LAB OBJECTIVES

At the end of this lab activity, the students should be able to:

- Solve programming problems by applying :
  - proper flowchart drawing techniques
  - proper pseudocode writing techniques
- Apply the concepts of sequence, selection and repetition control structures in solving problems.

PRACTICE

SEQUENCE CONTROL STRUCTURE

1. Draw the **flowchart** and write the **pseudocode** to calculate the salary of an employee.
   - Initialize all the variables.
   - Get the *salary*, *bonus* and *deductions* from the user.
   - Calculate the *nett salary*.
   - Display the *salary*, *bonus*, *deductions* and *nett salary*.

SELECTION CONTROL STRUCTURE

2. Draw the **flowchart** and write the **pseudocode** to calculate the Body Mass Index (BMI) of a person.
   - Initialize all the variables.
   - Get the *height* and *weight* from the user.
   - Calculate the *BMI* (BMI = weight / height ^{2})
   - Identify the *status* based on the *BMI* and by referring to the following table. Use ***if..else if*** statement.
   - Display the *status*.

BMI	STATUS
Less than 18.5	Underweight
Less than 25.0	Normal
Less than 30.0	Overweight
More than or equal to 30.0	Obese

REPETITION CONTROL STRUCTURE

3. Pressure is defined as the force acting perpendicularly on unit area of a surface. The formula is $\frac{F}{A}$ where *F* is the force acting perpendicularly on a surface in newton (N) and *A* is the surface area, in square meters (m^2). The program must be repeated five times to find the pressure for different objects. Based on the description given, draw the **flowchart** and write the **pseudocode**.

   - Initialize all the required variables.
   - Get the inputs of *force* and *area* from the user.
   - Calculate the pressure. Display the *pressure*, *force* and *area*.
   - Repeat the whole process 5 times using a ***do-while*** *loop* for different objects.

4. The weight of an object is defined as the force of gravity which is exerted on it by Earth. Scientists put that sentence into an equation by writing $w = m \times a$ where w is the weight of an object, m represents the mass of an object and a represents the acceleration of gravity. You are required to calculate the weight of 4 different objects. Therefore, the program is required to be repeated 4 times so that 4 new sets of data can be entered to get the respective weights. Based on the description given, draw the **flowchart** and write the **pseudocode**.

   - Initialize all the required variables.
   - Get the inputs of *mass* and *acceleration* from the user.
   - Calculate the weight. Display the *weight, mass* and *acceleration*.
   - Repeat the whole process 4 times using a ***for*** *loop* for different objects.

SUBMISSION

Table 1 shows the revenue and cost of E&A Company for the past three months. Draw **flowchart** and write **pseudocode** to help E&A Company to identify whether it is making profit or loss for each month.

	Jan	**Feb**	**March**
Revenue	20000	26000	30000
Cost	15000	20000	35000

Table 1

- Initialize all the required variables.
- Get the inputs of revenue and cost from the user.
- Display the profit/loss status. Use ***if-else*** to examine if revenue is greater than cost.
- Repeat the process by using ***while*** loop.

OUTPUT SCREEN

```
Enter revenue:20000
Enter cost:15000
Profit

Enter revenue:26000
Enter cost:20000
Profit

Enter revenue:30000
Enter cost:35000
Loss
```