



School of Computing and Information Technologies

CLASS NUMBER: 17

SECTION: 1c192

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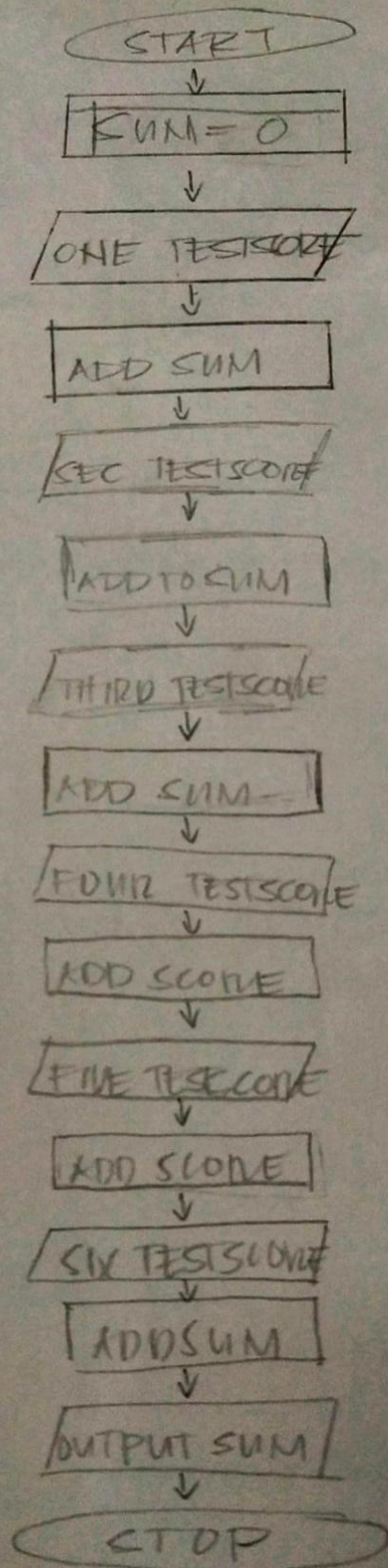
DATE: November 08, 2019

Exercise 1. Design an algorithm and the corresponding flowchart for adding the test scores as given below: 85, 65, 78, 52, 98, 83

a) Algorithm

1. START
2. Sum = 0
3. Get the first test score
4. Add first test score to sum
5. Get the second test score
6. ADD THE TWO SCORE TEST TO SUM
7. Get the ~~two~~ test score
8. Add to SUM
9. GET THE FOUR TEST SCORE
10. ADD TO SUM
11. GET THE FIVE TEST SCORE
12. ADD TO SUM
13. GET THE SIX TEST SCORE
14. ADD TO SUM
15. Output SUM
16. STOP

b) Draw the corresponding flowchart of the above algorithm





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Flowcharting Exercises

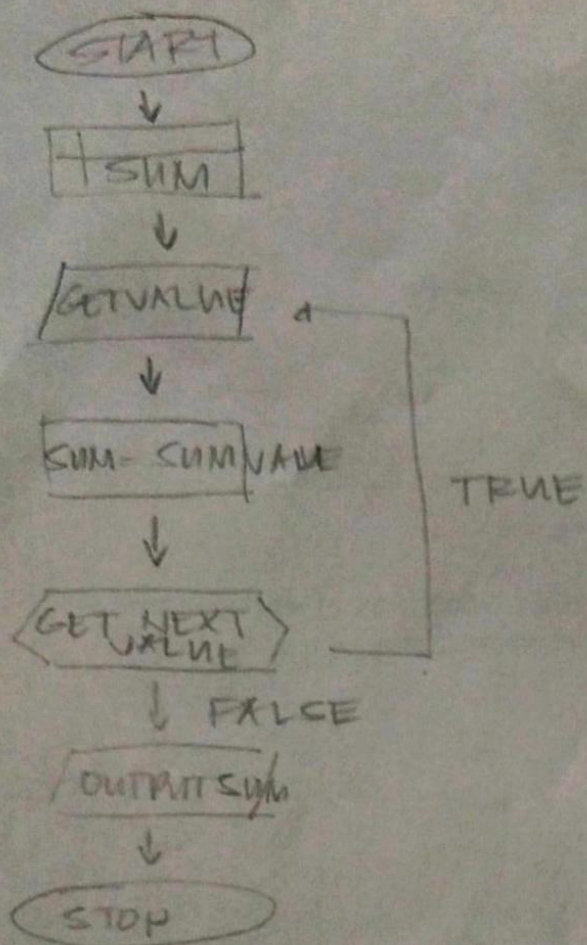
Exercise 2: The problem with the algorithm from Exercise 1 is that, some of the steps appear more than once, i.e. step 5 get second number, step 7, get third number, etc.

One could shorten the algorithm as follows:

1. Start
2. $\text{Sum} = 0$
3. Get a value
4. $\text{sum} = \text{sum} + \text{value}$
5. Go to step 3 to get next Value
6. Output the sum
7. Stop

This algorithm and its corresponding flowchart are a bit shorter than the first one. In this algorithm, step 3 to 5 will be repeated, where a number is obtained and added to sum. Similarly, the flowchart indicates a flow line being drawn back to the previous step indicating that the portion of the flowchart is being repeated.

Draw the corresponding flowchart of the above algorithm.





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Flowcharting Exercises

Exercise 3: From the exercise 2, one problem indicates that these steps will be repeated endlessly, resulting in an **endless** algorithm or flowchart.

The algorithm needs to be improved to eliminate this problem. In order to solve this problem, we need to add a last value to the list of numbers given. This value should be unique so that, each time we get a value, we test the value to see if we have reached the last value.

In this way our algorithm will be a finite algorithm which ends in a finite number of steps as shown below. There are many ways of making the algorithm finite.

The new list of numbers will be 10, 20, 300, 4000, 50000, 1, -1. The value -1 is a unique number since all other numbers are positive.

1. Start
2. Sum = 0
3. Get a value
4. If the value is equal to -1, go to step 7
5. Add to sum (sum = sum + value)
6. Go to step 3 to get next Value
7. Output the sum
8. Stop

Draw the corresponding flowchart of the above algorithm.

START



SUM = 0



GET VALUE



IS IT
-1?

TRUE

OUTPUT
SUM

FALSE

ADD VALUE
TO SUM



WANT
INPUT

FALSE

OUTPUT
SUM



STOP

TRUE