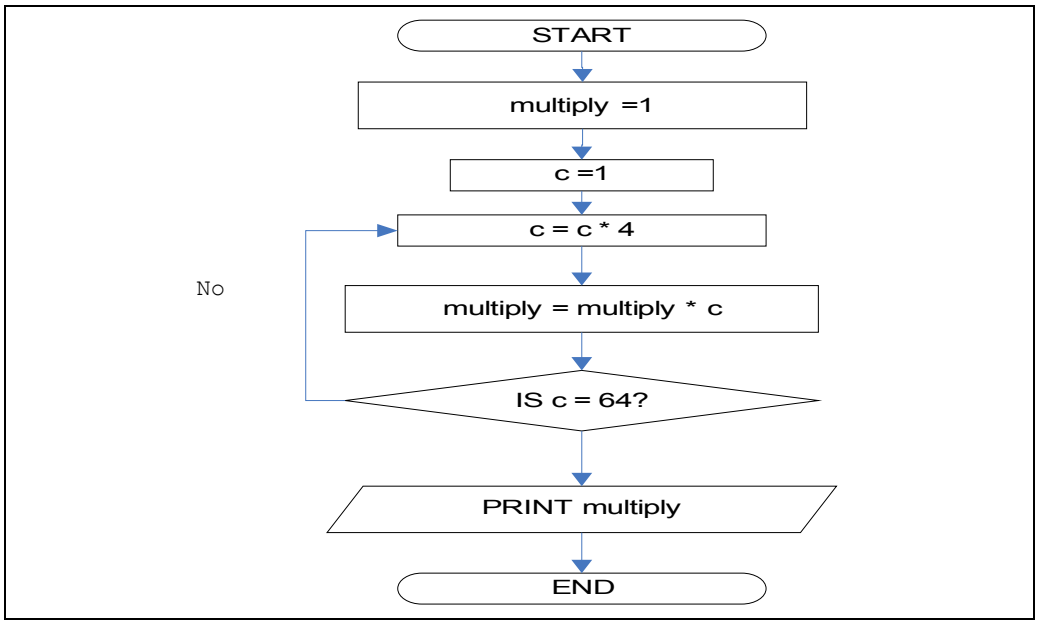
REVISION: REPETITION & SELECTION

Question 1

Write a program based on the following flowchart:



Question 2

Given below are the pH scales to measure the degree of acidity or the alkalinity of a solution.

pH	Description
0 – 1	Very acidic
2 – 6	Acidic
7	Neutral
8 – 11	Alkaline
12 – 14	Very alkaline

Draw a flowchart to determine whether the pH value is very acidic, acidic, neutral, alkaline or very alkaline.

Question 3

Write a program that calculates `1+2+3+.....+n`, where `n` is an integer value. Then, compare the calculation to the formula of `n*(n+1)/2`. If the values are same, then print a message as stated in the sample output,
"`Both values are the same which is <<value>>`".

Sample output:

```
Enter a number: 4
Both values are the same which is 10
```

Question 4

A college has a list of test results (1 = pass, 2 = fail) for 10 students. Write a program that analyzes the results by displaying the number of passes and failures. If more than 5 students pass, print "Raise Tuition".

```
Enter Result (1=pass,2=fail): 1
Enter Result (1=pass,2=fail): 2
Enter Result (1=pass,2=fail): 2
Enter Result (1=pass,2=fail): 1
Enter Result (1=pass,2=fail): 1
Enter Result (1=pass,2=fail): 1
Enter Result (1=pass,2=fail): 2
Enter Result (1=pass,2=fail): 1
Enter Result (1=pass,2=fail): 1
Enter Result (1=pass,2=fail): 2
Passed 6
Failed 4
Raise Tuition
```

Question 5

Develop a program that will process an arbitrary number of grades each time the program is run. The program counts the total number of grades that were input. A user can stop entering the grade by pressing the '?' key. The program will then display the total number of grades. The grades can either be A, B, C, D or F

```
Enter the letter grades.
Enter the ? character to end input.
A
B
C
C
A
D
F
C
M
Incorrect letter grade entered. Enter a new grade.
D
A
B
?

Totals for each letter grade are:
A: 3
B: 2
C: 3
D: 2
F: 1
```

Question 6

a) Write a complete C program to compute the average blood pressure measurement entered for *n* number of patients. Each patient will have TWO (2) blood pressure measurements. These are the requirements:

- Get number of patients from user.
- Get TWO (2) blood pressures from user for each patient and calculate the blood pressure's average.
- Then, display the average of the blood pressure in two decimal places for each patient**.**
- This process will repeat as many as number of patients.

b) Draw a flowchart for this program.

Sample output:

```
How many patients? 2

Patient 1
        Blood Pressure 1:  101.25
        Blood Pressure 2:  115.55
        Average:  108.40

Patient 2
        Blood Pressure 1:  99.22
        Blood Pressure 2:  98.58
        Average:  98.90

Press any key to continue…….
```

Question 7

Write a program that converts gallons to litres. The program should ask for two values, **first** and **last** gallon values. And then ask for gallon increment and store in variable **X**. Display gallons from the **first** to **last** gallon values in **X**-gallon increments and the corresponding litre equivalents.
Use the relationship that 1 gallon contains 3.785 litres.

(Note: You must use repetition structure in your program)

Sample output:

```
First gallon: 10
Last gallon:  16
Gallon increment: 2

Gallon      Litre
10          37.85
12          45.42
14          52.99
16          60.56
```

Question 8

Write your program in the next page that helps Shabab Cools Sdn. Bhd. to calculate the payment for ice creams sold to the customers. Given below are the flavours and prices:

ID	Flavour	Price (RM)
1	Strawberry	3.10
2	Chocolate	3.20

Your program should allow the customer to use the system until he/she choose to exit the system. A customer buys the ice cream by entering the ID and its quantity. Your program should be able to display an appropriate message if the customer input other than ID 1 and 2. Finally, the program should display the total price of the ice cream. The total price must be in 2 decimal places.

Sample output:

```
Menu
1. Strawberry
2. Vanilla
3. Exit
```

Enter your option: **1**
How many ice-cream? **2**

Enter your option: **4**
Invalid flavour. Enter again.

Enter your option: **2**
How many ice-cream? **2**

Enter your option: **3**

Please pay RM12.60