**LAB EXERCISE 1 (SECJ1013)**

**PROGRAMMING TECHNIQUE 1**

**SEM 1, 2024/2025**

## INSTRUCTIONS TO THE STUDENTS

- *This exercise must be done **individually**.*
- *Answer all questions.*
- *Your solution must follow the input and output as required in the text and shown in the examples. You must test your solution with (but not limited to) all the input given in the examples.*
- *Any form of plagiarisms is **NOT ALLOWED**. Students who copied other students' assignments will get **ZERO (0)** marks (both parties, students who copied, and students that share their work).*
- *Please insert your **name, matric number, and date** as a comment in your solution.*

## SUBMISSION PROCEDURE

- *Please submit this exercise no later than **October 22, 2024, Tuesday (00:00 MYT)**.*
- *Only one file is required for the submission which is the flow chart (the file with the extension .pdf).*
- *Submit the assignment via the UTM's e-learning system.*

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**MATRICS NO. : A24CS0313**
**SECTION : 01**
**DATE : 17/10/2024**

## QUESTION 1

Construct a flow chart that reads an integer number and then calculate the sum of its digits. After that, identify whether the sum of digits for the integer is a multiple of 3, 4, and / or 5. ***Hint:*** You should use operator divide (/) and modulus (%) and also **post-test loop** to answer this question.

***Example 1***

```
Enter an integer number: 5168
8 + 6 + 1 + 5 = 20
20 is multiples of 4 and 5
```

***Example 2***

```
Enter an integer number: 9996999
9 + 9 + 9 + 6 + 9 + 9 + 9 = 60
60 is multiples of 3, 4 and 5
```

***Example 3***

```
Enter an integer number: 51684
4 + 8 + 6 + 1 + 5 = 24
24 is multiples of 3 and 4
```

***Example 4***

```
Enter an integer number: 2161
1 + 6 + 1 + 2 = 10
10 is multiples of 5
```

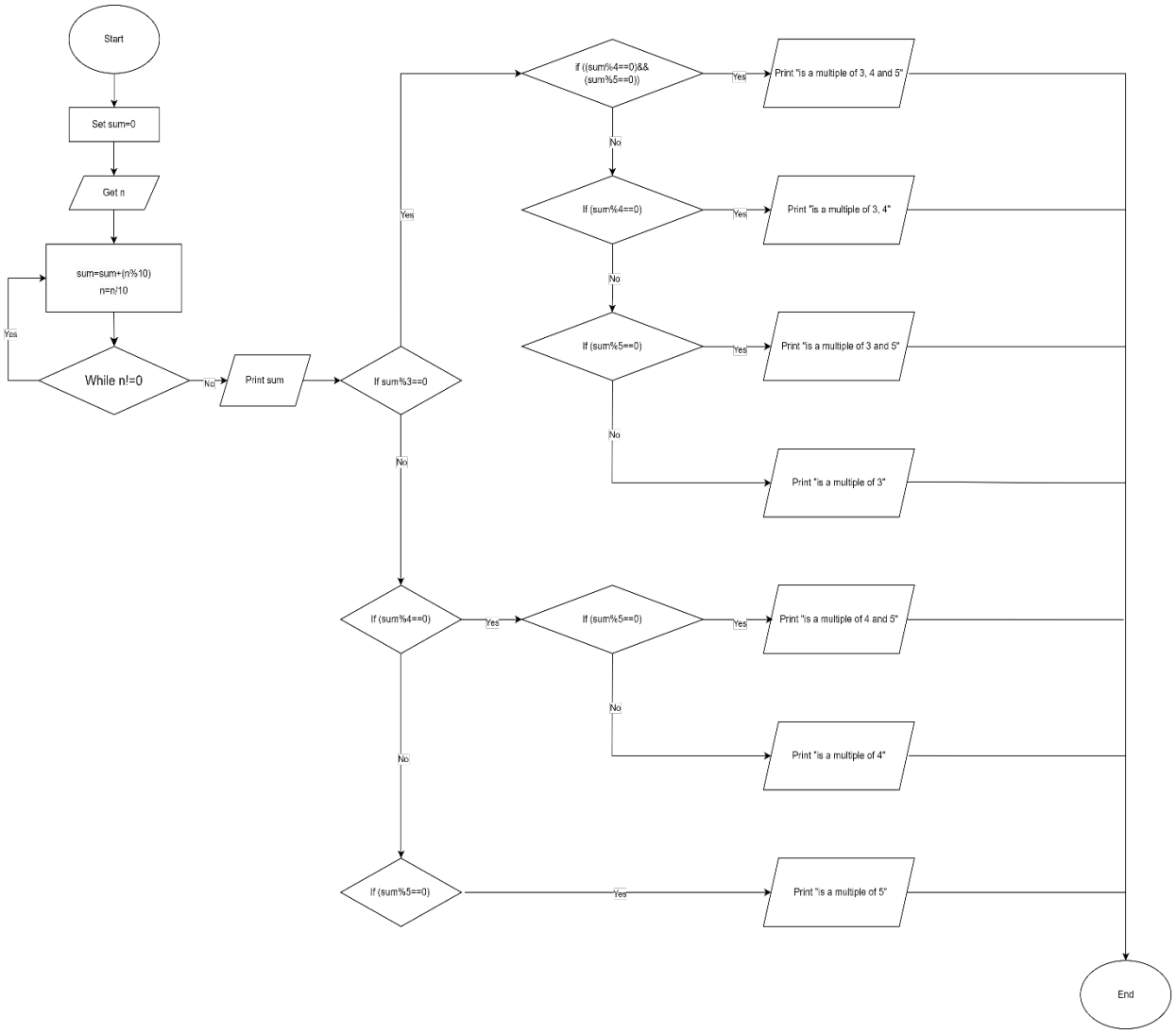
***Note:*** The number in **bold** indicates input entered by the user.

Draw your flow chart using any appropriate drawing tools such as Microsoft Visio, Lucid chart (https://www.lucidchart.com/pages/examples/flowchart-maker), and draw.io (https://app.diagrams.net/).

**Pseudo code**

1. Start
2. Set sum=0
3. Get n
4. Do
    4.1 sum=sum+(n%10)
    4.2 n=n/2
5. While (n!=0)
6. End While
7. Print sum
8. If (sum%3==0)
    8.1 If ((sum%4==0)&&(sum%5==0))
        8.1.1 Print “is a multiple of 3, 4 and 5”
    8.2 Else If (sum%4==0)
        8.2.1 Print “is a multiple of 3 and 4”
    8.3 Else If (sum%5==0)
        8.3.1 Print “is a multiple of 3 and 5”
    8.4 Else
        8.4.1 Print “is a multiple of 3”
    8.5 End If
9. Else If (sum%4==0)
    9.1 If (sum%5==0)
        9.1.1 Print “is a multiple of 4 and 5”
    9.2 Else
        9.2.1 Print “is a multiple of 4”
    9.3 End If
10. Else
    10.1 If (sum%5==0)
        10.1.1 Print “is a multiple of 5”
    10.2 End If
11. End If
12. End

## Flow Chart


Start
Set sum=0
Get n
sum=sum+(n%10)
n=n/10
While n!=0
Yes
No
Print sum
If sum%3==0
Yes
No
If ((sum%4==0)&&
(sum%5==0))
Yes
Print "is a multiple of 3, 4 and 5"
No
If (sum%4==0)
Yes
Print "is a multiple of 3, 4"
No
If (sum%5==0)
Yes
Print "is a multiple of 3 and 5"
No
Print "is a multiple of 3"
If (sum%4==0)
Yes
If (sum%5==0)
Yes
Print "is a multiple of 4 and 5"
No
Print "is a multiple of 4"
No
If (sum%5==0)
Yes
Print "is a multiple of 5"
End

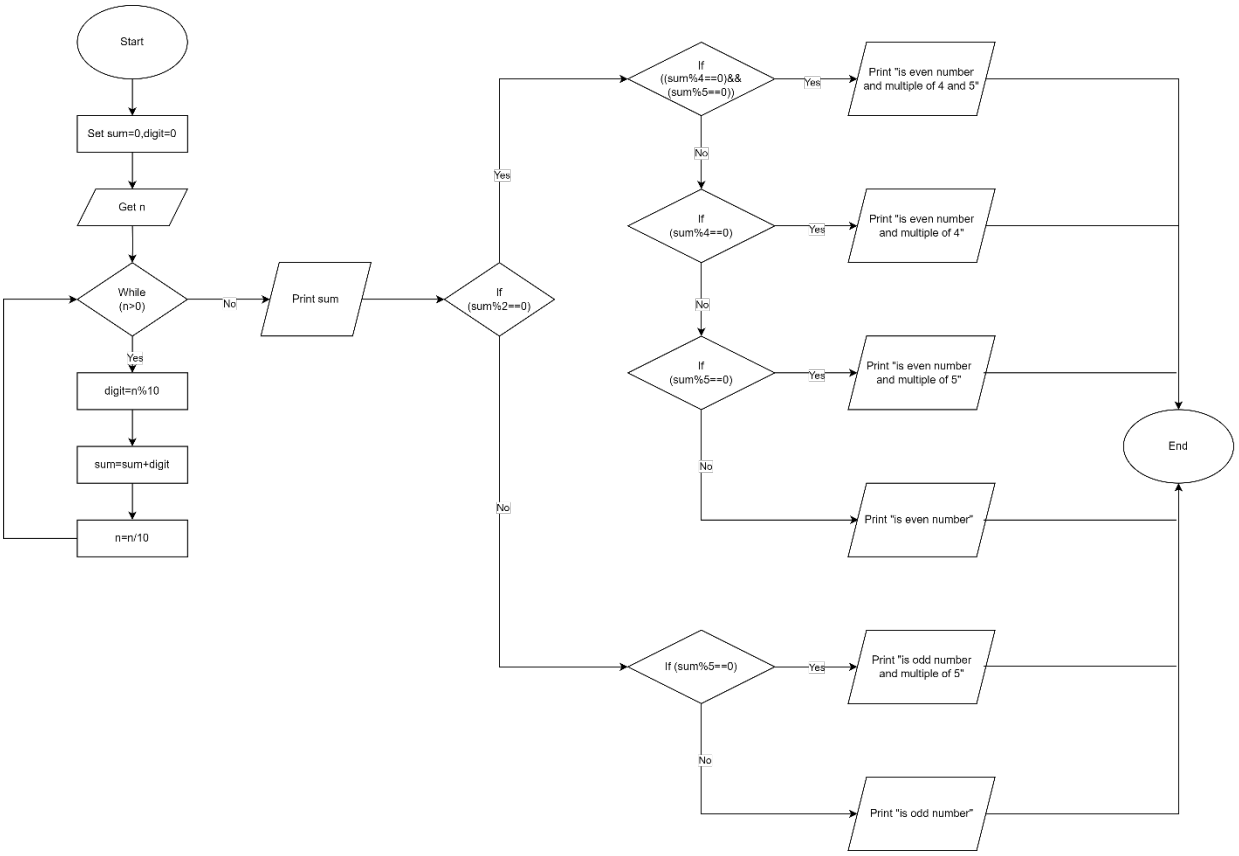
## QUESTION 2

Construct a flow chart that reads an integer number and then calculate the sum of its digits. After that, identify whether the sum of digits for the integer is an even or odd number, and a multiple of 4, and/ or 5. ***Hint:*** You should use operator divide (/) and modulus (%) and also **pre-test loop** to answer this question.

**Pseudo Code**

1. Start
2. Set digit = 0 and sum = 0
3. Read num
4. While (num > 0)
    4.1. digit = num%10
    4.2. sum = sum + digit
    4.3. num = num/10
5. End While
6. Print sum
7. If (sum%2 == 0)
    7.1. If ((sum%4 == 0) && (sum%5 == 0))
        7.1.1. Print " is even number & multiples of 4 and 5"
    7.2. Else If (sum%4 == 0)
        7.2.1. Print " is even number & multiples of 4"
    7.3. Else If (sum%5 == 0)
        7.3.1. Print " is even number & multiples of 5"
    7.4. Else
        7.4.1. Print " is even number"
        7.4.2. Go to step 9
        7.5. End If
8. Else
    8.1. If (sum% 5 == 0)
        8.1.1. Print " is odd number & multiples of 5"
    8.2. Else
        8.2.1. Print " is odd number"
        8.2.2. Go to step 9
    8.3. End If
9. End If
10. End

## Flow Chart


Start
Set sum=0,digit=0
Get n
While (n>0)
No
Print sum
If (sum%2==0)
Yes
digit=n%10
sum=sum+digit
n=n/10
If ((sum%4==0)&& (sum%5==0))
Yes
Print "is even number and multiple of 4 and 5"
No
If (sum%4==0)
Yes
Print "is even number and multiple of 4"
No
If (sum%5==0)
Yes
Print "is even number and multiple of 5"
No
Print "is even number"
No
If (sum%5==0)
Yes
Print "is odd number and multiple of 5"
No
Print "is odd number"
End