COMP3111: Software Engineering

Java FX

Learning Outcomes:

- Able to create a simple JavaFX UI using Scene Builder.
- Able to program on a simple GUI program using JavaFX.

Supervised Lab Exercises

Environment: Eclipse (Version: Photon RC3 (4.8.0RC3)) with Java Development Kit (JDK 8 64-bits) installed on a Windows 10. The steps may be slightly difference if you are using other versions of Eclipse or Mac

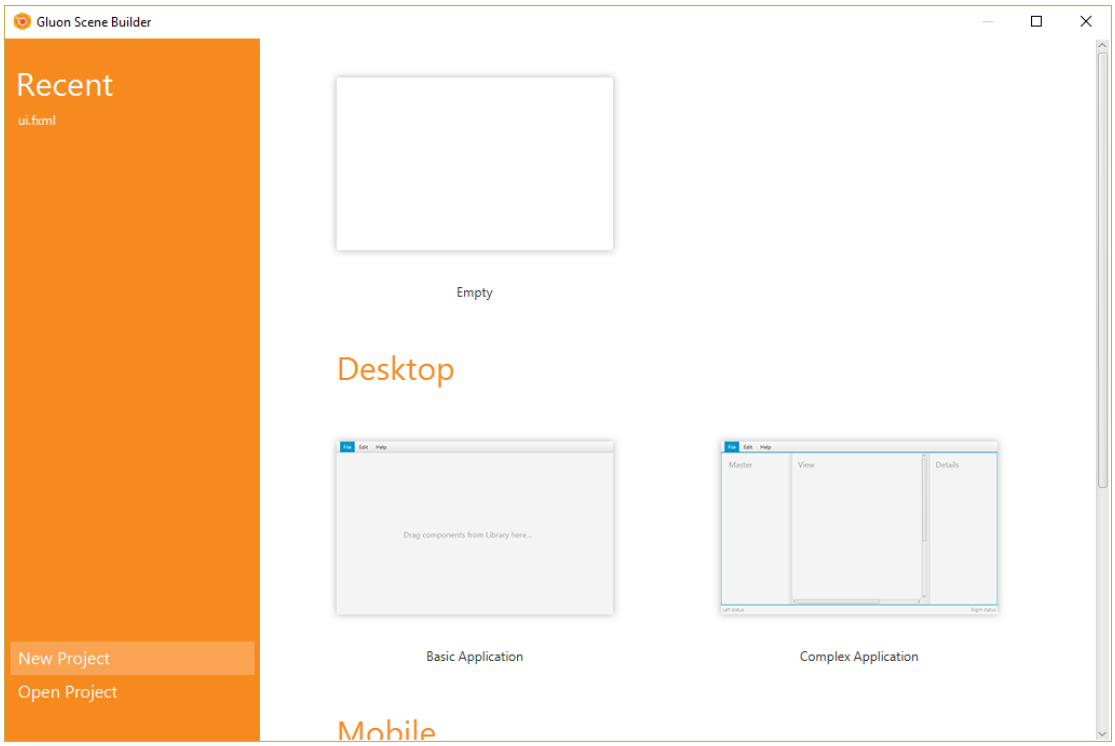
Note: JavaFX is a technology that helps you create a GUI environment. JavaFX is included in most of the JDK as a standard development package. There are other Java GUI technologies like Swing / AWT. In our project, we select JavaFX.

In JavaFX, the UI design is saved in a XML file with the file extension ".fxml". This file will be loaded to the program in run-time. In this lab we will let you create the fxml file and do some programming on Java to create a very simple Java GUI program.

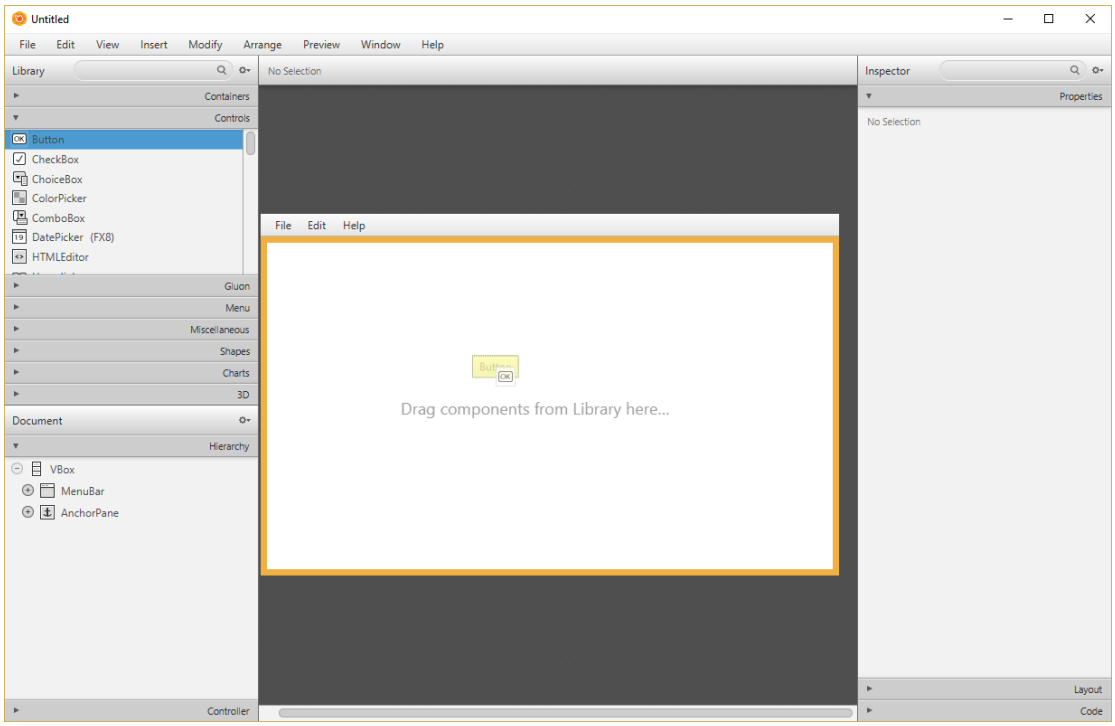
Exercise 1: Create a JavaFX UI using Scene Builder

Step 1.1 Download Scene Builder for Java 8. https://gluonhq.com/products/scene-builder/

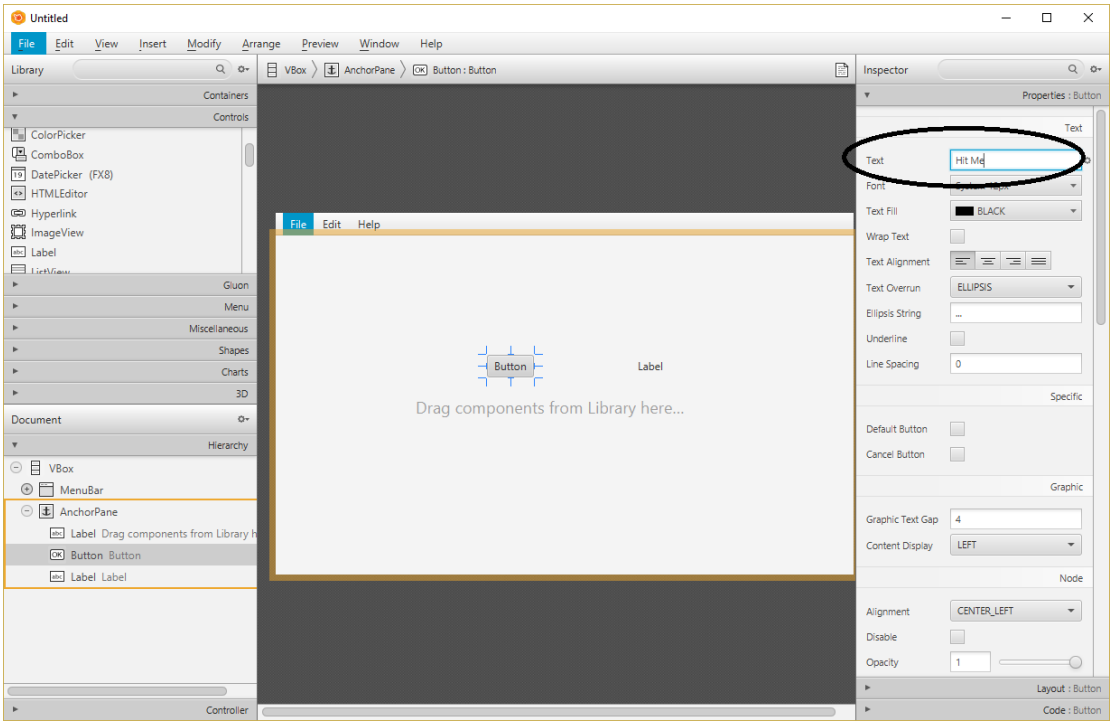
Step 1.2. Launch Scene Builder and select "Basic Application"



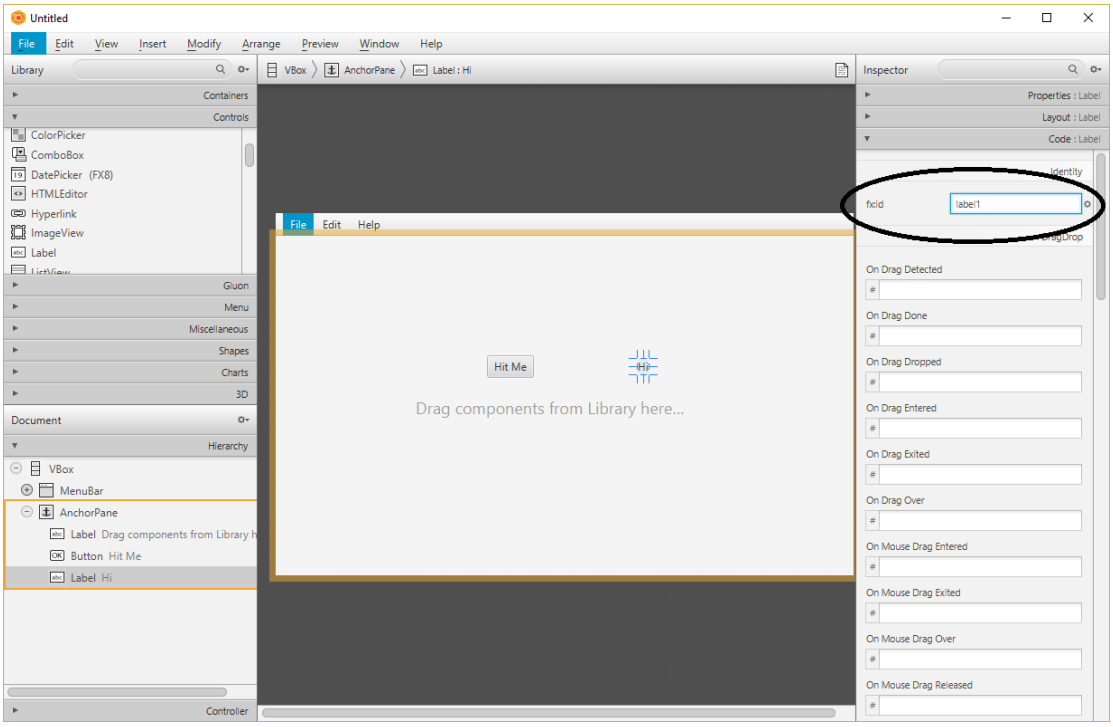
Step 1.3. Drag a “Button” control to it. Then drag a “Label” control too.



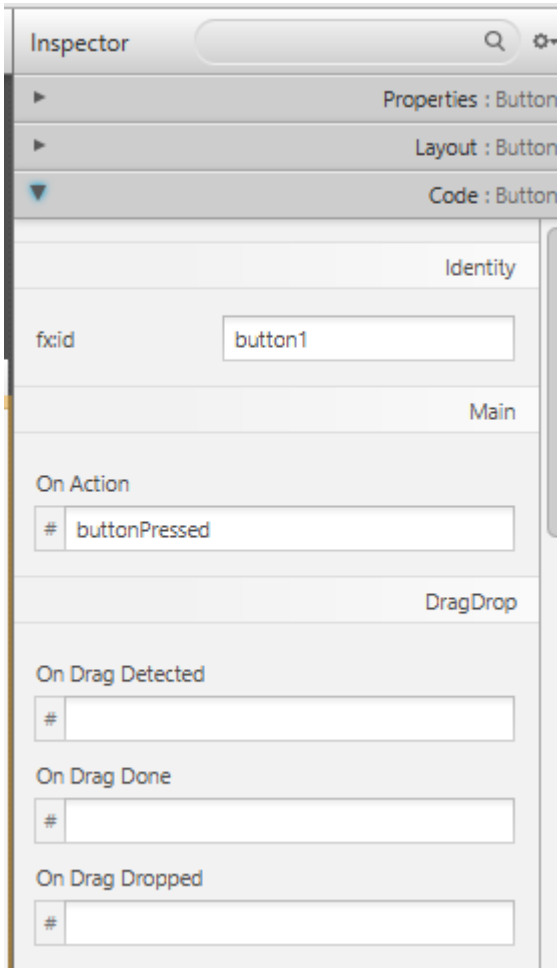
Step 1.4. From the “Inspector” panel you can change the attribute of the controls. Set the text on the button to “hit me” and label to “Hi”.



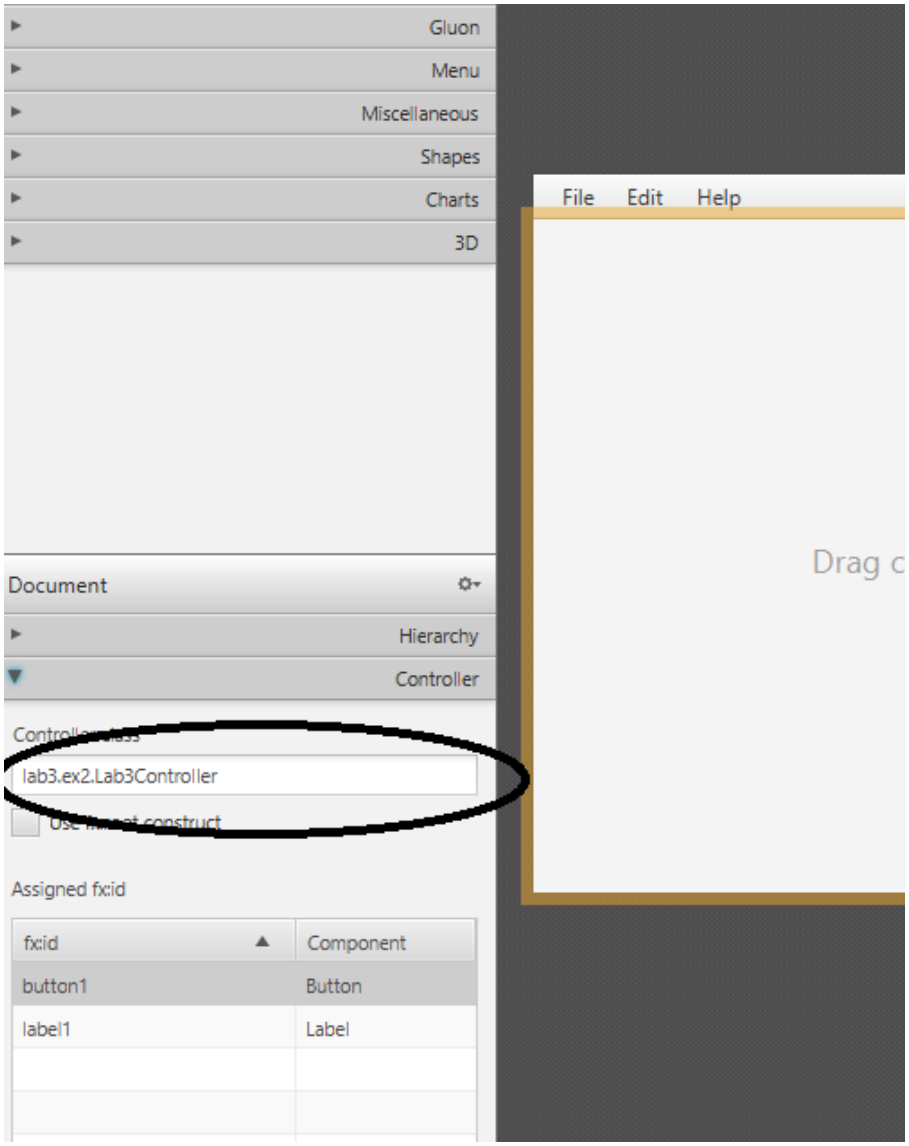
Step 1.5. Under “Inspector” > “Code”, change the identity of the label as “label1”
Note: we will refer the label using the variable name “label1” in our code.



Step 1.6. For the button, we change the identity of it as “button1” and also add an event “buttonPressed” under “Main” > “On Action”.
Note: we will refer the button using the variable name “button1” and when the button is clicked, the function “buttonPressed” will be called.

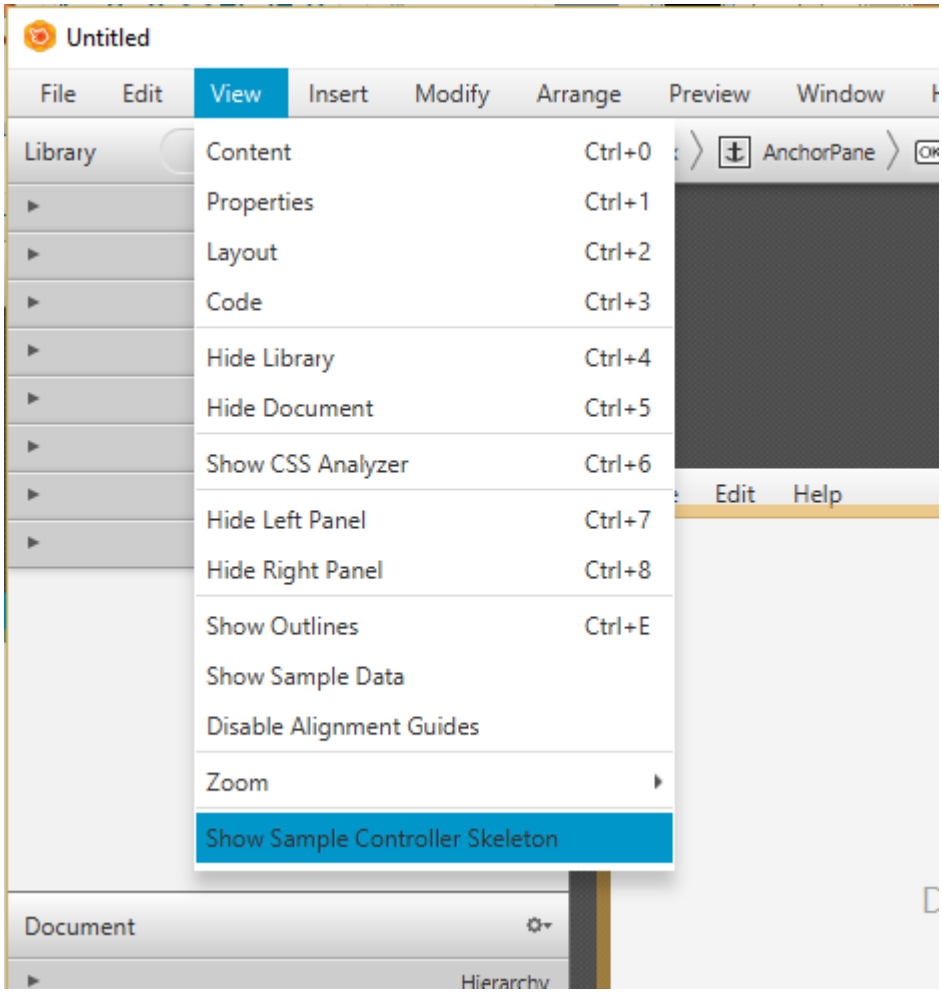


Step 1.7. On the Panel “Document” add “lab3.ex2.Lab3Controller” to the field Controller.



Note: we will use the class "Lab3Controller" to control the UI and to accept input from the user.

Step 1.8 From the menu bar click "View" > "Show Sample Controller Skeleton". Copy the code and we will paste it in our eclipse later.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Show CSS Analyzer Ctrl+6
Hide Left Panel Ctrl+7
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Show Outlines Ctrl+E
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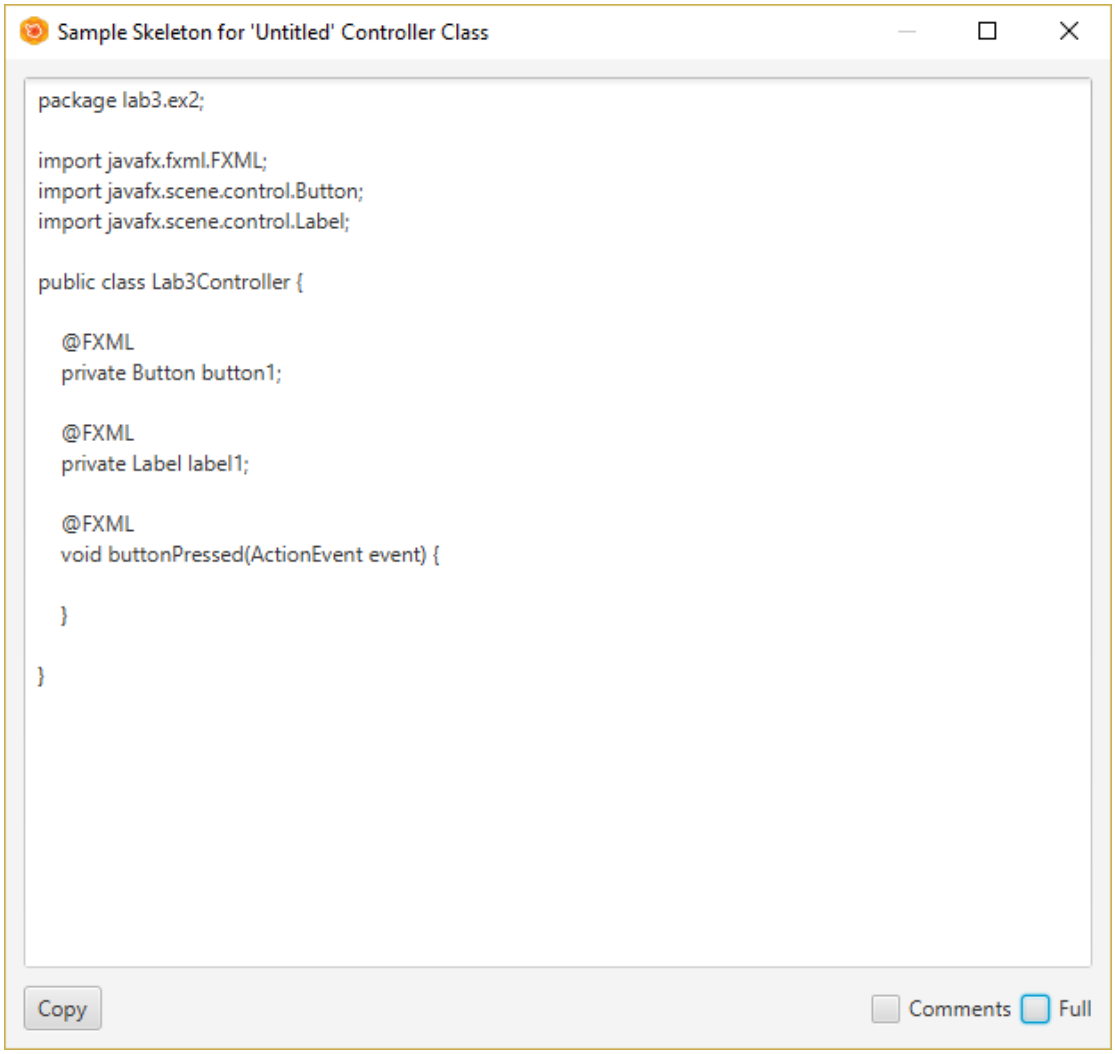
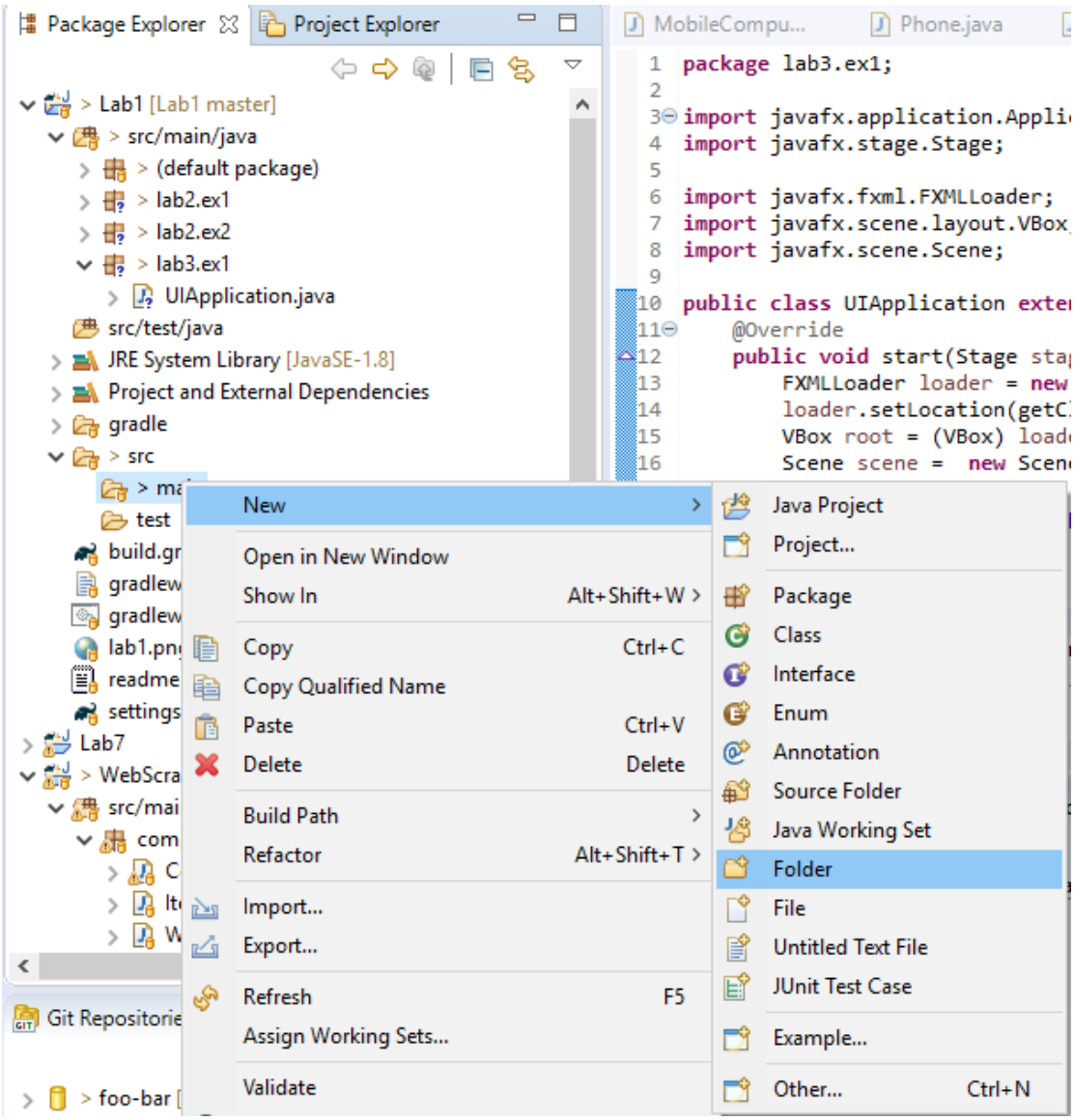
Zoom
Show Sample Controller Skeleton
AnchorPane
Edit
Help
Document
Hierarchy



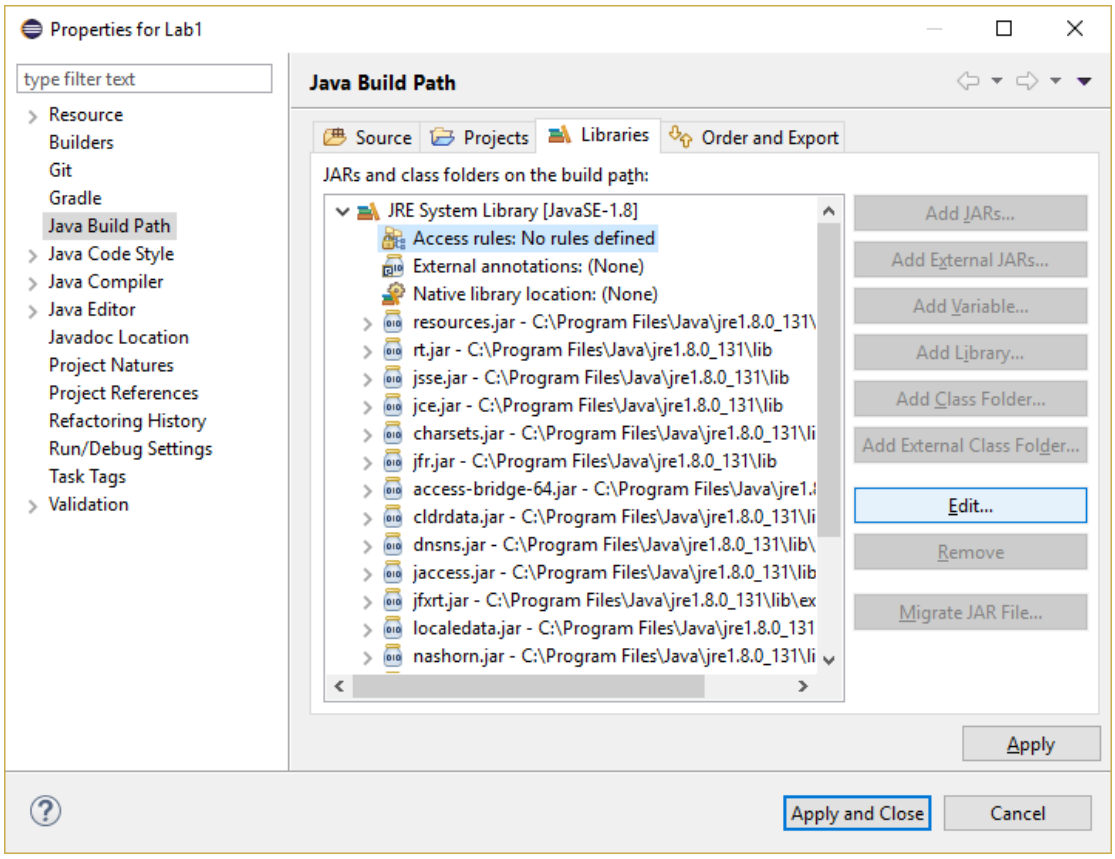
Step 1.9. From the menu bar click File > Save to save your work on your desktop. Name it as “ui.fxml”.

Exercise 2: Create a simple JavaFX program.

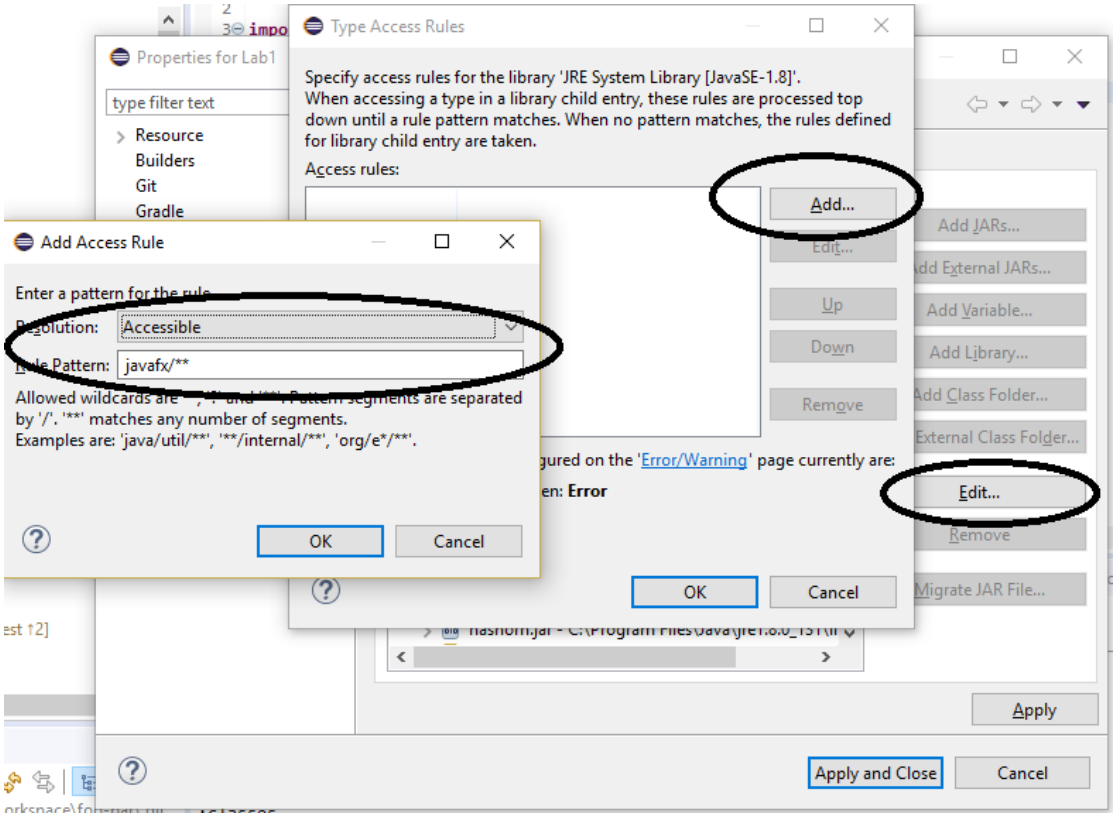
Step 2.1 Continue on your previous lab and create a new folder “resources” under “src/main”. Copy the file “ui.fxml” to this folder.
Note: You cannot change the folder name or the case of the folder name.



Step 2.2. Right Click the project and select “Properties” > “Java Build Path” > “JRE System Libraries” > “Access Rule” and select “Edit”



Step 2.3. Add a new rule with Pattern “javafx/**” and make it accessible. This will suppress all warnings related to permission problem of JavaFX.



*Note: the program will still **compile** if you don't do this step. However your eclipse may prompt you a lot of errors.*

Step 2.4. Add a new class "Lab3Controller" under the package "lab3.ex2". Paste the content that you copy from the Scene Builder. **Add** the line "import javafx.event.ActionEvent;" to the file.

MobileCompu... Phone.java Charger.java

```
1  package lab3.ex2;
2
3  import javafx.event.ActionEvent;
4  import javafx.fxml.FXML;
5  import javafx.scene.control.Button;
6  import javafx.scene.control.Label;
7
8  public class Lab3Controller {
9
10     @FXML
11     private Button button1;
12
13     @FXML
14     private Label label1;
15
16     @FXML
17     void buttonPressed(ActionEvent event) {
18
19     }
20
21 }
```

Step 2.5. Add a new class "UIApplication" under the package "lab3.ex2".

Library.java MobileCompu... Phone.java WebScraperA...

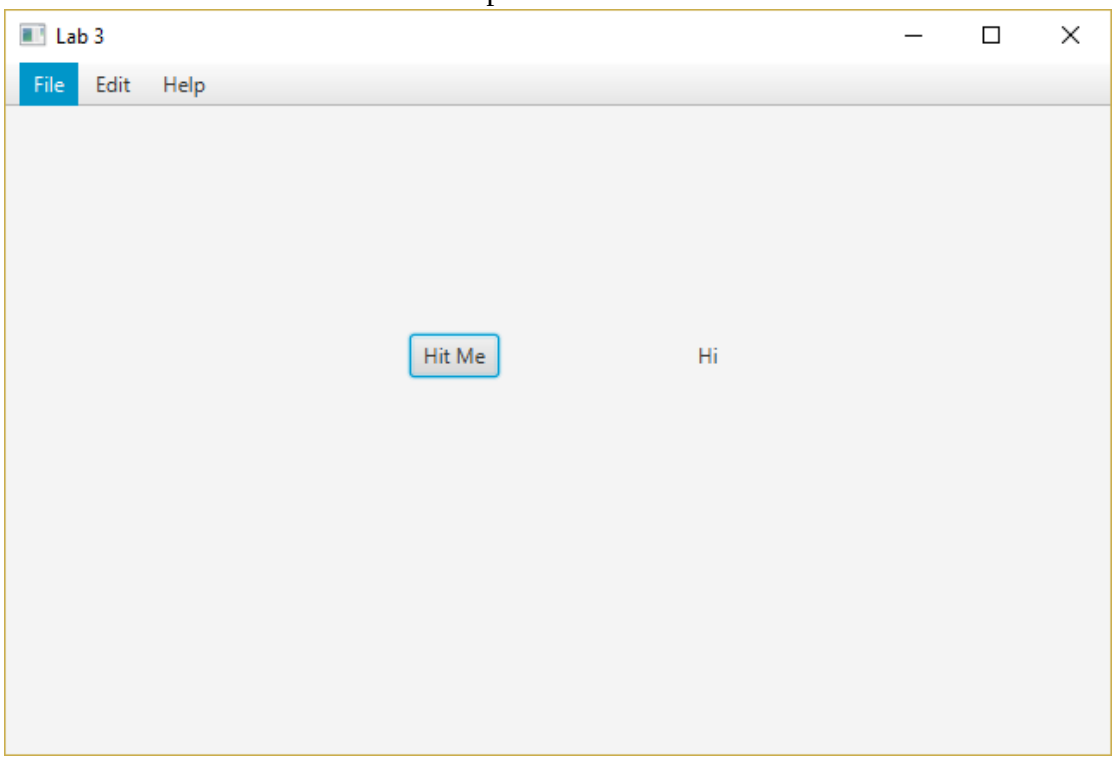
```
1  package lab3.ex2;
2
3  import javafx.application.Application;
9
10 public class UIApplication extends Application {
11     @Override
12     public void start(Stage stage) throws Exception {
13         FXMLLoader loader = new FXMLLoader();
14         loader.setLocation(getClass().getResource("/ui.fxml"));
15         VBox root = (VBox) loader.load();
16         Scene scene =  new Scene(root);
17         stage.setScene(scene);
18         stage.setTitle("Lab 3");
19         stage.show();
20
21     }
22
23     public static void run(String arg[]) {
24         Application.launch(arg);
25     }
26 }
```

Step 2.6. Change the driver Program Library.java to

*Library.java MobileCompu... Phone.java

```
1  public class Library {
2      /* Add this function */
3      public static void main(String arg[]) {
4          lab3.ex2.UIApplication.run(arg);
5
6      }
7  }
8
```

Step 2.7 Try to execute the Gradle task “Run” and you should see a GUI while the button can be clicked but does not response.



Step 2.8. Go to Lab3Controller.java and add “label1.setText(“Welcome to JavaFX”);” to the function “buttonPressed”

```
@FXML
void buttonPressed(ActionEvent event) {
    label1.setText("Welcome to JavaFX");
}
```

When you run the program again, the button will change the text of label1.

Lab Activity and Assessment

Lab Activity

1) Follow the steps in Exercise 1 and 2.
2) Modify the program in the following way: add a TextField control to the GUI so that when the button1 is pressed, the label will display the text typed in the textfield.

Assessment

This is an ungraded lab. Feel free to seek help with the TA.