SE1021 Half Exam 3   Name:

Use only your pen/pencil/eraser (for example, no note-sheet). Review all questions before you get started. The exam is printed double-sided. Show all work. You do not need to comment your code.

1. (10 points) Consider these JavaFX controls added in the order shown to a Panel:

| Long long long long label | Text Area with some user text | Button |

Sketch how these controls would be laid out by a

a. VBox   b. StackPane

2. (10 points) In the JavaFX framework, **describe** how JavaFX determines what code should be executed when a particular button `addButton` is pressed.

3. (10 points) **Describe two** differences between an anonymous inner class and an ordinary inner class.

4. (20 points) Complete the code below to provide an `EventHandler<ActionEvent>` to the `subtractButton`. Use an anonymous inner class. The interface `EventHandler<ActionEvent>` has one method, `public void handle(ActionEvent event)`.

```
subtractButton.setOnAction(
```
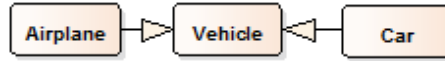
```
);
```

5. (10 points) ***Describe*** two advantages of designing a GUI with FXML instead of pure Java code.

6. (10 points)

For each assignment below, ***write*** whether the code will compile and, if it will compile whether it will run successfully. ***Explain*** anything that either doesn't compile or doesn't run. (Only consider type-casting errors.)

	Compiles	*Runs*	*Explain*

a. Vehicle vehicle = new Car();
   Car car = (Car) vehicle;

b. Airplane airplane= new Vehicle();
   Vehicle vehicle2 = (Vehicle) airplane;

7. (5 points) ***Circle all*** the relationship arrows in which the class pointed to by the arrow must have methods with the same names, arguments, and return values as the class at the other end.

   c.   b.   c.   d.   e.
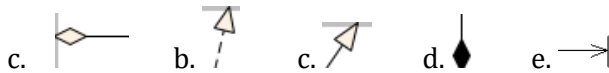
8. (5 points) ***Circle all*** of the types that you can use new on to create a new instance of that type
   d. An ordinary class   f. An interface
   e. An abstract class   g. An inner class

9. (5 points) ***Circle one***. The arrow in this diagram indicates that…

   h. A holds a reference to B   j. B holds a reference to A
   i. A implements B   k. B implements A

10. (5 points) ***Circle one.*** Declaring a variable static means that
   a. The variable cannot be changed
   b. The variable is a reference type
   c. There is only one copy of the variable in the program
   d. The variable cannot be accessed from outside the class

11. (10 points) ***Describe*** the difference between a private and a protected variable.