

PART A: STRUCTURED QUESTIONS

QUESTION 1

[8 MARKS]

Trace the execution of the flowchart in **Figure 1** by filling in the tracing table in **Table 1**.

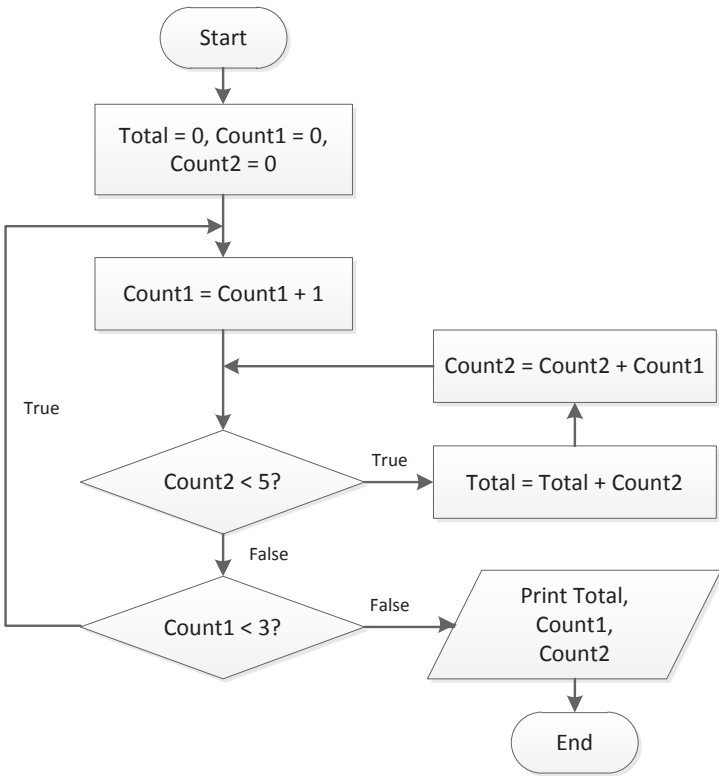


Figure 1: Flowchart

Table 1: Tracing table

Count1	Count2	Total	Count2 < 5	Count1 < 3	Output
0	0	0			
1			TRUE		
	1	0	TRUE		
	2	1	TRUE		
	3	3	TRUE		
	4	6	TRUE		
	5	10	FALSE	TRUE	
2			FALSE	TRUE	
3			FALSE	FALSE	10, 3, 5

QUESTION 2**[5 MARKS]**

Determine the output for each run of the pseudo code in **Figure 2** for the given inputs in **Table 2**. Write your answers in **Table 2**.

```
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 2: Pseudo code**Table 2:** Tracing table

<i>m</i>	<i>n</i>	Output
12	5	17
15	10	25
5	17	0
8	8	8
20	15	60

QUESTION 3**[11 MARKS]**

The flowchart in **Figure 3** represents 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 inches of rainfall for that month. After all iterations, the program should display the number of months, the total inches 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 4

[6 MARKS]

Mr. Akmal owns a used vehicle business, which covers both used car and used superbike. He is planning to hold a promotion to improve the sales of recent years vehicles. He employed a programmer to create a program that will calculate the discounted price of vehicle, as shown in following flowchart in **Figure 4**. Trace the output of the program based on following inputs in **Table 4**. Write your answers in **Table 4**.

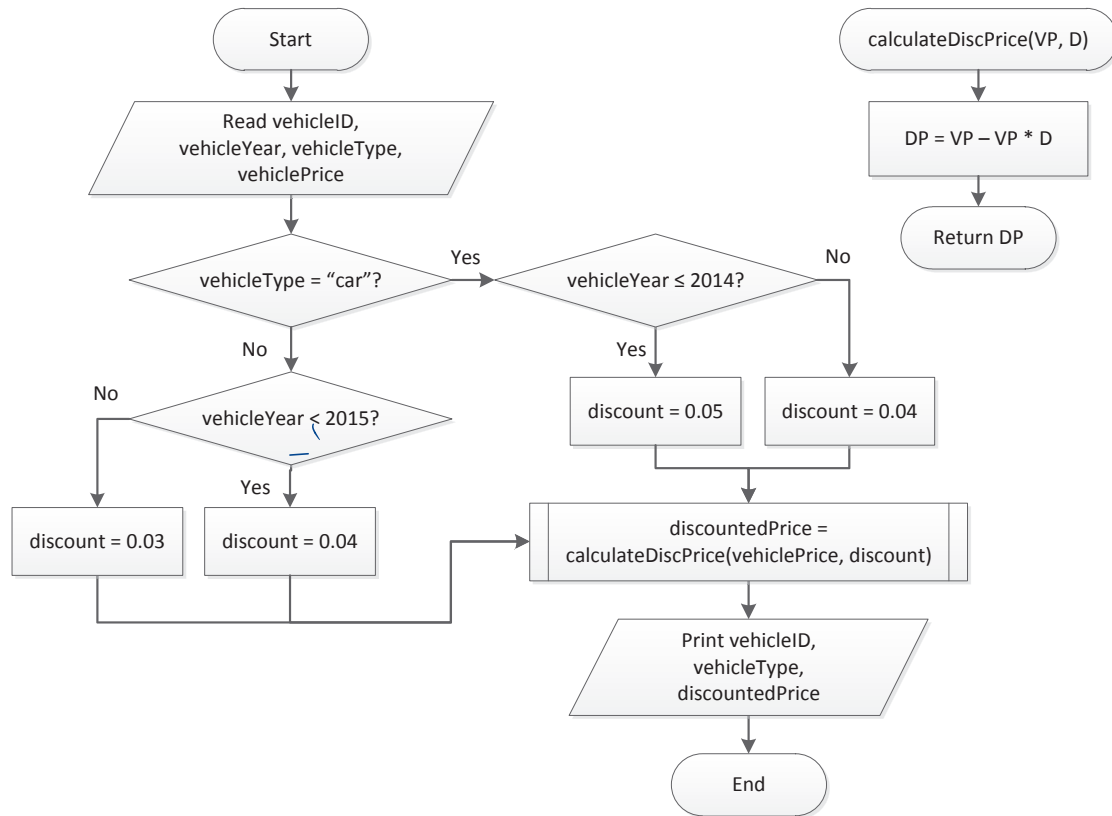


Figure 4: Flowchart

Table 4: Tracing table

No	vehicleID	vehicleYear	vehicleType	vehiclePrice (RM)	discount	discountedPrice (RM)
1.	V0001	2015	superbike	18,000.00	0.03	17460.00
2.	V0002	2012	car	55,000.00	0.05	52250.00
3.	V0003	2014	car	43,000.00	0.05	40850.00
4.	V0004	2014	superbike	21,000.00	0.04	20160.00
5.	V0005	2016	car	63,000.00	0.04	60480.00

QUESTION 6

[7 MARKS]

Trace the variables of the flowchart in **Figure 7** using the following input values:

	<u>number</u>	<u>unit</u>
(i)	0	250
(ii)	1	3500
(iii)	2	500
(iv)	3	5000
(v)	4	3000

Write your answers in **Table 7**.

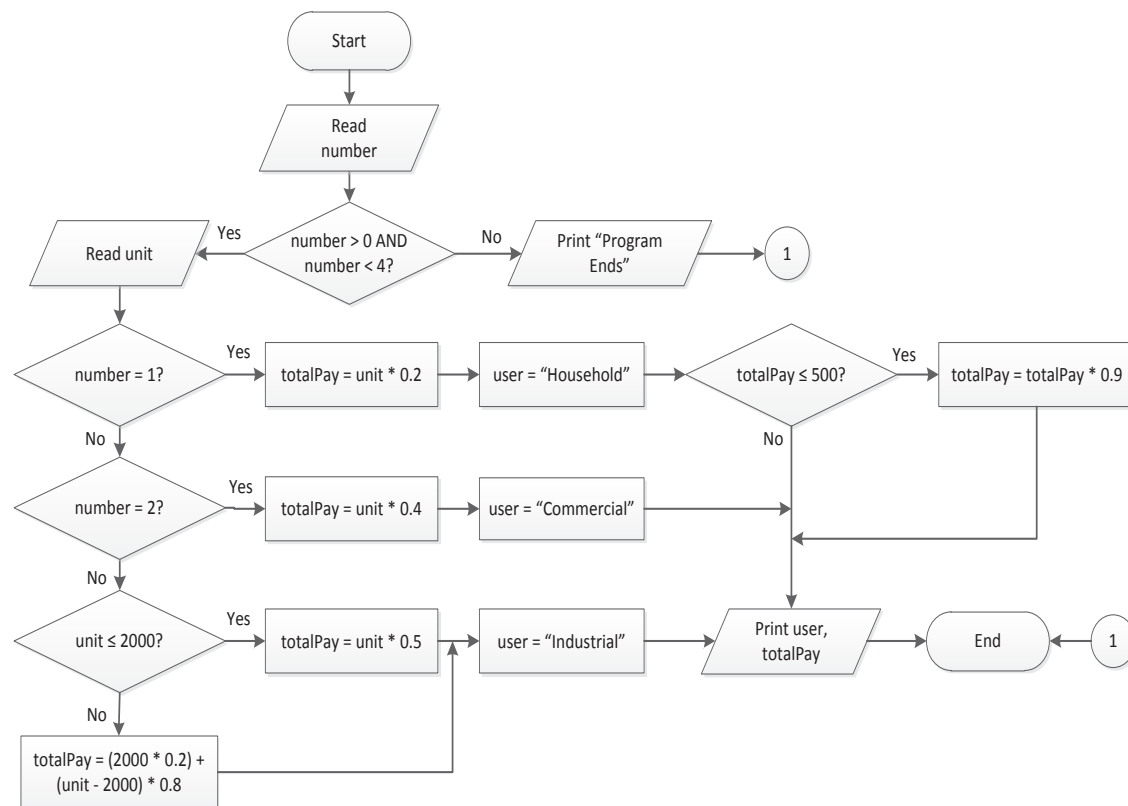


Figure 7: Flowchart

Table 7: Tracing table

No	number	totalPay	Output
(i)	0		program Ends
(ii)	1	700	Household, 700
(iii)	2	200	Commercial, 200
(iv)	3	2800	Industrial, 2800
(v)	4		program Ends

QUESTION 7**[15 MARKS]**

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:

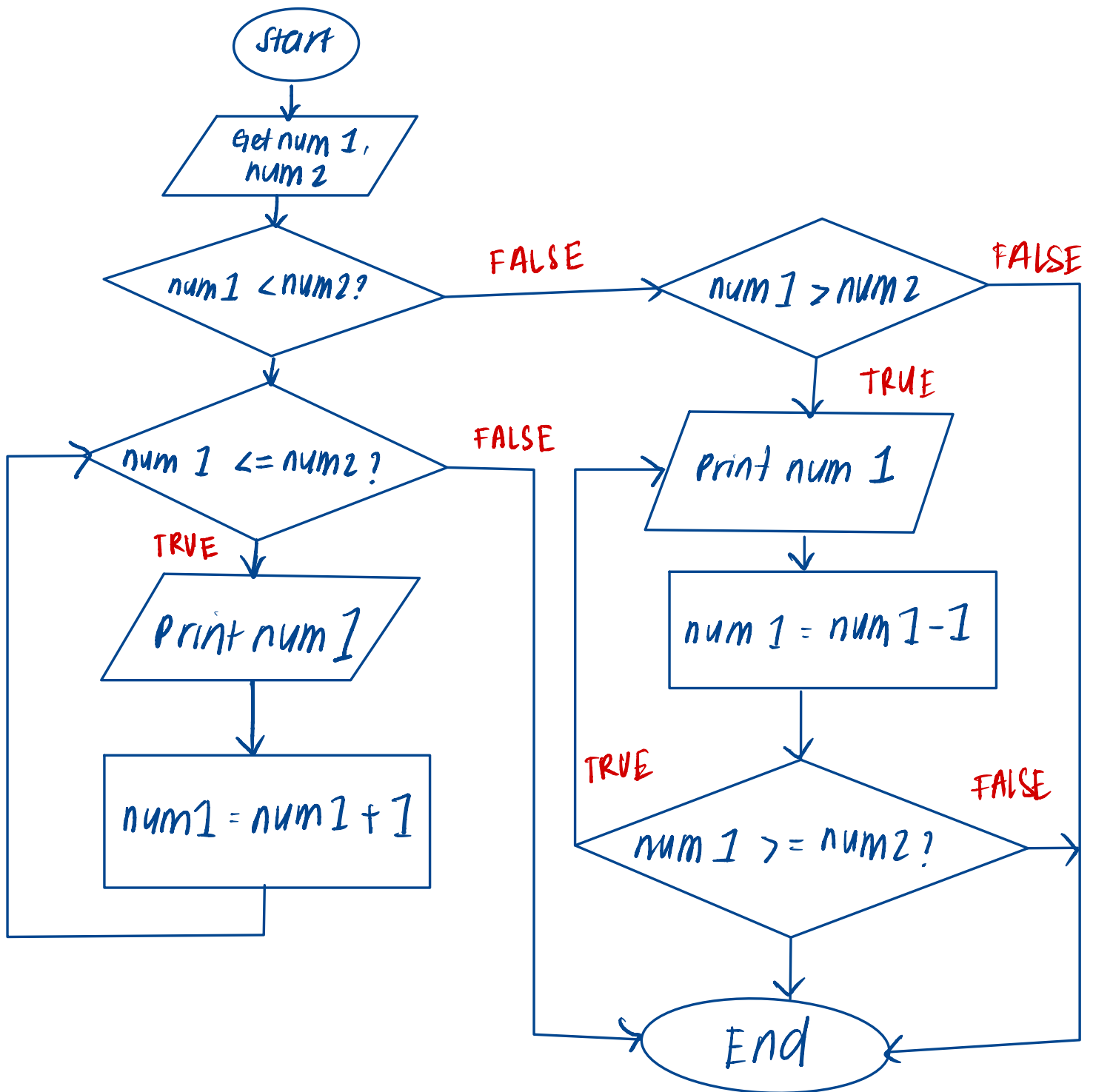
- a) If the first number entered is smaller than the second number entered, print all numbers in ascending order by using a **pre-test** loop.
- b) If the first number entered is greater than the second number entered, print all numbers in descending order by using a **post-test** loop.

Table 8 shows an examples of input and output. The user's input is shown in **bold**.

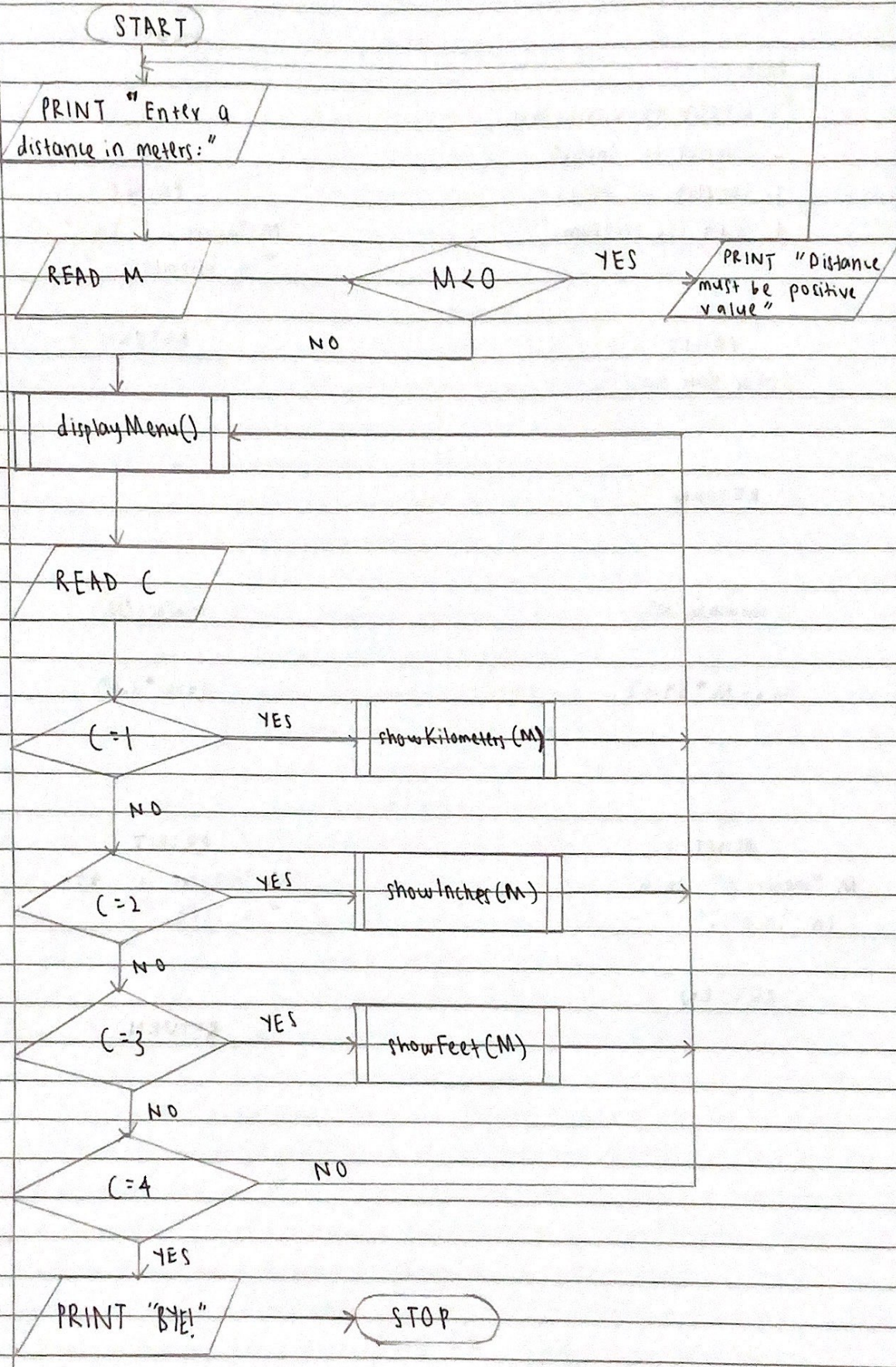
Table 8: Examples of input and output

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

(Space for Answer of Part A: Question 7)



PART B : PROBLEM SOLVING



displayMenu()

PRINT

"1. Convert to kilometres
2. Convert to inches
3. Convert to feet
4. Quit the program."

PRINT

"Enter your choice:"

RETURN

showKilometers(M)

$km = M * 0.001$

PRINT

M "meters is" km
"in kilometres."

RETURN

showInches(M)

$inch = M * 39.37$

PRINT

M "meters is" inch
"in inches."

RETURN

showFeet(M)

$ft = M * 3.281$

PRINT

M "meters is" ft
"in feet."

RETURN