SLIIT UNI
THE KNOWLEDGE UNIVERSITY

Faculty of Computing

Year 1 Semester 1 (2024)

IT1120 – Introduction to Programming Lab Sheet 09

Question 1 (Tutorial 9 – Q1)

The 'Quadratic Equation' is given below.

$$x = \frac{-b \mp \sqrt{b^2 - 4ac}}{2a}$$

Write a Java program to input any three values for a, b, c and to calculate the x value.

Hint: Use ***pow()*** and ***sqrt()*** methods in Java Math class.

Save the file inside **'Lab 9'** folder as: **ITxxxxxxxxLab9Q1.java**

Replace 'ITxx xxx xxx' of the filename, with your own Student ID.

Expected Output:

```
Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Users\junius.a\Desktop\Lab 9>javac ITxxxxxxxxLab9Q1.java

C:\Users\junius.a\Desktop\Lab 9>java ITxxxxxxxxLab9Q1
Enter value a: 2
Enter value b: 5
Enter value c: 3

Roots are real and different :
Root 1: -1.00
Root 2: -1.50
```

Question 2 (Tutorial 9 – Q2)

Write a Java method called circleArea() that take the radius of a circle as an argument/parameter, then calculate area and return the area.

In the Main Method, read the radius value as an user input via keyboard, then call the **circleArea()** method to display the result.

Save the file inside **'Lab 9'** folder as: **ITxxxxxxxxLab9Q2.java**

Replace 'ITxx xxx xxx' of the filename, with your own Student ID.

Expected Output:

```
Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Users\junius.a\Desktop\Lab 9>javac ITxxxxxxxxLab9Q2.java

C:\Users\junius.a\Desktop\Lab 9>java ITxxxxxxxxLab9Q2
Enter the radius of the circle: 5
The area of the circle with radius 5.0 is : 78.53981633974483
```

Question 3 (Tutorial 9 – Q3)

Write three Java methods do the following

- **add()** – add two integers pass as parameters and return the result
- **multiply()** – multiply two integers pass as parameters and return the result
- **square()** – receive an integer as a parameter and return the result after multiplying the number by itself.

Use the above methods in the Main Method to calculate the result of the following mathematical expressions:

i. $(3 * 4 + 5 * 7)^2$

ii. $(4 + 7)^2 + (8 + 3)^2$

Save the file inside **'Lab 9'** folder as: **ITxxxxxxxxLab9Q3.java**

Replace 'ITxx xxx xxx' of the filename, with your own Student ID.

Expected Output:

```
Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Users\junius.a\Desktop\Lab 9>javac ITxxxxxxxxLab9Q3.java

C:\Users\junius.a\Desktop\Lab 9>java ITxxxxxxxxLab9Q3
Result of (3 * 4 + 5 * 7)²      : 2209
Result of (4 + 7)² + (8 + 3)²   : 242
```

Question 4 (Tutorial 9 – Q4)

Write a Java program to calculate the Final Mark and Grade of 5 students for a subject.

a) Write a Java method called **calcFinalMark()** to calculate the final mark of the subject. When calculating the final mark, 30% is taken from the assignment mark and 70% is taken from the exam paper mark.

   Method should return the final mark

b) Write a method called **findGrades()** to return the grade obtained for the given final mark. Grades are calculated as follows:

Final Mark	Grade
mark >= 75	A
60 <= mark < 75	B
50 <= mark <60	C
mark <50	F

c) Write a method called **printDetails()** to print the Name, Final Mark and Grade of a student.

   Your output should be as follows:

Name	Final Mark	Grade
.....	.....	.....
.....	.....	.....
.....	.....	.....

d) In your Main Method, ask the user to enter the **Name, Assignment** Mark (out of 100) and the **Exam Paper Mark** (out of 100) of the 5 students from the keyboard.

   Display the *Name*, *Final Mark* and *Grade* of a student.

   *Hint: Use the methods written in section **b)** and **c)***

Save the file inside **'Lab 9'** folder as: **ITxxxxxxxxLab9Q4.java**

Replace 'ITxx xxx xxx' of the filename, with your own Student ID.

Expected Output:

```
C:\Users\junius.a\Desktop\Lab 9>java ITxxxxxxxLab9Q4

Enter Name of Student 1: AAA
Enter Assignment Mark (out of 100) for AAA: 74
Enter Exam Paper Mark (out of 100) for AAA: 75

Enter Name of Student 2: BBB
Enter Assignment Mark (out of 100) for BBB: 59
Enter Exam Paper Mark (out of 100) for BBB: 60

Enter Name of Student 3: CCC
Enter Assignment Mark (out of 100) for CCC: 49
Enter Exam Paper Mark (out of 100) for CCC: 50

Enter Name of Student 4: DDD
Enter Assignment Mark (out of 100) for DDD: 35
Enter Exam Paper Mark (out of 100) for DDD: 85

Enter Name of Student 5: EEE
Enter Assignment Mark (out of 100) for EEE: 25
Enter Exam Paper Mark (out of 100) for EEE: 30

Name            Final Mark      Grade
AAA             74.70           B
BBB             59.70           C
CCC             49.70           F
DDD             70.00           B
EEE             28.50           F
```