Setting up Java, Eclipse, and the project starter code

This guide will help you set up the programming environment and starter code that you will need for this course. If you've already got Java (since Sept 2015) and Eclipse set up on your machine, you can skip to Part 2 which tells you how to get and set up the starter code. However, if you run into any mysterious errors you cannot figure out, they could be due to older versions of Java or Eclipse so you'll want to come back and do part 1 to make sure you've got the latest versions.

Part 1: Set up Eclipse (and Java)

In this course we (and you) will be using the Eclipse integrated development environment (IDE) to develop and run our Java code. Eclipse is a powerful, industry-grade IDE. While it might be a little confusing at first because of its power, once you get the hang of it, it will provide for a very pleasant programming experience and you'll wonder how you ever programmed without it! Of course, you are welcome to use any Java development environment you like. You'll be on your own to make sure you have all the libraries and your classpath configured correctly, though I'm sure learners in the forum will be happy to help.

If you already have Eclipse installed do make sure that your Eclipse Version is using JRE1.8.

Step 1: Install the Java JDK, if you don't have it already installed

Unless you have installed Java since September 2015, you must do this step to upgrade your JDK. We are using very new features of Java in this project.

1. Go to http://www.oracle.com/technetwork/java/javase/downloads/index.html

2. Click on one of the buttons to download the latest version of the Java SE JDK (it will be a later version than the screenshot below). These buttons are highlighted in the screenshot below (click either one).

| Overview | Downloads | Documentation | Community | Technologies | Training |

Java SE Downloads

Java Platform (JDK) 8u60

NetBeans with JDK 8

Java Platform, Standard Edition

Java SE 8u60
This releases includes support for ARMv8 processors, Nashorn enhancements, and improvements to Deployment Rule Set functionality.
JDK for ARM releases are now available on the same page as the downloads for other platforms.
Learn more ›

- Installation Instructions
- Release Notes
- Oracle License
- Java SE Products
- Third Party Licenses
- Certified System Configurations
- Readme Files
  - JDK ReadMe
  - JRE ReadMe

JDK
DOWNLOAD ↓

Server JRE
DOWNLOAD ↓

JRE
DOWNLOAD ↓

3. Accept the license agreement in the first list of files titled "Java SE Development Kit …" and then download the file that is right for your operating system.

4. Install the JDK as appropriate for your operating system. If you need instructions, you can find them here:

Windows: http://docs.oracle.com/javase/7/docs/webnotes/install/windows/jdk-installation-windows.html
(https://eventing.coursera.org/api/redirectStrict/JaJDdEjvQJhMNfHGvVpkuxh0bwncsaDeDa
PmIg15SLXZKX6hw6J2T0pTkFtotXCjV7UrfKDLI0gHCU8-
yx5nVA.FzxWtF2bwuVZOfLKDIpwAQ.SvqY0hO3BCwyimJuEfBPN5QB7A2V9HD8FgDHuU3vyff
HlXztnqUfshY1t9A1At2QP9y28hDG_Qpdeu8p_km-ENtw-fnBl44sZ7me-
slycZe5LcK6ozbfF2g6tmdEQjo9tZWbEpcrMz7zRgOlwUfbEgKHkHiMZg6or6t5QuGgfX1qlvJ9R
2f-
Mt324Qowxmjq4WOxOPpMC2fprvsWzMkpN3DQbTVpwCB7GYUfpzXPzk8hGr_lOBILfmHOR
1Gf7h4dr0bUmFbvPTA1_n5qxbbHIkmneWUrXzfvws5mHChd3XDXiSyMISUTULhcD8o-

tPjJlvbNMSsxaqKk8rpalTpyvwvbZ1PK-MfLj6d3DIZlKpi-
M6xSzmIxJ6WLIO9wyk4IJioGXwSNI F3VbFiK2glK2gAvt

MoxSzmixJ6wVUQ9wyk4UJUGXw3NLE3VnFjK2giK2qAvt-
460yxI4HLFiCQGR2YjWwUwClsqZnN7K-9V9c--rxOcOrD1FpXHdNWY-tYN_FHw)

Mac: https://docs.oracle.com/javase/8/docs/technotes/guides/install/mac_jdk.html
(https://eventing.coursera.org/api/redirectStrict/NlZXAf4epWBkdXskVpWLQvtiNQAGMdwO
oFLb0Y6zl53boiB28-
jAKFN54YSsssS9CSZ7qjMuJMzeuY8trkTuNQ.Jxqoy4OJ9u9VfeKEwlmoUQ.C5qoNNFG6azYj5W
2E-Rbi-Zqq6KeDrLPswS54L2qCQpoQMpzd_n8wl-
4ZBiStwqH4kY4pjlDhIeTgVrjkt50TuaKrHUR5LpShYORH8bZ7awDlfI3A5eRzjyP522qGBTwUZ_
NBBE2wudM8Cx6wHhND8ETy8YkZI2us0p_LHlA2QrXUYbnIbREhZaPyiDoI45mT2DVjd2FZ7D
4FbJVy2Vv9O_CIKfqESdZIzTAn-fXjOl-4mqZntuSpYwkFAr4u8tf5RUf1NLAPvwysLSMo-
7JEjT9onIORWftrvc387BN_a1htLentzfdC3lD9-Ol0PMBE2ub5dDh1NyhEX5H4Z5ejH-
L2SPmf57ijeIcQ7DyeZHt0uxbqZF-dLbWXTn0E5qtzt8loGWcHVEQLaO12c1ZVVpYa3dKGJqX-
xjP0bsfqQs)

Linux: https://docs.oracle.com/javase/8/docs/technotes/guides/install/linux_jdk.html
(https://eventing.coursera.org/api/redirectStrict/lA5R6wmRZNciQjXorco9R8B_F1iA8ME14RC
m0KyRrBha-
UzdaL9JtZgBe4Y6laEIaK8k7wFu20WNXwr_pcONkg.SJfGnnijMTMOW1jNlkQrPw.eMivXSAOq4
tharPJVBX7YJWPhM8tn45Fhm97OMzXK9cgtdkD42Pmslmb4frzts6HuwbYMceHYDMRKvQ6tV
CGmSo3oHDSQ0fusFZJwYT7fstetjqxesOW9F57reivQdYh_A7cWx41GW4U-
b5kX8K8SO1y1FwxSeafuAftyYbLfBOUOGvVkqlzxkRijz3GPa1HAHQYGvBesvt6Xdj2YPHSY-
A6IUQklJowejOoEid8_Eyl_qLizDia3L_hMm8fIrX4jG2tXIr0-
qEkamt197d7U4y3MeWnVMACa69BKzhsPsO6KTN_LcxH76kYhHhLWuVnF4SrQctfTETroSB0
8f60pOmwsU3_A7wlQd7jJeAgBq5WfPZxYgQCnK3UEsOZ7UhED3GQNkGDQvUldhECHqOyvq
ZON1P7Xo8VK81Lz3Z--d4)

That's it. You've got the Java SDK on your machine.

Step 2: Download, "install" and setup eclipse

Next, you will install and setup eclipse. You might find the following guide helpful:
https://wiki.eclipse.org/Eclipse/Installation#Download_Eclipse
(https://eventing.coursera.org/api/redirectStrict/GjJmAqVkLkmzBQ1aKhxUgu_OuWpxn3sVp
Hmkl6RNXVRQt14zN5zD-CnMJtwiwLd44a6FWmJDhPkCuzAvuWURCg.MLiuffd6PM8Bl-
0dw9BZuw.xP0YCzL_0JFqdnSo5rZb348YEGK8oJyX4FZxZOiUY7rR5a-
8ebuJVNeOqdBCaziBcsVeYf6IuTIijdb91qjDxR9m_NObXdS6u1w9SpSfxFnhl5Z83J834wupFnW
8xmqnH0c3LlgMUvIstwpkW2siT9GEmcS4HVF2fVllA_Nzt2KaRi0EX0swYeE7w-
DenmijnHIKYEHs4cAiaceb_A1vEE7anjx3iFtZe2ZKmXUd9UWYMeIfyIwn2AnVle0XHUOact272r
sPjeYNaENK9l1wKT3qQo9s3lEwFnVEsTZfoOEZrZTqx6JQZV6pwEn3eTGQx6vAfJwKxaLfu8llm
2zh-0gTpftaR20vQcADH0nrM-Um7EydSzdK9wMBZ0XhcgEDyGWTYokaXqbzt8U1Rw70kw)
And/or you can follow our instructions here:

1. Go to https://www.eclipse.org/downloads/
(https://eventing.coursera.org/api/redirectStrict/XDGoDcgIMS4iBa0aDmuXI9nfEomOAuUSC

(https://eventing.coursera.org/api/redirectStrict/YDG0DcqJM34jPa0aDmuxJ9pfEemQAuU3C
p1ohxCtw0NUkNspJHSmfV3WGgtjYUbDbGEhb-
VUou52UFq8YmP3Ew.fPphg6v24P8NYxuqrbYDoA.F5VG0wAlua2b2po57C4JyPTIZ_AWbvNrb
ClRHWY1oUjfMMVef8YXjZQ3a-URtomLE3BMYKDKmoAI9UJrPsMvSxM-
SKqiy2iFKObxtZXX2NlJMHQ6XPznLpWtyeY5xUB22paU73FM3AC6XSzPiqk1RC3SUbiP6irKll5e
xQviMSihGrucronSJqpc0CHxtEGd01svaQWnSV9uMI5cG9WHx2K1Dr6LESuJCMVUxJksK6ECG
WhuajuAv3hCOs1KSs-sEmiwniuNu5r_IlFH9ZxPHhg_Ut64QaXZ6LD7u6yA8ga-
urV8g8ORG3cAYIfRY2dy).

2. Select your operating system from the dropdown menu in the upper right. Then, in the
row titled Eclipse IDE for Java Developers, click on 32 or 64-bit as appropriate to go to the
download page. Make sure that the version installed is Eclipse Mars or later.

3. Click the Download button to start your download. Save the compressed (.zip or .tar.gz)
file wherever you want on your computer.

4. Uncompress the downloaded file to any location on your computer. Note: Eclipse will
run from here. There is nothing else you need to do to "install" it. However, Windows users
should note the following warning from
https://wiki.eclipse.org/Eclipse/Installation#Download_Eclipse
(https://eventing.coursera.org/api/redirectStrict/GjJmAqVkLkmzBQ1aKhxUgu_OuWpxn3sVp
Hmkl6RNXVRQt14zN5zD-CnMJtwiwLd44a6FWmJDhPkCuzAvuWURCg.MLiuffd6PM8Bl-
0dw9BZuw.xP0YCzL_0JFqdnSo5rZb348YEGK8oJyX4FZxZOiUY7rR5a-
8ebuJVNeOqdBCaziBcsVeYf6IuTIijdb91qjDxR9m_NObXdS6u1w9SpSfxFnhl5Z83J834wupFnW
8xmqnH0c3LlgMUvIstwpkW2siT9GEmcS4HVF2fVIIA_Nzt2KaRi0EX0swYeE7w-
DenmijnHIKYEHs4cAiaceb_A1vEE7anjx3iFtZe2ZKmXUd9UWYMeIfyIwn2AnVle0XHUOact272r
sPjeYNaENK9l1wKT3qQo9s3lEwFnVEsTZfoOEZrZTqx6JQZV6pwEn3eTGQx6vAfJwKxaLfu8llm
2zh-0gTpftaR20vQcADH0nrM-Um7EydSzdK9wMBZ0XhcgEDyGWTYokaXqbzt8U1Rw70kw)

"Note that there is a known problem with the built-in decompression utility on all current
versions of Windows. We recommend that you use a more robust decompression utility

versions of Windows. We recommend that you use a more robust decompression utility such as the open source 7zip when decompressing an Eclipse download. Some people report success when initially decompressing Eclipse into a root directory (e.g. c:\) and then moving it to a more appropriate home (e.g. c:\Program Files\Eclipse)"

5. Once Eclipse is unzipped, run it by either double-clicking on eclipse.exe (Windows and Mac) or typing eclipse at the command line (Linux--make sure it is on your path).

6. Eclipse will ask you to select your workspace. This is where eclipse will store all of your code and project files. We recommend you choose a directory that gets backed up regularly (e.g. on Google Drive, for example). Optionally, make this the default workspace (so Eclipse will not ask you every time).
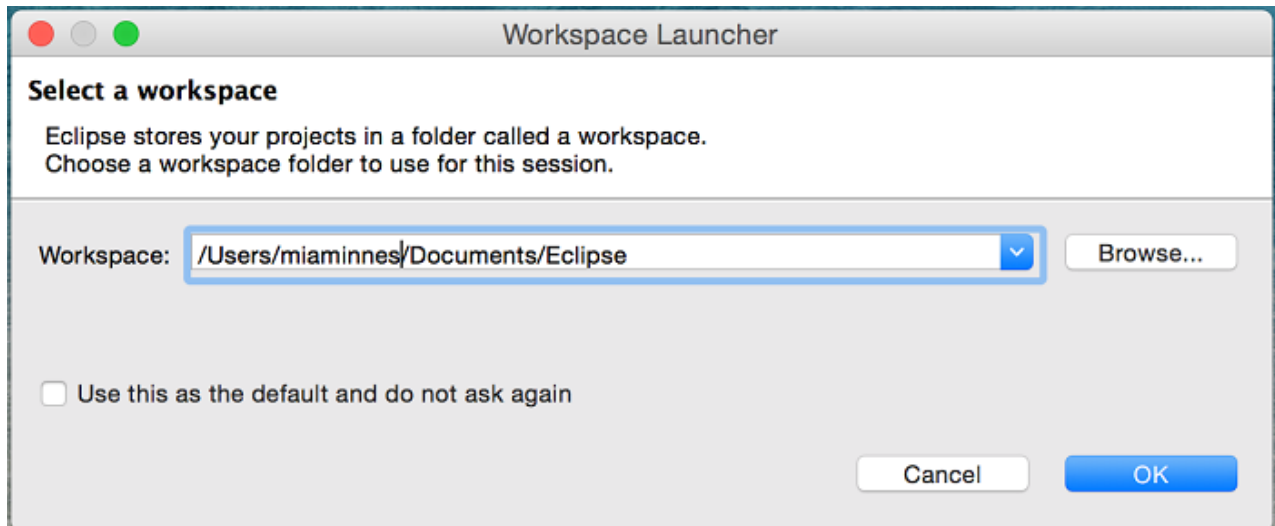
7. Then you will see a welcome screen that has links to a bunch of information including tutorials and overviews. We encourage you to try out some of these, but if you just want to dive in and get started, click the Workbench icon in the top right corner.

8. **(Required for Mac Users.** Otherwise Optional.) Finally, set Eclipse to use the JDK you installed in step 1. Go to Window->Preferences:
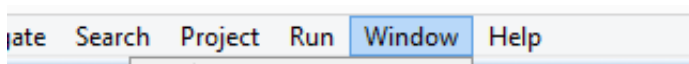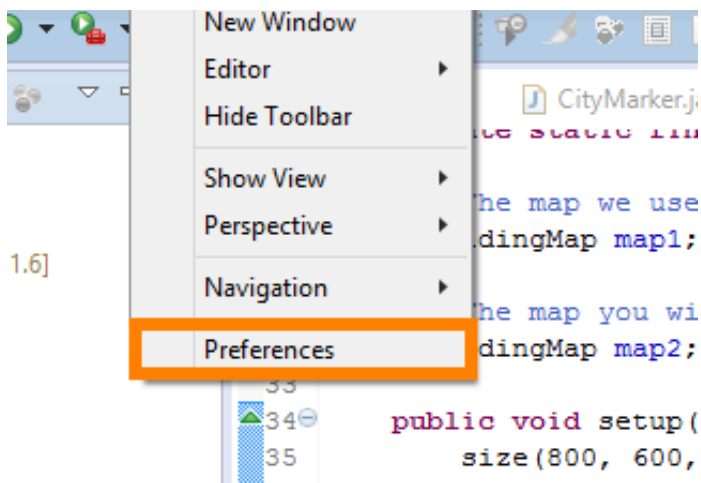
Then, in the window that opens select Java->Installed JREs in the menu on the left, then click Search:
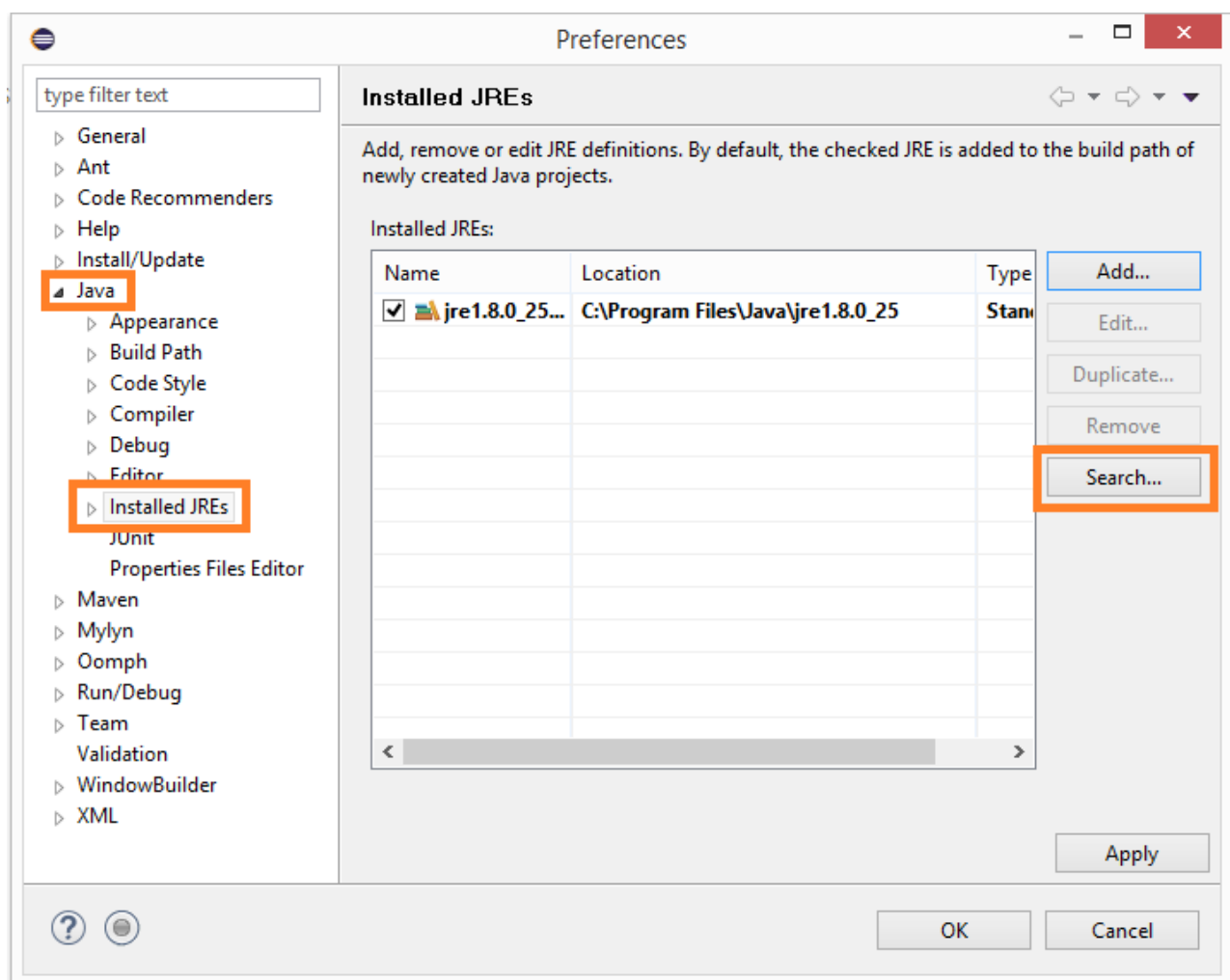
Navigate to where you installed the JDK in step 1. Make sure you select the JDK directory and not the newly installed JRE directory! Then click OK.

Select a directory to search in:

```
▲ 📁 Java
  ▲ 📁 jdk1.8.0_60
      📁 bin
    ▷ 📁 db
    ▷ 📁 include
    ▷ 📁 jre
    ▷ 📁 lib
  ▷ 📁 jre1.8.0_25
  ▷ 📁 jre1.8.0_60
```

Folder: jdk1.8.0_60

Make New Folder   OK   Cancel
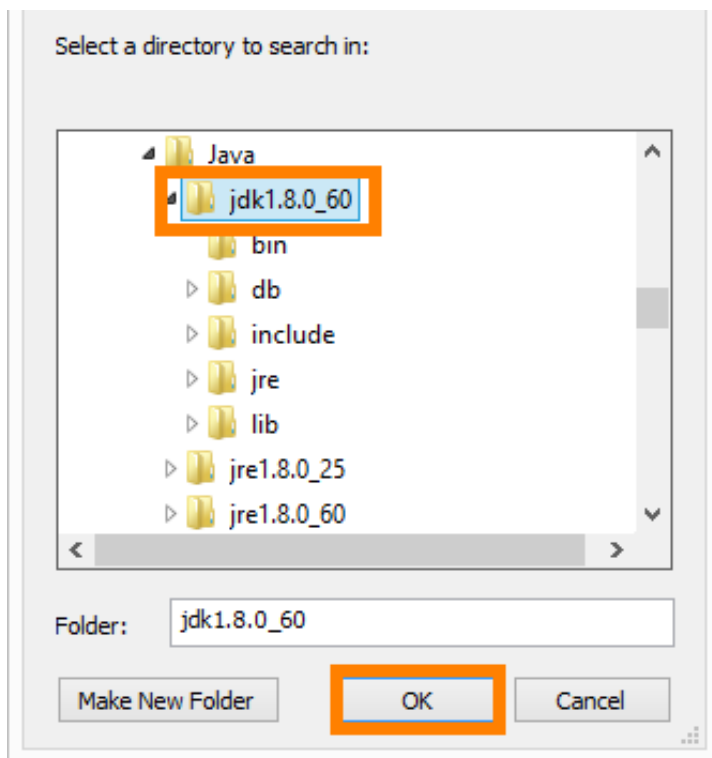
After a moment, eclipse should list a second JRE in the Java->Installed JREs window. Select the JRE in the newly installed JDK folder, and click OK:

Preferences

type filter text

- ▷ General
- ▷ Ant
- ▷ Code Recommenders
- ▷ Help
- ▷ Install/Update
- ▲ Java
  - ▷ Appearance
  - ▷ Build Path
  - ▷ Code Style
  - ▷ Compiler
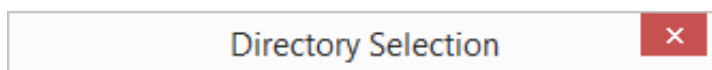 - ▷ Debug
  - ▷ Editor
  - ▷ Installed JREs
  -    JUnit
  -    Properties Files Editor
- ▷ Maven
- ▷ Mylyn
- ▷ Oomph
- ▷ Run/Debug
- ▷ Team
-    Validation
- ▷ WindowBuilder
- ▷ XML

Installed JREs

Add, remove or edit JRE definitions. By default, the checked JRE is added to the build path of newly created Java projects.

Installed JREs:

Name	Location	Type
☑ 📚 jre (default)	C:\Program Files\Java\jdk1.8.0_60\jre	Stan
☐ 📚 jre1.8.0_25	C:\Program Files\Java\jre1.8.0_25	Stan

Add...

Edit...

Duplicate...

Remove

Search...

Apply

OK   Cancel

9. Troubleshooting: If you get strange compile errors at any time during this course, check to ensure that both your compiler and your run time Java versions are set to at least 1.8 or

Step 3: Install e(fx)clipse

In this course the GUI you will be using is written using the Java FX libraries, and to use these libraries in Eclipse you must install the e(fx)clipse extension for Eclipse.

1. Go to www.eclipse.org/efxclipse/install.html
(https://eventing.coursera.org/api/redirectStrict/fmvDq2DE3EYlPPkEjBL0uLgiyKqSnYMMZ4L
HkYm-faHiBDTPd76_QXQ_dQg5BBVYEeQk3RCDTa3OTobcqbf4OQ.jYcpUIX5Uzugp2zZZcc-
mw.t7Hd_5HhJWIXTxJIqyzJ0ImKj27x9g5e1ubjAb5YHP2v3ic7exZU0RXlYooHZqG4RETuS-
yVQeO0NnryN64XB13Htaox_laYaI6L9tijS-
NUzit9AUdXev_7G17HLbYahxc6tNnkwrAlQqcLoeBPRzOminGZMpVHr75DkgdUjpxwTMxBgA
kujgVmb2XeKY8B9lrPkFL3tfcaY1F0s-
rcxqtiKO1gk5zobu3bagnDrjwVzJPiIxk0GR7bbJMG14mtq-tPA083V_cfv3ccKY5R6-
Jux7VaDPylaaJdfC_0uml7285xvMWNVmCLEH59D8f80sRBeQnPR0i0VelAYOorTQ)

2. Next to "For the Ambitious" click on "View details" as highlighted in the screenshot below:
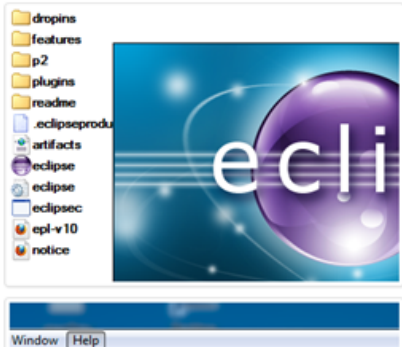

3. Follow the instructions on that page, starting at step 2 or 3, as appropriate (you've already done step 1, and probably have already done step 2 also:

Build Type	Build Name
Latest Release	4.3
4.4 Integration Build	I20130724-16
4.3 Maintenance Build	M20130724-0
4.4 Nightly Build	N20130723-2

Latest Release

2.

- dropins
- features
- p2
- plugins
- readme
- .eclipseprodu
- artifacts
- eclipse
- eclipse
- eclipsec
- epl-v10
- notice

Fire up your Eclipse IDE if you have not done so already.

e(fx)clipse is an extension for your Eclipse IDE which is delivered as a so called p2 repository. Extensions like this can be installed using the "Install New Software" wizard.

3.

Window [Help]

Note, for step 4, after you select "Install New Software", you will want to click the "Add..." button in the upper right to add the repository.

That's it! You're ready to start working with the project code.

Part 2: Download and set up the starter code

How to make sure you always have the latest version of the starter code

Here you will download all of the code needed for the whole course. This course is a programming-heavy course with complex starter and grading code. It launched on December 21, 2015 and although we have tried our hardest to find and fix any errors, unfortunately errors may still exist in the code we are providing to you. We will fix these errors as fast as possible and post the corrected code, but we will need a way to get you the updated code. Here's how that will work:

Each time we find a *significant* problem with the starter code we will (1) send an email to all active learners in this course and (2) upload a new zip file and annotate it with the date it was most recently published and (3) update the attached change log file (which will be attached to this page when things start changing). If we find only minor errors we'll skip step (1).

At the beginning of every programming assignment you should make sure nothing has changed since you downloaded the starter code. You should come back to this page to see if you have the most recent version of the zip file. If you do not, you should:

Download the updated zip file.

Look at the change log to see if it's easiest to grab specific updated file(s) from the zip file you just downloaded and copy it into your workspace directory, replacing the old version of the file. If so, do that.

Otherwise, if you are not sure what file has changed, or want to be extra careful to get all the updates: Copy any files you have created or modified out of your workspace directory. Then delete your existing project (make sure you've made copies of the files you've changed first and put them somewhere totally different on your file system!), and follow the instructions below for setting up the project from the new zip file you downloaded. Finally, copy the files you had modified back into the appropriate locations, overwriting the starter code files. It should not be the case that we need to modify any of the files you would have changed, but if we do then we will include specific instructions in the email we send you about the changed starter code.

How to download and set up the starter code

1. Download the starter code for this course here:

Course3StarterCode.zip (https://d3c33hcgiwev3.cloud...

This starter code was most recently updated December 18, 2015 2:02pm Pacific Standard Time

2. Extract the zip file somewhere outside of your Eclipse workspace folder.

3. Open Eclipse if it is not already open.

4. From the File menu in Eclipse select Import...

| File | Edit | Source | Re |

New   Alt+Shift+N ▸
Open File...
Close   Ctrl+W
Close All   Ctrl+Shift+W
Save   Ctrl+S
Save As...
Save All   Ctrl+Shift+S
Revert
Move...
Rename...   F2
Refresh   F5
Convert Line Delimiters To   ▸
Print...   Ctrl+P
Switch Workspace   ▸
Restart
Import...
Export...
Properties   Alt+Enter
Exit

Package Explorer ⊠
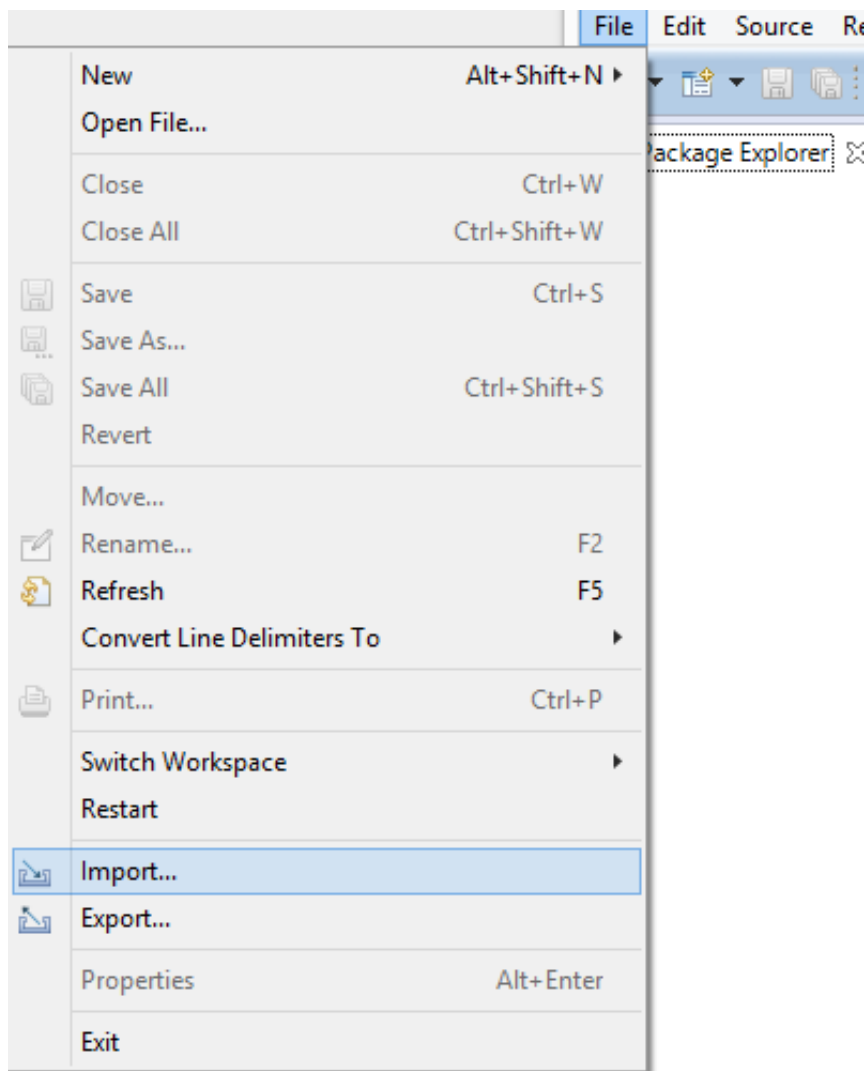
5. In the Import window expand General and select Existing Projects into Workspace. Then click Next >

Import

Select

Create new projects from an archive file or directory.

Select an import source:

type filter text

- ▲ 📂 General
    - 📥 Archive File
    - 📂 Existing Projects into Workspace
    - 📁 File System
    - 📰 Preferences
- ▷ 📂 Git
- ▷ 📂 Install
- ▷ 📂 Maven
- ▷ 📂 Oomph
- ▷ 📂 Run/Debug
- ▷ 📂 Tasks
- ▷ 📂 Team
- ▷ 📂 XML

⑦   < Back   Next >   Finish   Cancel
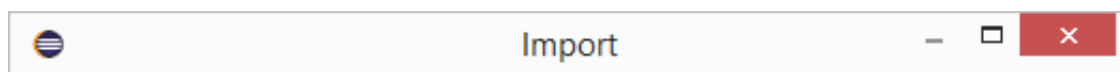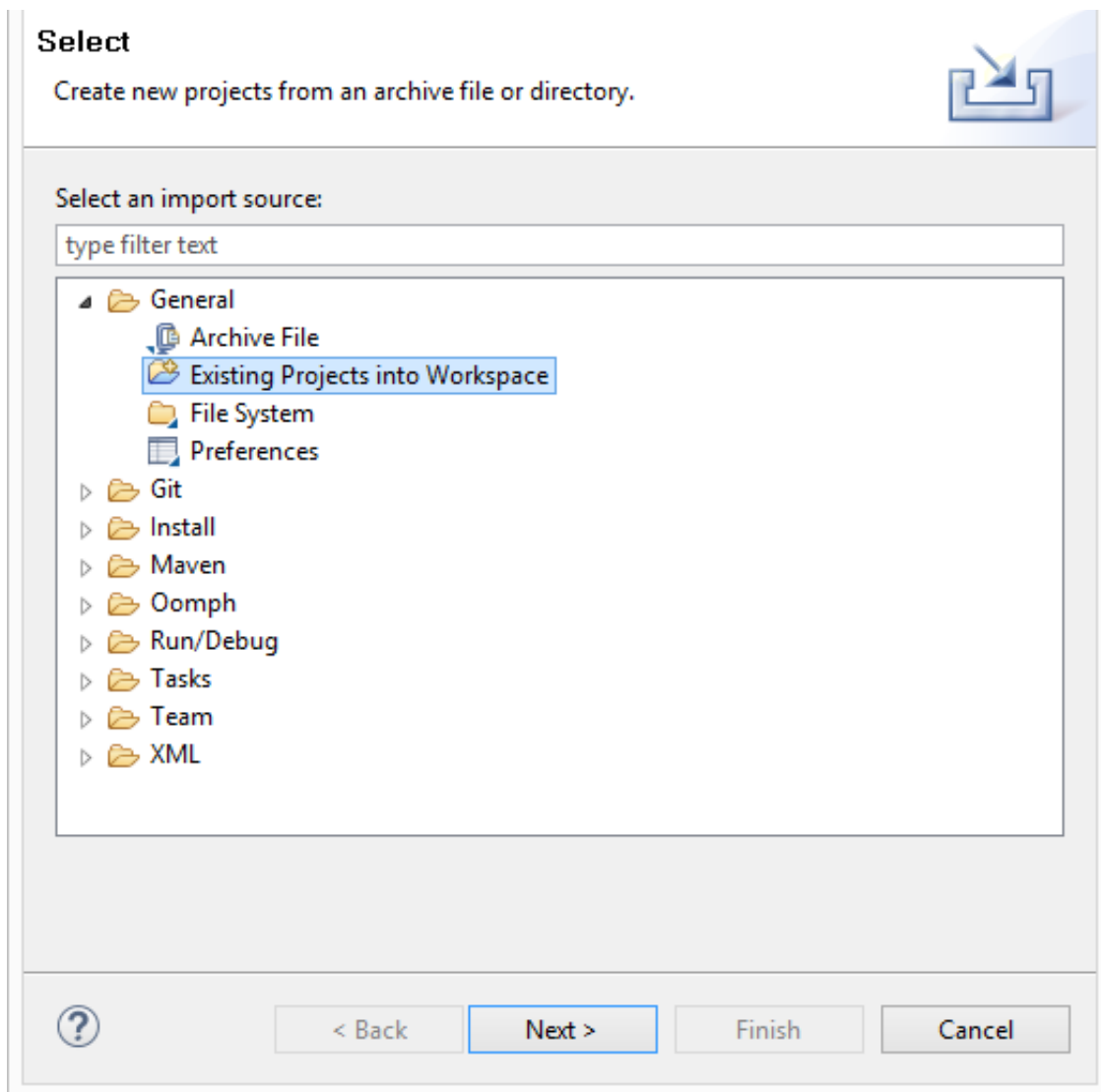
6. In the window that appears, click Browse next to "Select root directory" (keep this option selected).

Import   — ☐ ✕

Import Projects

Select a directory to search for existing Eclipse projects.

⊙ Select root directory: [_____ ▾]   [Browse...]

○ Select archive file: [_____ ▾]   [Browse...]

Projects:

[   ]   [Select All]

                               [Deselect All]

                               [Refresh]

Options

☐ Search for nested projects
☐ Copy projects into workspace
☐ Hide projects that already exist in the workspace

Working sets

☐ Add project to working sets

Working sets: [_____ ▾]   [Select...]

(?)   [< Back]   [Next >]   [Finish]   [Cancel]

7. In the File Chooser, browse to where you uncompressed the starter code. It should be in a folder named UCSDGraphs. Select this folder (NOT one of the subfolders) and click OK.

Browse For Folder   ✕

Select root directory of the projects to import

> Application Data
  bluej
  Contacts
> Cookies
∨ Desktop
  > Course2TextEditor
  > HP
  > MOOCTextEditor
  ∨ UCSDGraphs
      .settings
    > data
    > src

Folder: UCSDGraphs

Make New Folder   OK   Cancel
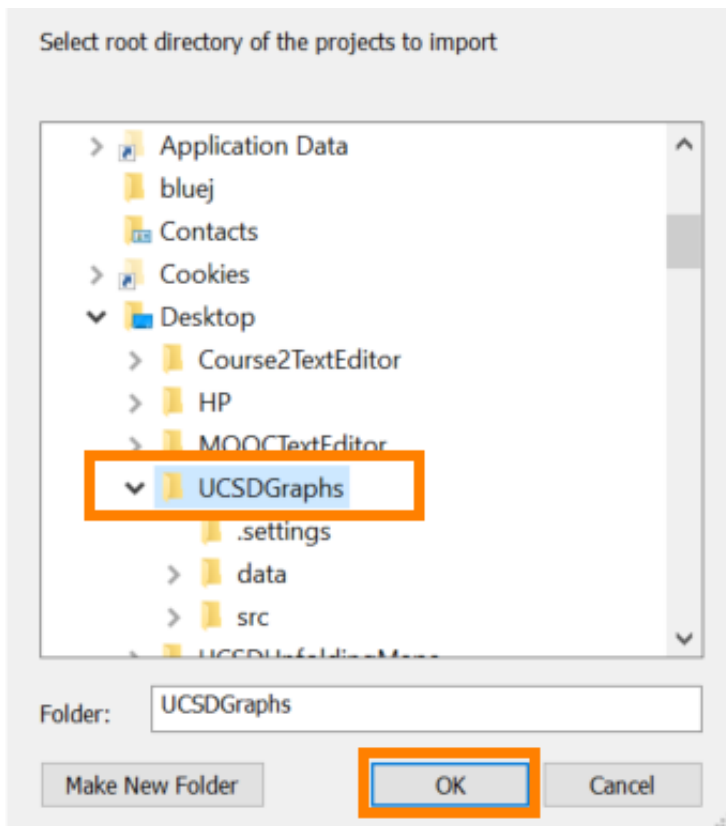
8. You should see the UCSDGraphs project selected under Projects: Make sure the option to "Copy projects into workspace" is checked, then click Finish.

Import

Import Projects

Select a directory to search for existing Eclipse projects.

◉ Select root directory: C:\Users\Christine\Desktop\UCSDGraphs   ⌄   Browse...

◯ Select archive file: ⌄   Browse...

Projects:

☑ UCSDGraphs (C:\Users\Christine\Desktop\UCSDGraphs)   Select All

Deselect All

Refresh

Options

☐ Search for nested projects

☑ Copy projects into workspace

☐ Hide projects that already exist in the workspace

Working sets

☐ Add project to working sets

Working sets: ⌄   Select...

⑦   < Back   Next >   **Finish**   Cancel

9. Now, you should see the project in your Eclipse workspace. In the Package Explorer you will see the UCSDGraphs project. If you expand this project you will see several folders including src, data and some library folders. src is where all of your source (Java) code that we provide and that you will write is located. If you expand src you will see a number of "packages," which we will explain as you go through the programming assignments in the different modules. A package is just a collection of files that are organized into their own space so they won't interfere with other files of the same name in other packages. The instructions for the programming assignment in this module give you more information about how to compile and run your code.

It's expected to see some warnings (the tiny yellow exclamation points next to the items in the Package Explorer) and generally you can ignore them for now, though sometimes they do give you hints about how to improve your code. You can see what they are in the window at the bottom. However you should not see any errors (which would be displayed in red).

10. (Optional: If you plan to test with JUnit--not explicitly covered in this course) Add JUnit to your project. To do this, go to Project >Properties. Select "Java Build Path". Select the

your project. To do this, go to Project->Properties. Select "Java Build Path". Select the "Libraries" tab and "Add Library". Select JUnit, then JUnit 4.

11. Set up the workspace JRE. Right click on the UCSDGraphs project folder in the Package Explorer and select Build Path->Configure Build Path. Go on the Libraries tab and click on "Add Library". Select the "JRE System Library" and click Next. Select "Workspace default JRE" and click Finish. Then click OK.

12. Finally, notice that when you imported this project into Eclipse you got a COPY of all of the starter code files you downloaded into your workspace. You will find the actual files Eclipse is using (including the source (src) and data files) in a directory in your workspace folder called UCSDGraphs. Go find these files so you know where they are and what Eclipse is doing behind the scenes.

That's it! You're all set up and ready to go.