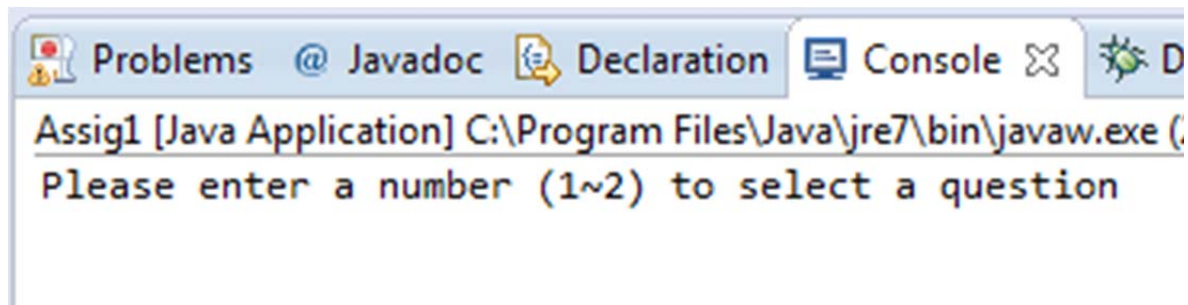


Laboratory Four

Activity 0: Preparation

1. Create a project called “lab4” under Eclipse;
2. Copy “lab4” into project;
3. Copy “questions” into project;

Make sure your program can run correctly. An expected output of the UI is shown below.



The screenshot shows the Eclipse IDE's console window. The title bar includes icons for Problems, Javadoc, Declaration, Console, and a close button. The console text reads: "Assig1 [Java Application] C:\Program Files\Java\jre7\bin\javaw.exe (" followed by "Please enter a number (1~2) to select a question".

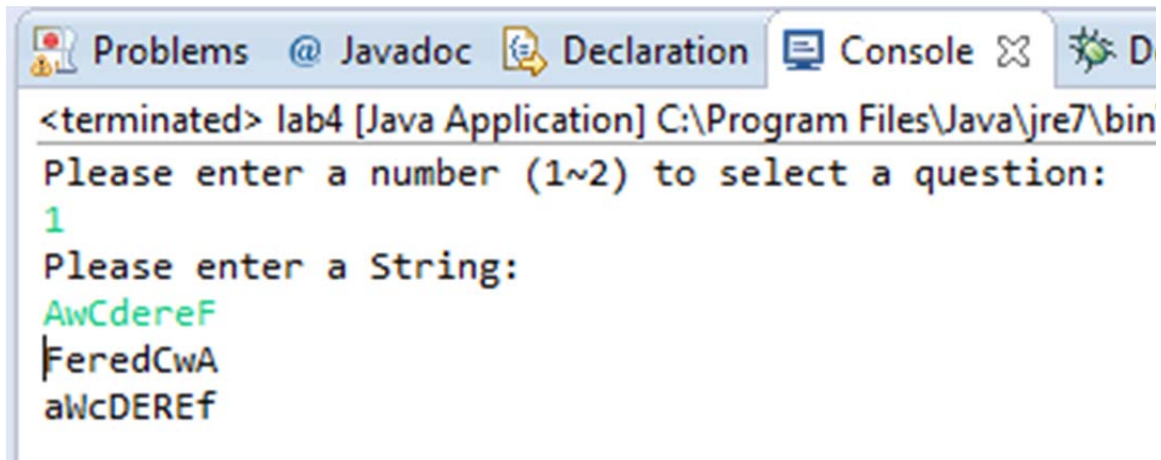
```
Assig1 [Java Application] C:\Program Files\Java\jre7\bin\javaw.exe (  
Please enter a number (1~2) to select a question
```

Activity 1 String arrays and arguments [2 marks]

Please finish the following function in method *q1* defined in *questions* class.

- 1) Accept a string input by user;
- 2) Reverse such string and print it out;
- 3) Interchange of uppercase and lowercase of each char in such string and print it out;

An expected output is shown below:



```
<terminated> lab4 [Java Application] C:\Program Files\Java\jre7\bin
Please enter a number (1~2) to select a question:
1
Please enter a String:
AwCdereF
FeredCwA
aWcDEREF
```

Activity 2 Comparing Students [8 marks]

The *Comparable* interface is a very commonly implemented interface. Any class that implements it must define a method called *compareTo* that compares two objects of that class. If the object that invokes the method is “less than” the object being passed as a parameter, the method returns a negative number. If the object that invokes the method is “greater than” the object being passed as a parameter, the method returns a positive number. If the objects are “equal” the method returns zero. It is up to the programmer to decide what it means for one object to “less than” or “greater than” another object.

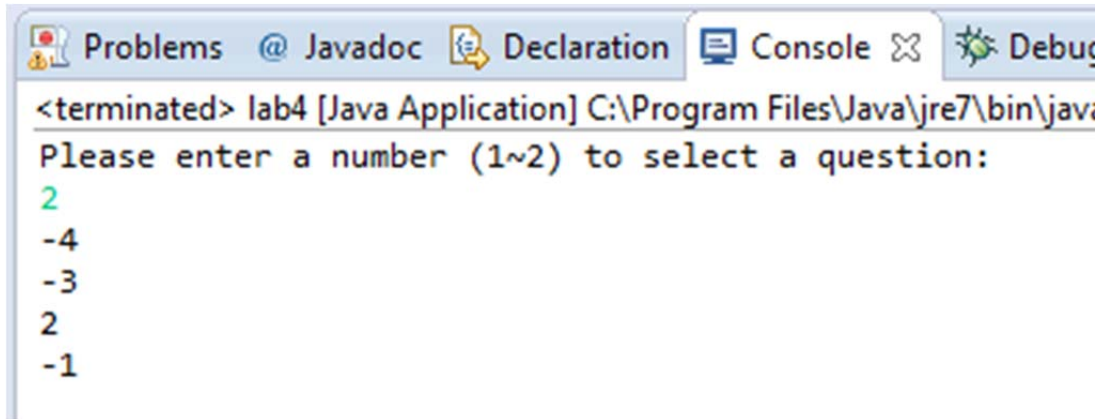
Method *q2* defines several *Student* instances.

```
30 void q2()
31 {
32     Student s1_1 = new Student("Tom", "Oshawa", "Computer Science");
33     Student s1_2 = new Student("Tom", "Oshawa", "Computer Science");
34
35     Student s2_1 = new Student("Jean", "Toronto", "Chemistry");
36     Student s2_2 = new Student("Jean", "Toronto");
37
38     Student s3_1 = new Student("Tom", "Toronto");
39     Student s3_2 = new Student("Tom", "Oshawa");
40
41     Student s4_1 = new Student("Kate", "Whiteby");
42     Student s4_2 = new Student("Tom", "Whiteby");
43
44     System.out.println(s1_1.compareTo(s1_2));
45     System.out.println(s2_1.compareTo(s2_2));
46     System.out.println(s3_1.compareTo(s3_2));
47     System.out.println(s4_1.compareTo(s4_2));
48 }
```

Please edit *Student* class included in lab4 package by implementing *Comparable* interface. As a result, user can make a comparison based on *name*, *address*, *major*, and *GPA*.

1. If the different is in the *name*, +/- 1 is returned.
2. If the different is in the *address*, +/-2 is returned.
3. If the different is in the *major*, +/- 3 is returned.
4. If the different is in the *GPA*, +/-4 is returned.
5. If all elements are same, 0 is returned.

A possible output is shown below:



```
<terminated> lab4 [Java Application] C:\Program Files\Java\jre7\bin\jav
Please enter a number (1~2) to select a question:
2
-4
-3
2
-1
```

What need to be submitted?

1. lab4.java
2. questions.java
3. Student.java

=====End of Lab 4=====