LAB 2 – Algorithm

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 java program based on flowchart and pseudocode.

2.1 Activity 1

2.1.1 Objective

Writing flowchart and pseudocode.

2.1.2 Problem Description

You have been asked to write a program to calculate and display the gross pay for an hourly paid employee. Identify the input, process and output for the problem. Design the algorithm in flowchart and pseudocode for solving the problem.

[Estimated Time: 15 minutes]

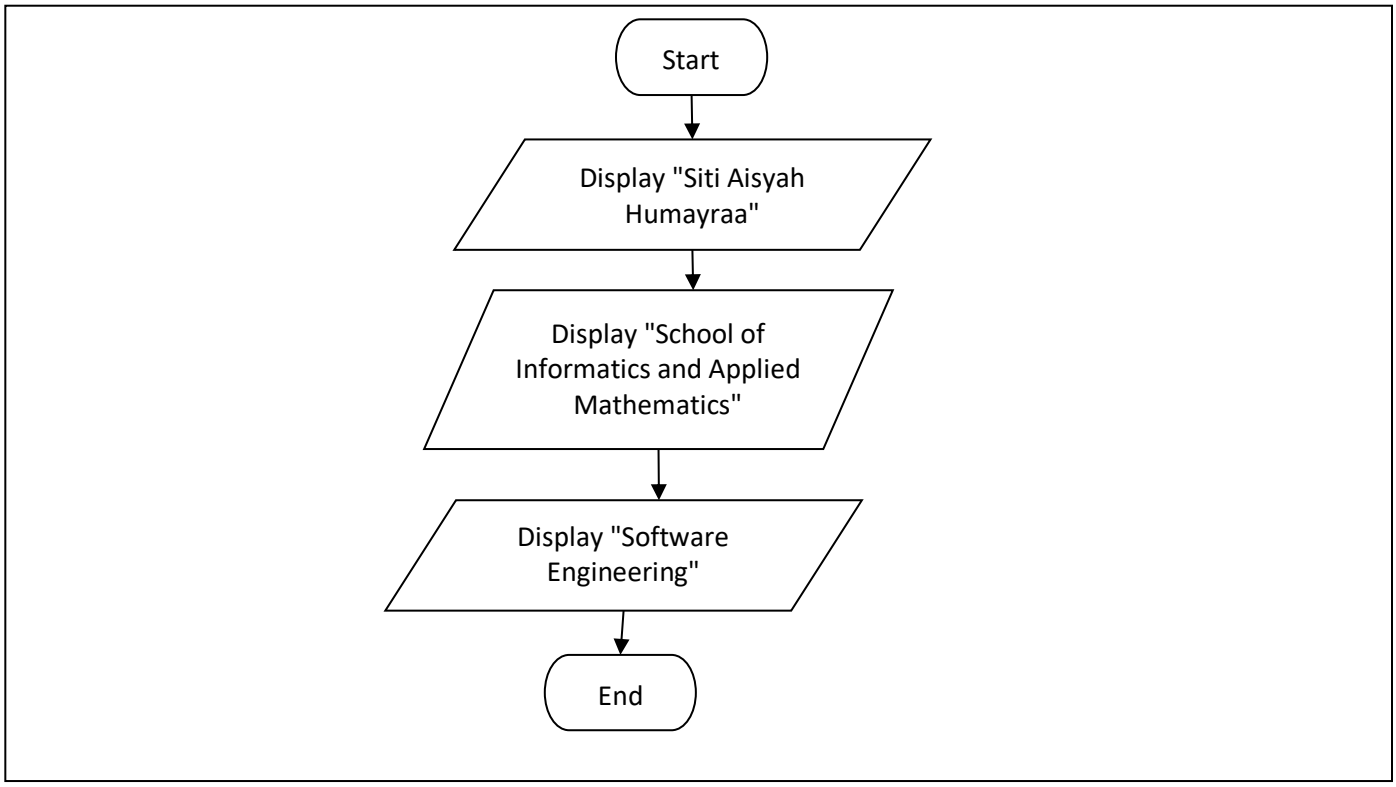
2.2 Activity 2

2.2.1 Objective

Write java program based on flowchart.

2.2.2 Problem Description

You are required to translate the following flowchart into a pseudocode. Then, write a Java program based on the given flowchart.



[Estimate 30 minutes]

2.3 Activity 3

2.3.1 Objective

Writing flowchart and pseudocode.

2.3.2 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. until now, you've been doing the math the old-fashioned way (with pencil and paper, or calculator), but you would like to design a program that will simplify the task. You would like to be bale to enter the number of excess minutes, and have the program perform the calculation for you.

i. Identify the input-process-output for the above problem.
ii. Design the algorithm in pseudocode for the above problem.
iii. Translate the pseudocode into flowchart.

[Estimated Time: 30 minutes]

2.4 Activity 4

2.4.1 Objective

Writing flowchart and pseudocode.

2.4.2 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:

$$P = \frac{F}{(1+r)^2} * n$$

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

Identify the input-process-output for the above problem. Design an algorithm in pseudocode and flowchart to perform the calculations that can experiment with different values for the terms.

[Estimated Time: 30 minutes]

2.5 Activity 5

2.5.1 Objective

Writing flowchart and pseudocode.

2.5.2 Problem Description

Rohani teaches a science class and her students are required to take three tests. She wants to write a program that her students can use to calculate their average test score. She also wants the program to congratulate the student enthusiastically if the average is greater than 95. Design the algorithm in pseudocode and flowchart for solving the problem.

[Estimated Time: 30 Minutes]

2.6 Activity 6

2.6.1 Objective

Writing flowchart and pseudocode.

2.6.2 Problem Description

Your friend Amanda just inherited a European sports car from her uncle. Amanda lives in Kuala Lumpur and she is afraid she will get a speeding summon because the car speedometer works in miles per hour. She has asked you to write a program that displays a list of speeds in miles per hour with their values converted to kilometers per hour. The formula for converting miles per hour to kilometers per hour is:

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

Your program 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 kilometers per hour.

Desing the algorithm in presudocode and flowchart for solving the problem.

[Estimated Time: 45 Minutes]