

LAB 9 – Methods

Objectives:

At the end of this lab, the students are able to:

- i. apply pre-defined methods with or without parameters.
- ii. implement calling method to invoke the pre-defined methods.
- iii. write user-defined method with and without parameters.
- iv. use values from value-returning of pre-defined and user-defined methods.

9.1 Activity 1

8.1.1 Objective

Writing a Java program by using pre-defined methods.

8.1.2 Problem Description

Write a Java program that should be able to display the output as shown in the table below by manipulating pre-defined methods in class Math. The value of sales either can be obtained from user or pre-initialized. From these values, the program also should be able to identify and display the maximum value, as well as display the list of array.

SALES	CEIL	FLOOR	SQUARE ROOT	RADIAN
20000.30	20001.00	20000.00	141.42	349.07
15008.90	15009.00	15008.00	122.51	261.95
12584.10	12585.00	12584.00	112.18	219.63
87543.00	87544.00	87543.00	295.88	1527.91
28791.30	28912.00	28911.00	169.68	502.50

[Estimated Time:30 minutes]

9.2 Activity 2

8.2.1 Objective

Writing Java program by implementing user-defined method without parameter and with no returning value.

8.2.2 Problem Description

Modify pseudocode in Module 2 (Activity 6) and write a method called `calculate_kilometre()` that should be able to display speeds from 60 miles per hour through 130 miles per hour, in increments of 10 along with their values converted to kilometres per hour.

$$\text{Kilometer Per Hour} = \frac{\text{Miles Per Hour}}{0.6214}$$

[Estimated Time: 30 Minutes]

9.3 Activity 3

8.3.1 Objective

Writing Java program by implementing user-defined method with parameter and no returning value.

8.3.2 Problem Description

Modify the Java program in Module 7 (Activity 3) and write a method that displays the following patterns based on the number line entered. For example, the number of line entered for the following patterns is 6.

Pattern I	Pattern II	Pattern III	Pattern IV
1	1 2 3 4 5 6	1	1 2 3 4 5 6
1 2	1 2 3 4 5	2 1	1 2 3 4 5
1 2 3	1 2 3 4	3 2 1	1 2 3 4
1 2 3 4	1 2 3	4 3 2 1	1 2 3
1 2 3 4 5	1 2	5 4 3 2 1	1 2
1 2 3 4 5 6	1	6 5 4 3 2 1	1

[Estimated Time: 30 Minutes]

9.4 Activity 4

8.4.1 Objective

Writing Java program by implementing user-defined method with and without parameters, with returning values.

8.4.2 Problem Description

Design a pseudocode and write a Java program that reads the scores of five subjects, calculates average and assigns grades for each subject based on the following scheme:

Grade is A if score is ≥ 80 ;
 Grade is B if score is ≥ 70 and ≤ 79 ;
 Grade is C if score is ≥ 50 and ≤ 69 ;
 Grade is D if score is ≥ 40 and ≤ 49 ;
 Grade is F otherwise.

The program should contain three methods as follow:

- i) `read_Input ()`: prompts the user to enter the scores of five subjects
- ii) `identify_Grade ()`: identify the grades for all the subject's scores
- iii) `calculate_Average`: calculates the average of five subjects

The program also should be able to display the grades of each subject and average.

[Estimated Time: 45 Minutes]

9.5 Activity 5

8.5.1 Objective

Writing Java program by implementing user defined method with parameters and returning values.

8.5.2 Problem Description

Write a method for computing tax and prints a tax table for taxable income from RM50,000 to RM60,000 with intervals of RM50 for all the following statuses:

Taxable Income	Single	Married Joint	Married Separate	Head of a House
50000	8500	7500	9000	8000
50050	8509	7508	9009	8008
...				
59950	10192	8993	10791	9592
60000	10200	9000	10800	9600

Formulas for computing tax for each categories are shown below:

$$\text{Tax for Single} = \frac{17}{100} \times \text{income}$$

$$\text{Tax for Married Join} = \frac{15}{100} \times \text{income}$$

$$\text{Tax for Married Separate} = \frac{18}{100} \times \text{income}$$

$$\text{Tax for Head of a House} = \frac{16}{100} \times \text{income}$$

Hint: round the tax into integers using Math.round

[Estimated Time: 45 Minutes]