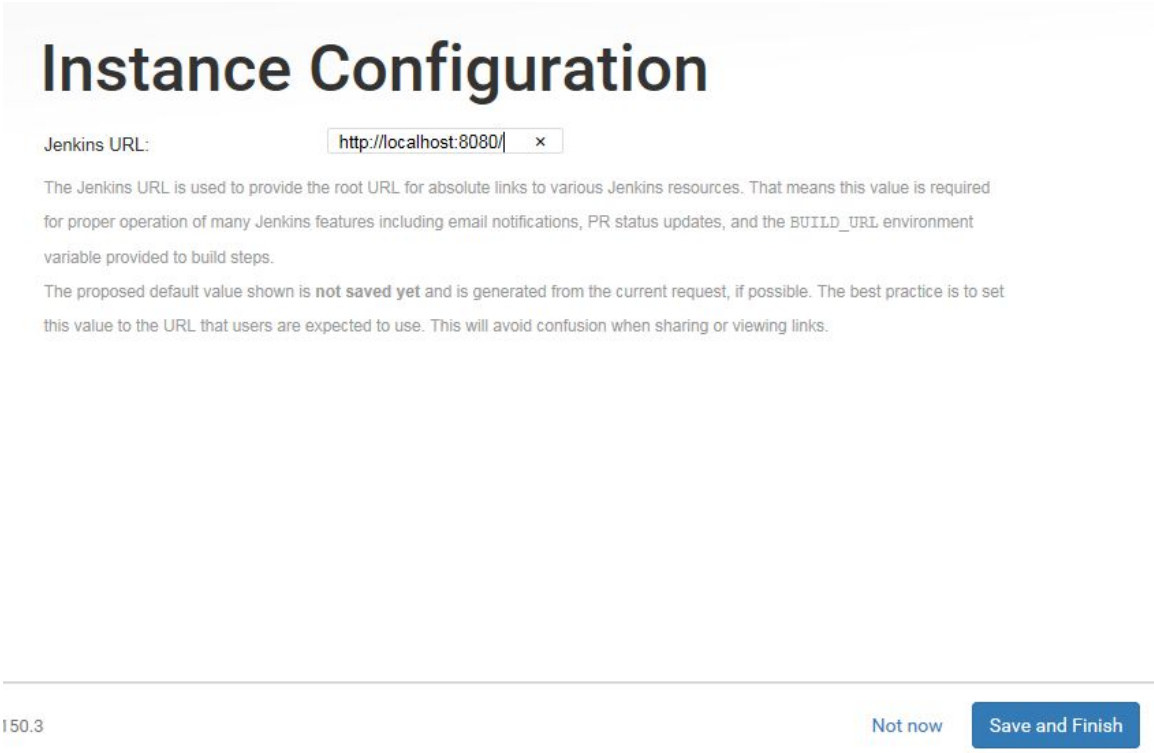
In case a plugin failed to be installed, you can retry or click Continue.

__30. In the **Create First Admin User** screen. Enter the following fields:

Username:	wasadmin
Password:	wasadmin
Confirm Password:	wasadmin
Full name:	Administrator
E-mail address:	wasadmin@wasadmin.com

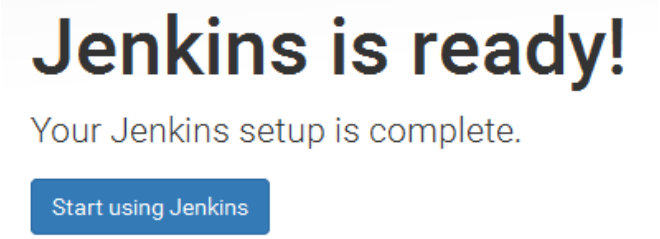
__31. When the input looks like below, click **Save and Continue**.

__32. Instance Configuration page will open, just click **Save and Finish**.

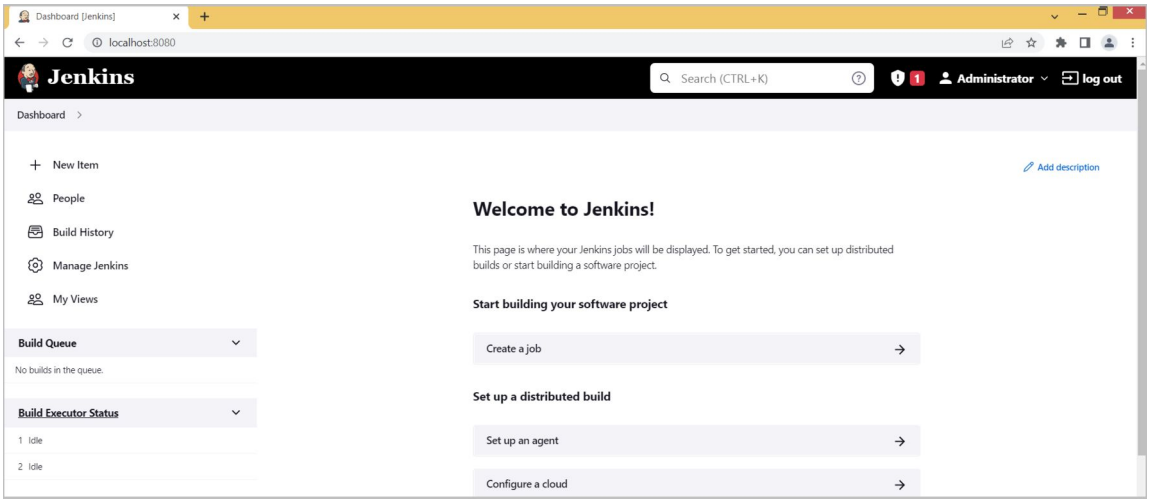


__33. If you are prompted to save the password just close that window.

__34. You will see that Jenkins is ready. Click **Start using Jenkins**.



Jenkins will open.



__35. Jenkins installation is complete. Close the browser.

__36. Edit the following file with notepad or similar text editor:

`C:\Program Files\Jenkins\Jenkins.xml`

__37. Find this line:

```
<arguments>-Xrs -Xmx256m -Dhudson.lifecycle=hudson.lifecycle.WindowsServiceLifecycle -jar
"C:\Program Files\Jenkins\jenkins.war" --httpPort=8080 --webroot="%LocalAppData%\Jenkins\
war"</arguments>
```

__38. Insert the following text **before** the first "-Dhudson ...":

`-Dhudson.plugins.git.GitSCM.ALLOW_LOCAL_CHECKOUT=true`

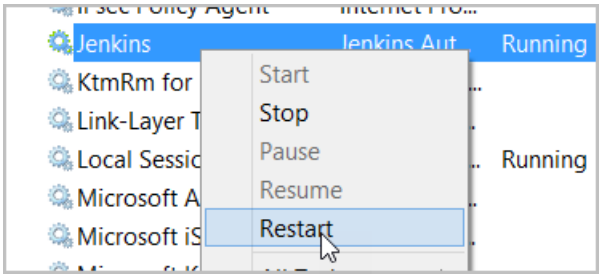
__39. The updated line will look like this:

```
<arguments>-Xrs -Xmx256m -Dhudson.plugins.git.GitSCM.ALLOW_LOCAL_CHECKOUT=true
-Dhudson.lifecycle=hudson.lifecycle.WindowsServiceLifecycle -jar "C:\Program
Files\Jenkins\jenkins.war" --httpPort=8080 --webroot="%LocalAppData%\Jenkins\
war"</arguments>
```

__40. Save and close the file.

__41. Open Services.

__42. Restart Jenkins.



__43. Open Mozilla and go to Jenkins homepage:

http://localhost:8080/

__44. Login using **wasadmin** for user and password.

__45. Make sure login Jenkins is successful and you can see the home page.

__46. Close all.

Part 9 - Installing Maven 3.6.3

The following steps are based on Windows 7, other Windows versions instructions may vary.

__1. In the Windows Start Menu, right-click on the **Computer** link in the right-hand side of the Start panel, and then select **Properties**.

__2. Click on **Advanced system settings**.

__3. The system will display the **System Properties** dialog. Select the **Advanced** tab and click **Environment Variables**.

__4. Verify there is a JAVA_HOME variable.

__5. In the 'System Variables' panel, locate the entry for '**Path**' and double-click on it.

__6. Add the following to the **end** of the **Variable Value** field (including the semi-colon)

```
;C:\Software\apache-maven-3.6.3\bin
```

__7. Click **OK** on the variable editor dialog.

__8. Click **OK** on the **Environment Variables** dialog.

__9. Click **OK** in the **System Properties** dialog.

__10. Open a command prompt window.

__11. In the command window, type:

```
mvn -version
```

__12. Verify the version is 3.6.3 as shown below:

__13. Close all.

Part 10 - Installing Git 2.26

IMPORTANT: Setup is easy but you need to make sure you do the change in Step 8.

__1. From the **C:\Software** directory run the following file:

```
Git-2.26.0-64-bit.exe
```

__2. You may need to allow the program to run.

__3. In the Information page, click **Next**.

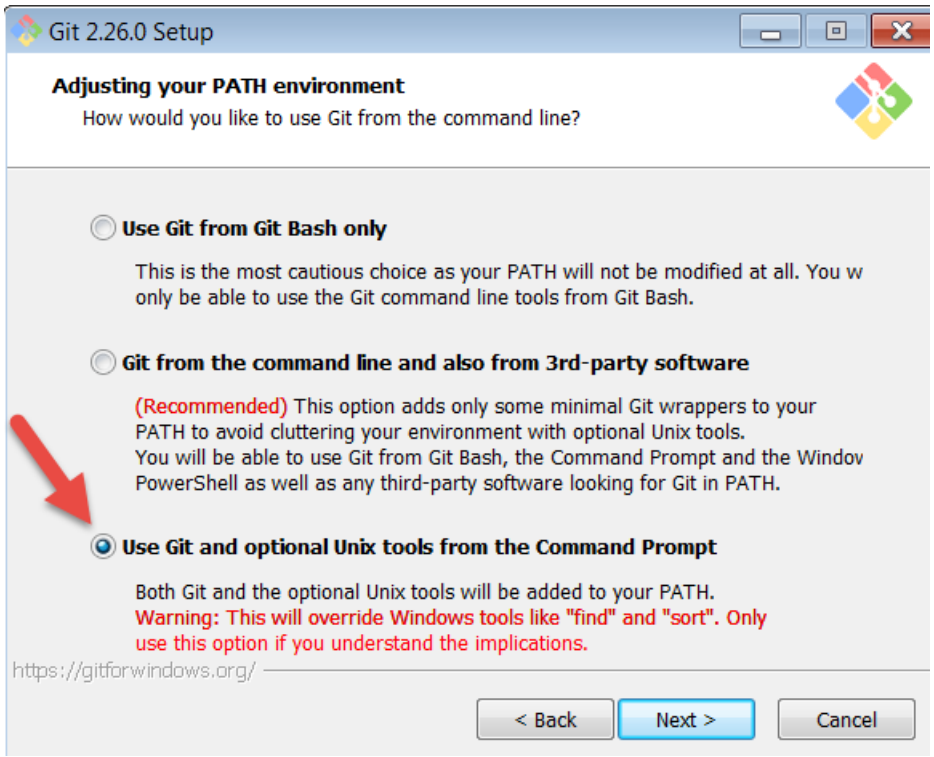
__4. In the Select Destination Location page, leave defaults and click **Next**.

__5. In the Select Components page, leave defaults and click **Next**.

__6. In the Select Start Menu Folder page, leave defaults and click **Next**.

__7. In the Choosing the default editor used by Git page, leave defaults and click **Next**.

__8. In the Adjusting your PATH environments page, select **Use Git and Optional Unix tools from the Windows Command Prompt**.



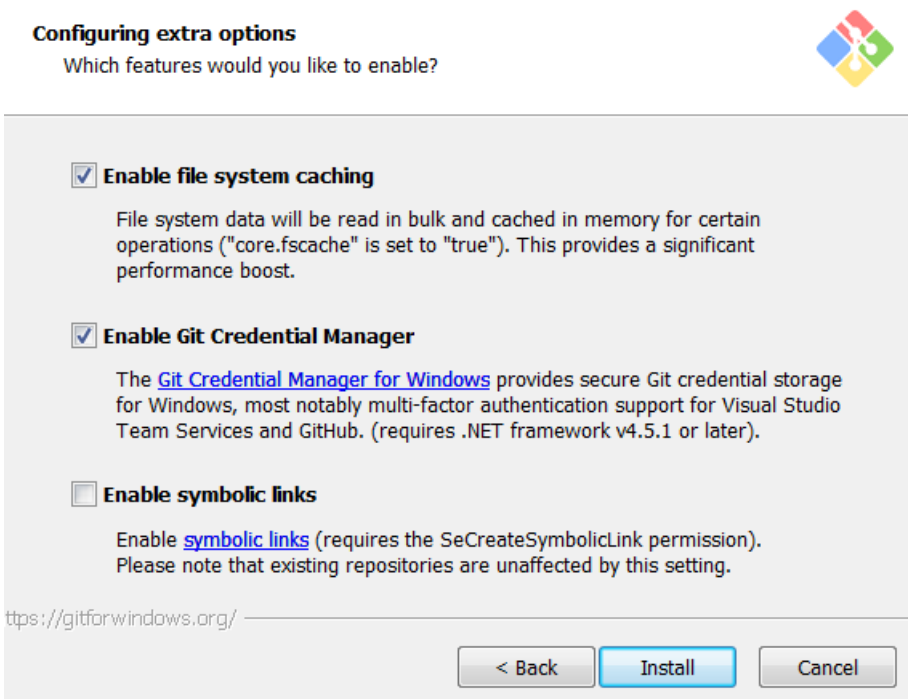
__9. Make sure you select the 3rd option as shown above and then click **Next**.

__10. In the Choosing HTTP transport backend page, leave defaults and click **Next**.

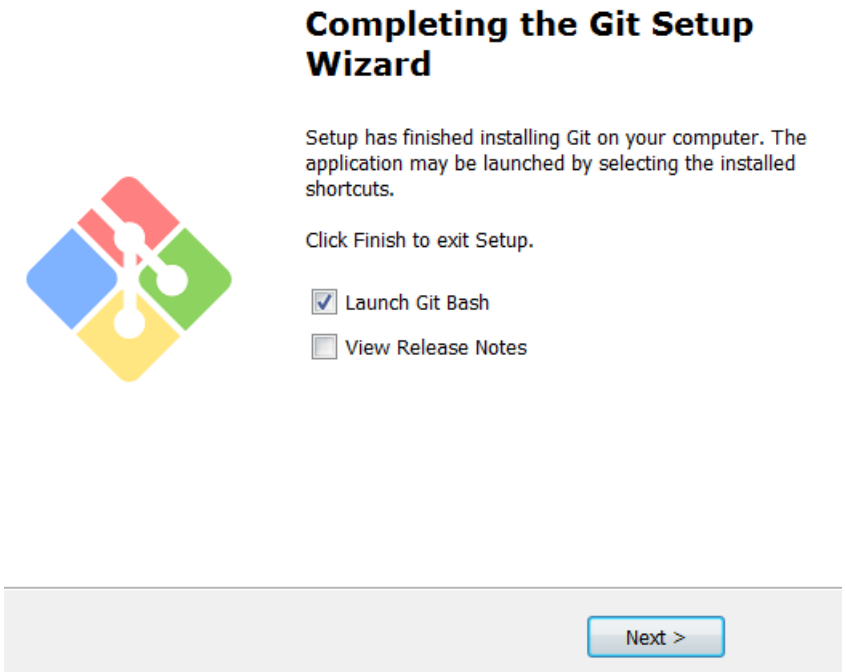
__11. In the Configuring the terminal emulator to use with Git Bash page, leave defaults and click **Next**.

__12. In the Configuring the line ending conversions page, leave defaults and click **Next**.

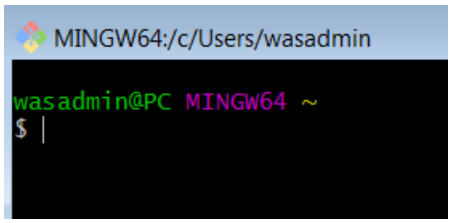
__13. Finally, in the Configuring extra options page, leave defaults and click **Install**.



__14. Check the box for **Launch Git Bash** and Click **Next**.



__15. You will see a Terminal Git window like below.



__16. Close all.

You have completed GIT installation.

Part 11 - Verification of Apache Tomcat 9.0.8

__1. Open a command prompt window.

__2. Change to the following directory:

```
cd C:\Software\apache-tomcat-9.0.8\bin
```

__3. Run the command:

```
startup.bat
```

__4. Windows Security Alert may open. Click **Allow Access**.

__5. Apache will start in a new window.

__6. Open another command prompt window.

__7. Change to the following directory:

```
cd C:\Software\apache-tomcat-9.0.8\bin
```

__8. Run the command:

```
shutdown.bat
```

__9. Apache will stop and the window where it was running will close.

__10. Close All command prompts.

Part 12 - Artifactory 7.10.6

__1. Open a file browser to **C:\Software\artifactory-oss-7.10.6\app\bin**

__2. Double click on the following file:

```
artifactory.bat
```

__3. A command prompt window will open, wait until you see a similar message like this:

```
leHandlerBase:342] [c-default-executor-0] - [ACCESS BOOTSTRAP] Saved new root certificate at: C:\Sof
tware\artifactory-oss-7.10.6\var\etc\access\keys\root.crt
2020-11-20T14:18:40.551Z ←[1;33m[jfac ]←[0;39m ←[34m[INFO ]←[0;39m [                ] [CertificateFi
leHandlerBase:196] [c-default-executor-0] - Finished loading root certificate from database.
2020-11-20T14:18:40.553Z ←[1;33m[jfac ]←[0;39m ←[34m[INFO ]←[0;39m [                ] [CertificateFi
leHandlerBase:187] [c-default-executor-0] - Loading ca certificate from database.
2020-11-20T14:18:40.617Z ←[1;33m[jfac ]←[0;39m ←[34m[INFO ]←[0;39m [                ] [CertificateFi
leHandlerBase:342] [c-default-executor-0] - [ACCESS BOOTSTRAP] Saved new ca certificate at: C:\Softw
are\artifactory-oss-7.10.6\var\etc\access\keys\ca.crt
2020-11-20T14:18:40.621Z ←[1;33m[jfac ]←[0;39m ←[34m[INFO ]←[0;39m [                ] [CertificateFi
leHandlerBase:196] [c-default-executor-0] - Finished loading ca certificate from database.
2020-11-20T14:18:53.839Z ←[1;32m[jfrt ]←[0;39m ←[34m[INFO ]←[0;39m [31fb607d2682417f] [a.e.EventsLog
CleanUpService:59] [art-exec-6          ] - Starting cleanup of old events from event log
2020-11-20T14:18:53.851Z ←[1;32m[jfrt ]←[0;39m ←[34m[INFO ]←[0;39m [31fb607d2682417f] [a.e.EventsLog
CleanUpService:81] [art-exec-6          ] - Cleanup of old events from event log finished
```

__4. Navigate to the following URL using Mozilla browser:

```
http://localhost:8081
```

You should be able to see the home page as below:

__5. Close the browser and the command prompt window.

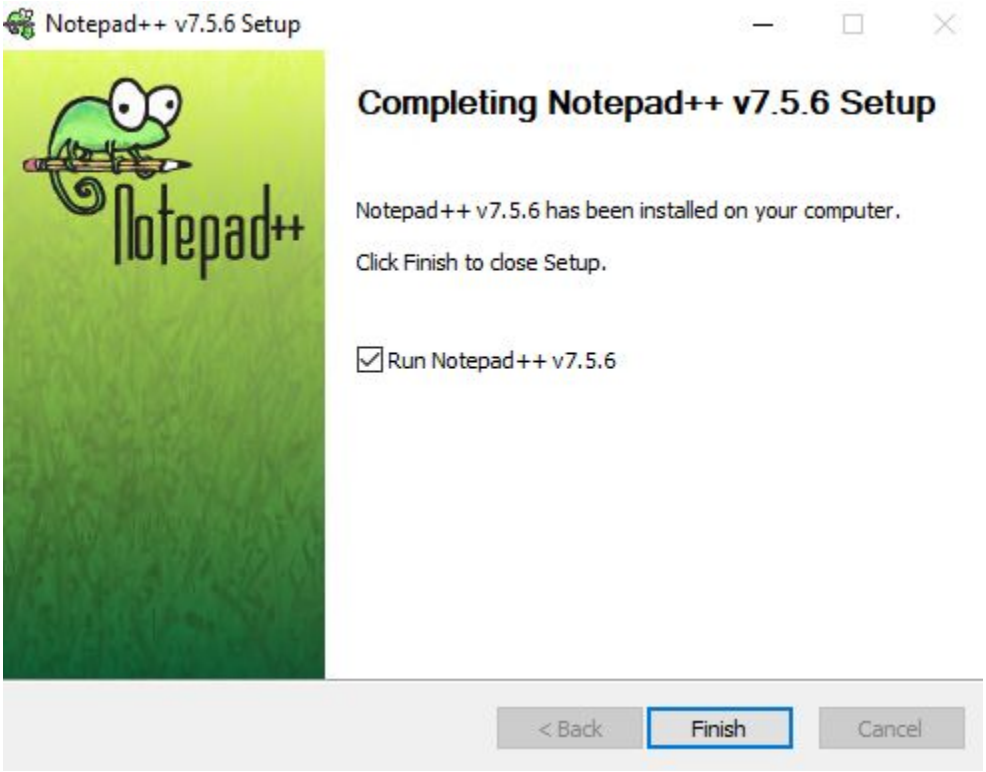
Part 13 - Installing Notepad Plus 7.5.6

__1. Open **C:\Software** and execute:

```
npp.7.5.6.Installer.exe
```

__2. Click Yes to allow to install it and follow default steps.

__3. Click **Finish** when the installation is completed.



__4. Close all.

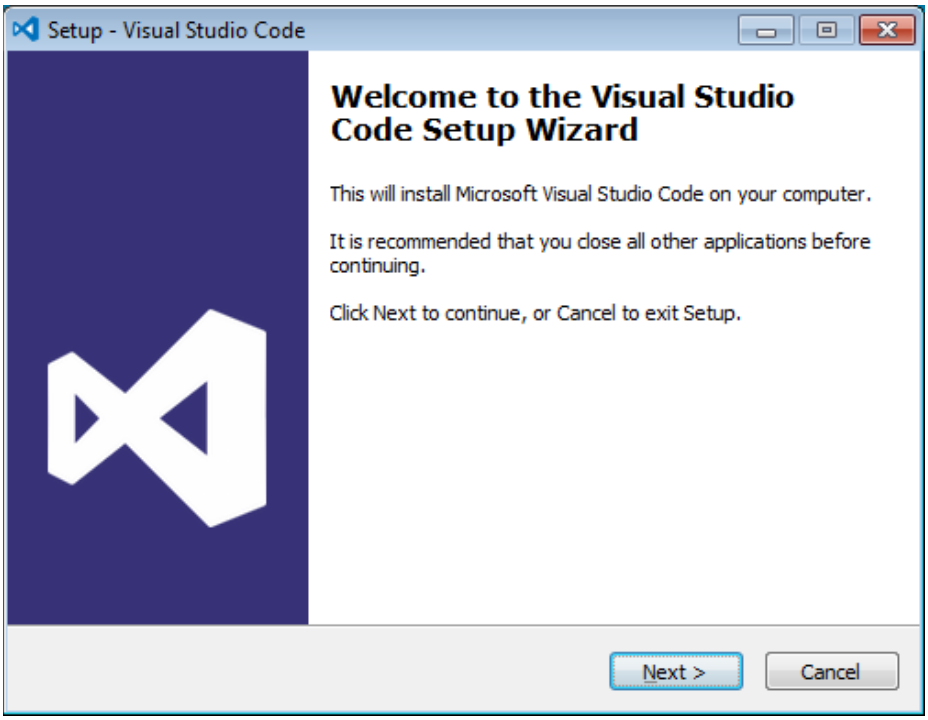
Part 14 - Installing Visual Studio Code

__1. Download the latest VScode for Windows (stable build installer) from the following site:

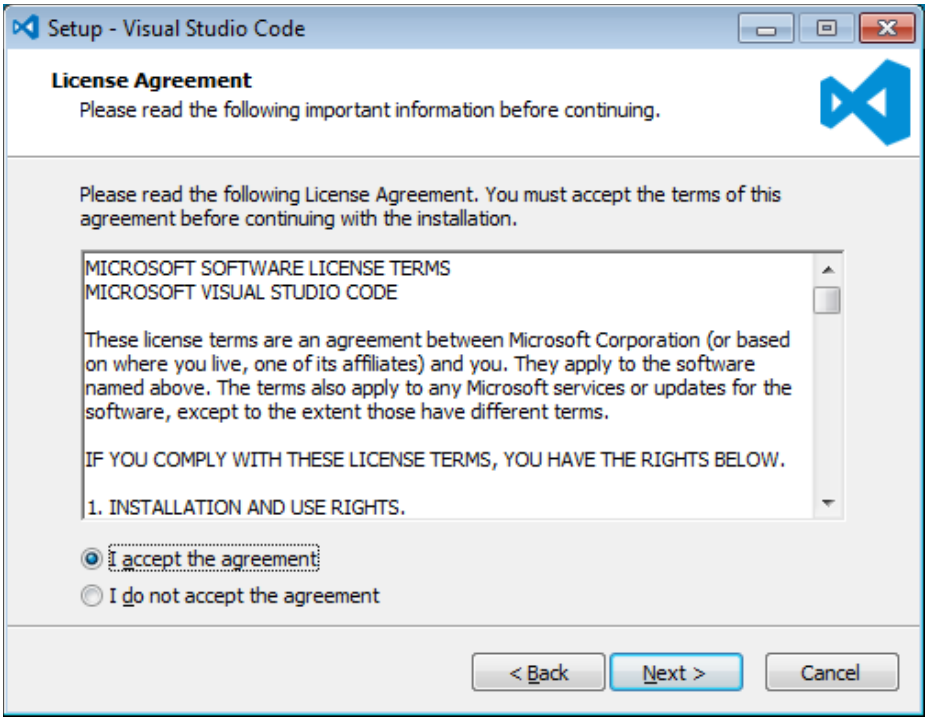
`https://code.visualstudio.com/`

__2. Run the downloaded installer to begin the installation.

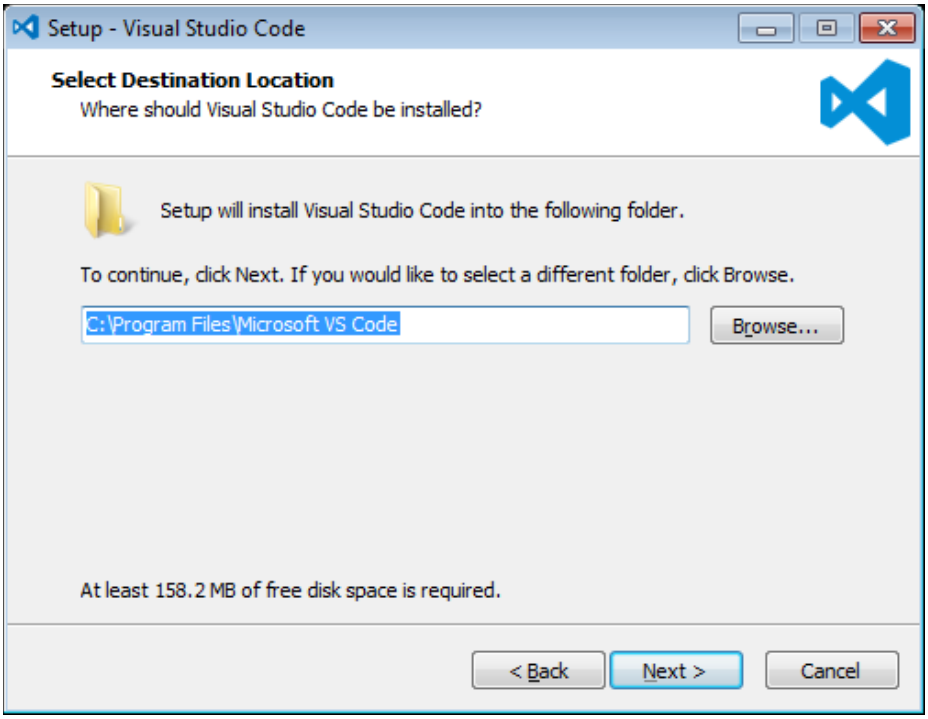
__3. Click **Next** on the welcome screen.



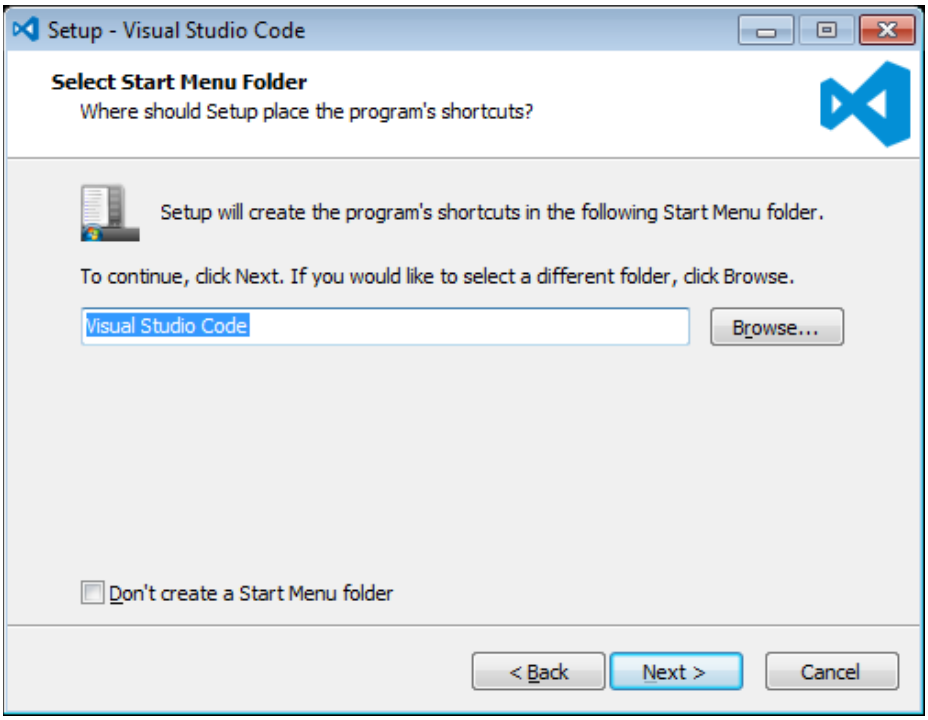
__4. Check **I accept the agreement...** and click **Next**.



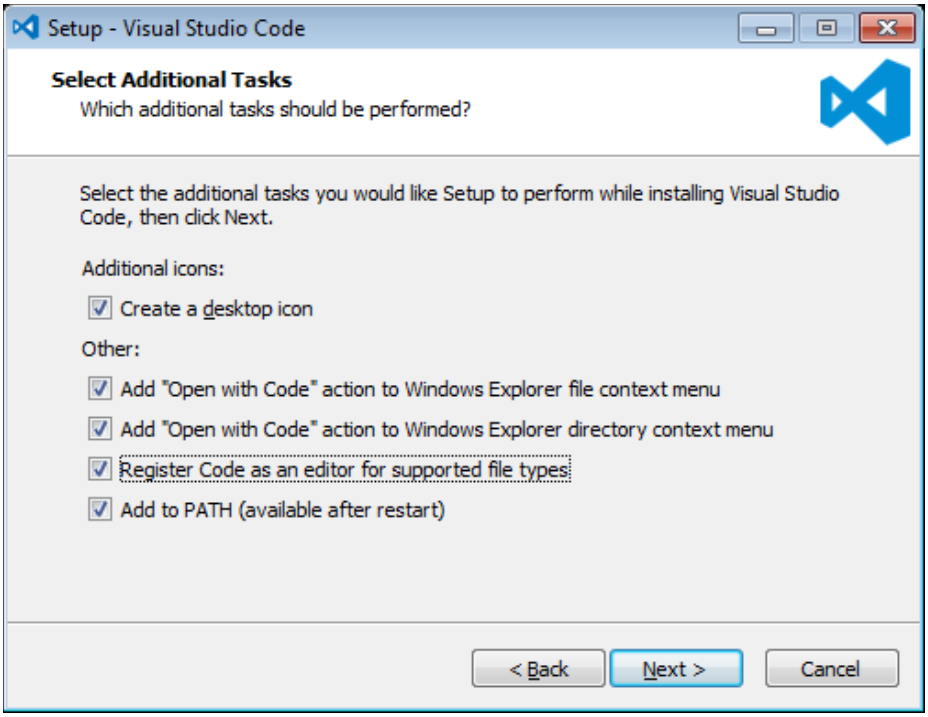
__5. Leave the default installation location and click **Next**.



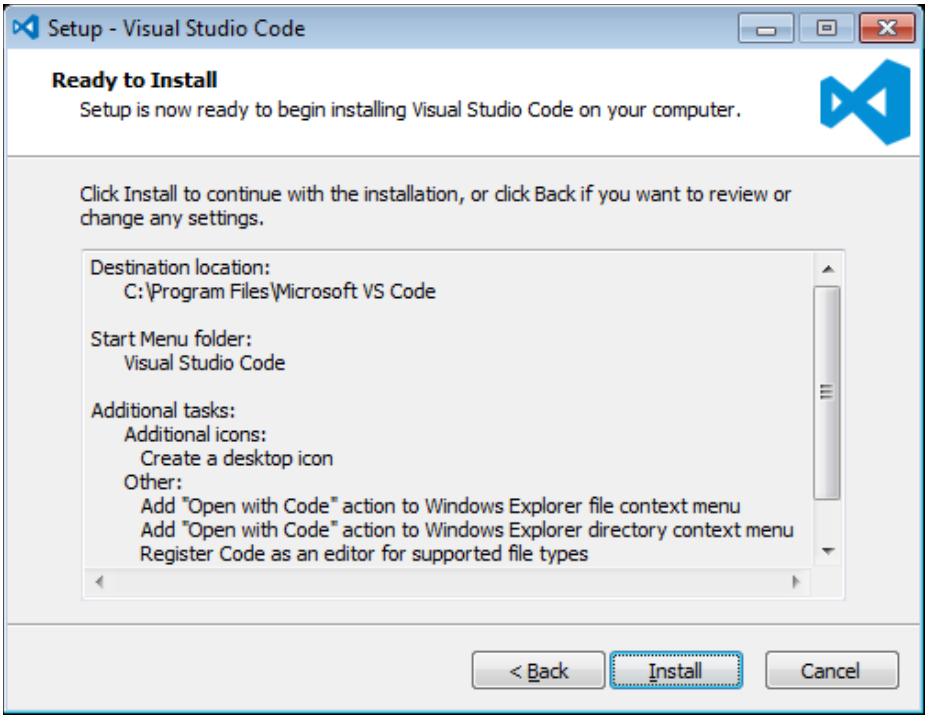
__6. Leave the default start menu folder and click **Next**.



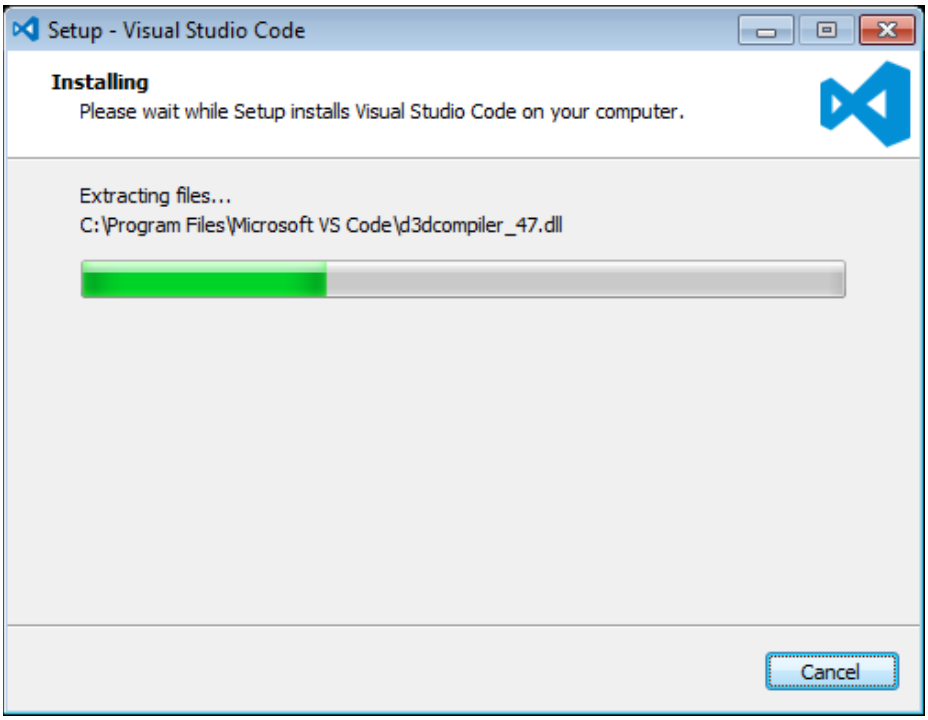
__7. Put a check mark on all items under Additional Tasks and click **Next**.



__8. Now click **Install**.



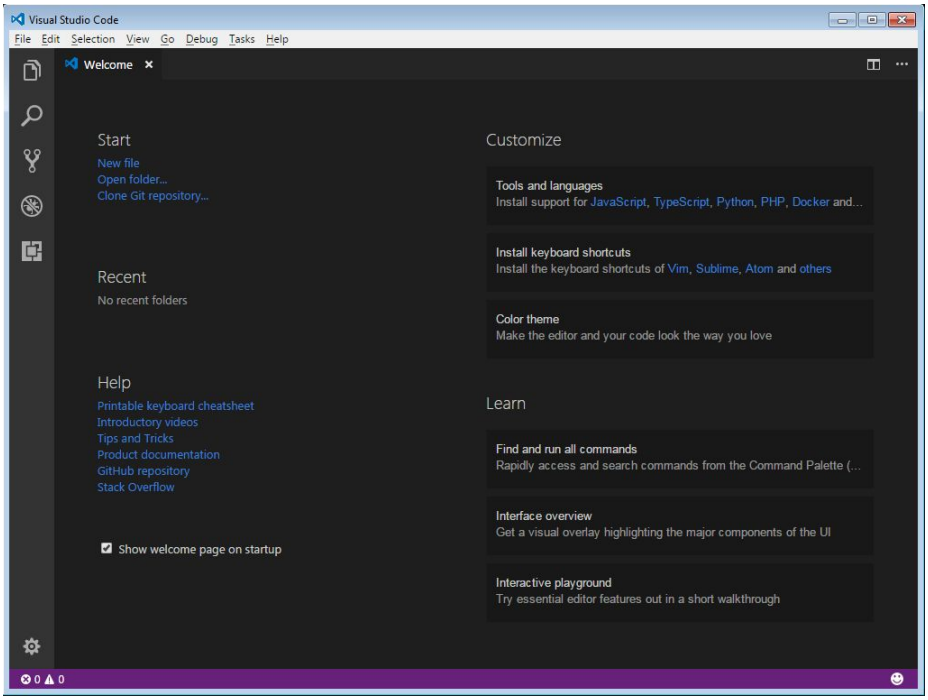
__9. Give it some time to install.



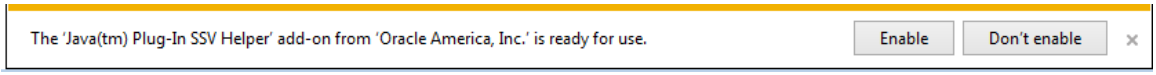
__10. When it is complete, **uncheck Launch Visual Studio Code** and click **Finish**.

__11. Launch Visual Studio Code using the shortcut on the desktop.

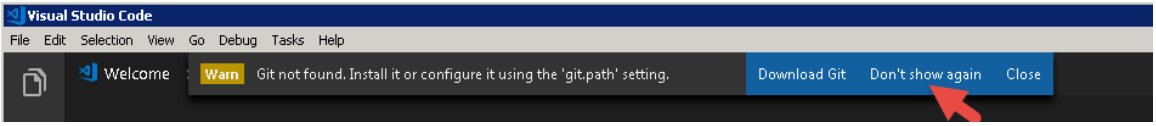
__12. Verify Visual Studio Code opens and that you see the Welcome screen.



__13. You may see a message to enable Java(tm) Plug-In, if so click Enable.



__14. You may see a message regarding Git, if so click **Don't show again**.



__15. Close all windows.

Part 15 - Summary

You have successfully installed the software for this course!

If you have any question please contact us by email at support@webagesolutions.com

From US and Canada call: 1-877-812-8887 ext. 26

International call: 416-406-3994 ext. 26