LAB 3 – Input and Output

Objectives

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

i. To understand on how to illustrate flowchart and write pseudocode.
ii. To write a Java program that capable to obtain input using Scanner class and display the output.
iii. To write a Java program that capable to obtain input using input dialog boxes and display the output using input dialog box.

3.1 Activity 1

3.1.1 Objective

Writing a Java program using Scanner class and JOptionPane class.

3.1.2 Problem Description

Write a Java program to calculate and display the gross pay for an hourly paid employee based on the flowchart or pseudocode that you have designed in Lab Module 2 (Activity 1).

i. The program should be able to obtain input using Scanner class.
ii. Modify the program to obtain input and display output using JOptionPane input dialog box and show message dialog box

[Estimated Time: 30 minutes]

3.2 Activity 2

3.2.1 Objective

Write a Java program based on the flowchart.

3.2.2 Problem Description

Suppose your cell phone calling plan allows you to use 700 minutes per month. If you use more that this limit in a month, you are charged an overage fee of RM0.35 for each excess minute. Your phone shows you the number of excess minutes that you have used in the current month, but it does not show you how much your overage fee currently is. You would like to have a program that be able to enter the number of excess minutes, and have the program perform the calculation for you. The program should be able to receive input and display output as shown in the figure below.

```
**************************************************
MY CELL PHONE OVERAGE FEE
**************************************************
ENTER THE NUMBER OF EXCESS MINUTES: 20
OVERAGE FEE = RM 7.0
```

i. Modify the pseudocode/flowchart as designed in Lab Module 2 (Activity 3) according to the above problem.
ii. Write a Java program that should be able to obtain input using Scanner class and display the output as shown in the figure above.

[Estimate 30 minutes]

3.3 Activity 3

3.3.1 Objective

Writing flowchart, pseudocode and Java program.

3.3.2 Problem Description

Write an application that takes Celsius temperature as input and converts it to its Fahrenheit equivalent. The formula is:

$$Fahrenheit = (9/5) \times Celcius + 32$$

i. Identify the input-process-output for the above problem.
ii. Design the algorithm in pseudocode and flowchart for the above problem.
iii. Write a Java application using JOptionPane class.

[Estimated Time: 30 minutes]

3.4 Activity 4

3.4.1 Objective

Writing flowchart, pseudocode and Java program.

3.4.2 Problem Description

Suppose you want to deposit a certain amount of money into a savings account, and then leave it alone to draw interest for the next 10 years. At the end of 10 years, you would like to have RM10,000 in the account. How much do you need to deposit today to make that happen? You can use the following formula to find out:

$$P = \frac{F}{(1+r)^n}$$

where
P is the present amount that you need to deposit today
F is the future value that you want in the account
r is the annual interest rate
n is the number of years that you plan to let the money sit in the account

i. Modify the pseudocode/flowchart as designed in Lab Module 2 (Activity 4) in order to perform the calculations that can experiment with different values for the terms as depicted in the figure below.

```
**************************************************
MY SAVING FORECAST PROGRAM
**************************************************
WHAT IS THE VALUE YOU WANT TO HAVE IN YOUR ACCOUNT? RM 10000
HOW MANY YEARS YOU WANT THE MONEY TO SIT IN YOUR ACCOUNT? 10
WHAT IS THE ANNUAL INTEREST RATE (IN %)? 3.41

THE AMOUNT YOU NEED TO DEPOSIT TODAY IS RM 7151.129104174272
```

ii. Write a Java program that should be able to obtain input using Scanner class and display the output as shown in the figure above.

[Estimated Time: 30 minutes]

3.5 Activity 5

3.5.1 Objective

Writing flowchart, pseudocode and Java program.

3.5.2 Problem Description

Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters.

i. Identify the input-process-output for the above problem.
ii. Design the algorithm in pseudocode and flowchart for the above problem.
iii. Write a program that prompts the user to enter a weight and height and display the BMI result using JOptionPane class.

[Estimated Time: 30 Minutes]

3.6 Activity 6

3.6.1 Objective

Writing flowchart, pseudocode and Java program.

3.6.2 Problem Description

The total price of a product is the price of the product plus the sales tax. Suppose the sales tax is 6%. Write a program that reads the price of the product and displays the total cost of the product.

i. Identify the input-process-output for the above problem.
ii. Design the algorithm in pseudocode and flowchart for the above problem.
iii. Write a program using JOptionPane class.

[Estimated Time: 30 Minutes]