

**TUTORIAL 1-1 (SECJ1013)**  
**PROGRAMMING TECHNIQUE 1**  
**SECTION 04 & 07, SEM 1, 2024/2025**

**QUESTION 1**

Determine the output for each run of the pseudo code in **Figure 1** for the given inputs in **Table 1**.  
1. Write your answers in **Table 1**.

```
1. Start
2. Read  $m, n$ 
3. If  $m$  is greater than  $n$ 
    3.1 If  $m$  is greater than 10
        3.1.1 If  $n$  is greater than 10
            3.1.1.1  $x = m / 5 * n$ 
        3.1.2 Else
            3.1.2.1  $x = m + n$ 
        3.1.3 End_If
    3.2 Else
        3.2.1  $x = m * n$ 
    3.3 End_If
4. Else
    4.1 If  $m$  is equal to  $n$ 
        4.1.1  $x = (m + n) / 2$ 
    4.2 Else
        4.2.1  $x = 0$ 
    4.3 End_If
5. End_If
6. Print  $x$ 
7. End
```

**Figure 1:** Pseudo code

**Table 1:** Tracing table

	$m$	$n$	Output
●	12	● 5	17
●	15	● 10	25
●	5	● 17	0
●	8	● 8	8
●	20	● 15	60

## QUESTION 2

Trace the following pseudo code as in Algorithm 1, using the input values given in **Table 2**. Record the output statements.

### Algorithm 1: Trace the output of nested if statement

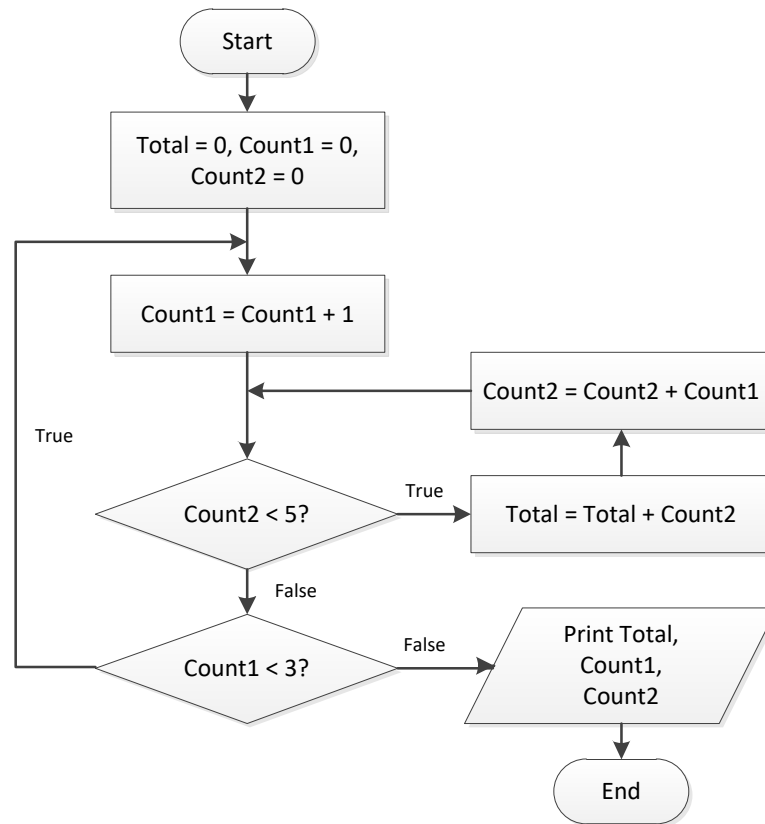
```
1.  Start
2.  Read i
3.  If (i>3.0)
    3.1  If
        3.1.1  If (i<12.0)
            3.1.1.1  j = i / 100 x 5
        3.1.2  Else
            3.1.2.1  j = 10 / i x 2.5
        3.1.3  End_Else
    3.2  End_If
4.  Else
    4.1  j = 5.5 x i / 2
5.  End_If
6.  Display j
7.  End
```

**Table 2**

Input Value	Output Statement
5.0	0.25
3.0	8.25
2.5	6.875
15.0	0.267
12.0	
11.5	

### QUESTION 3

Trace the execution of the in **Figure 2** by filling in the tracing table in **Table 3**.



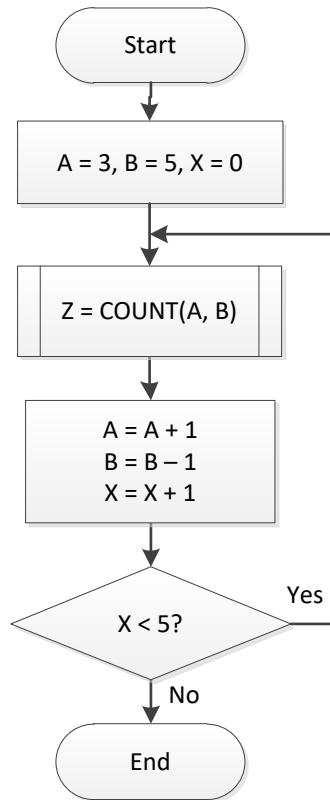
**Figure 2:** Flowchart

**Table 3:** Tracing table

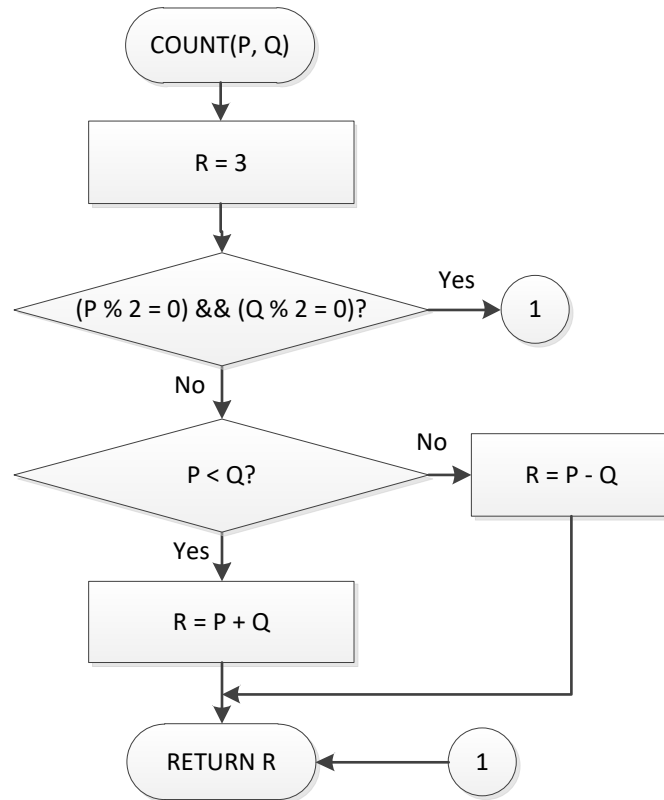
Count1	Count2	Total	Count2 < 5	Count1 < 3	Output
0	0	0	true		
1	1	0	true		
1	2	1			

#### QUESTION 4

Trace the execution of the flowchart in **Figure 3** and **Figure 4** by filling in the tracing tables in **Table 4** and **Table 5** accordingly.



**Figure 3:** Flowchart 1



**Figure 4:** Flowchart 2

**Table 4:** Tracing table 1

A	B	X	X<5	Z

**Table 5:** Tracing table 2

P	Q	R	(P % 2 = 0) && (Q % 2 = 0)	P<Q

### QUESTION 5

Draw a flowchart that has a nested loop to collect data and calculate the average rainfall over a period of years. First, the program should ask for the number of years. The outer loop will iterate once for each year. The inner loop will iterate 12 times for each year. Each iteration of the inner loop will ask the user for the amount of rainfall for that month. After all iterations, the program should display the number of months, the total amount of rainfall, and the average rainfall per month for the entire period.

**Input Validation:** Do not accept a number less than 1 for the number of years. Do not accept negative numbers for the monthly rainfall.

### QUESTION 6

Construct a pseudo code or flowchart which reads an integer,  $n$ . Then, using nested loop, display the triangle of + such as depicted in Figure 1, if the input value  $n = 5$ .

```

+   +   +   +   +
+   +   +   +
+   +   +
+   +
+
+   +
+   +   +
+   +   +   +
+   +   +   +   +

```

**Figure 5**

### QUESTION 7

Draw a flowchart which reads in two integer values. Then, display all the numbers that is located between the two numbers. Please consider the following conditions:

- If the first number entered is smaller than the second number entered, print all numbers in ascending.
- If the first number entered is greater than the second number entered, print all numbers in descending order.

**Table 6** shows an examples of input and output. The user's input is shown in **bold**.

**Table 6:** Examples of input and output

Example	Input	Output
1	3 8	3 4 5 6 7 8
2	15 12	15 14 13 12
3	4 4	<i>No output will be displayed</i>
4	19 23	19 20 21 22 23

### QUESTION 8

Write a pseudo code for a program that will implement the following decision table in **Table 7**. The program will print the input grade point and the class of degree based on a user input. The program will terminate the loop when a user input a sentinel value other than ‘y’ or ‘Y’.

**Table 7**

Grade Point	Output
0.00 – 0.99	Failed
1.00 – 2.00	General degree
2.01 – 2.70	Second class lower
2.71 – 3.69	Second class upper
3.70 – 4.00	First class