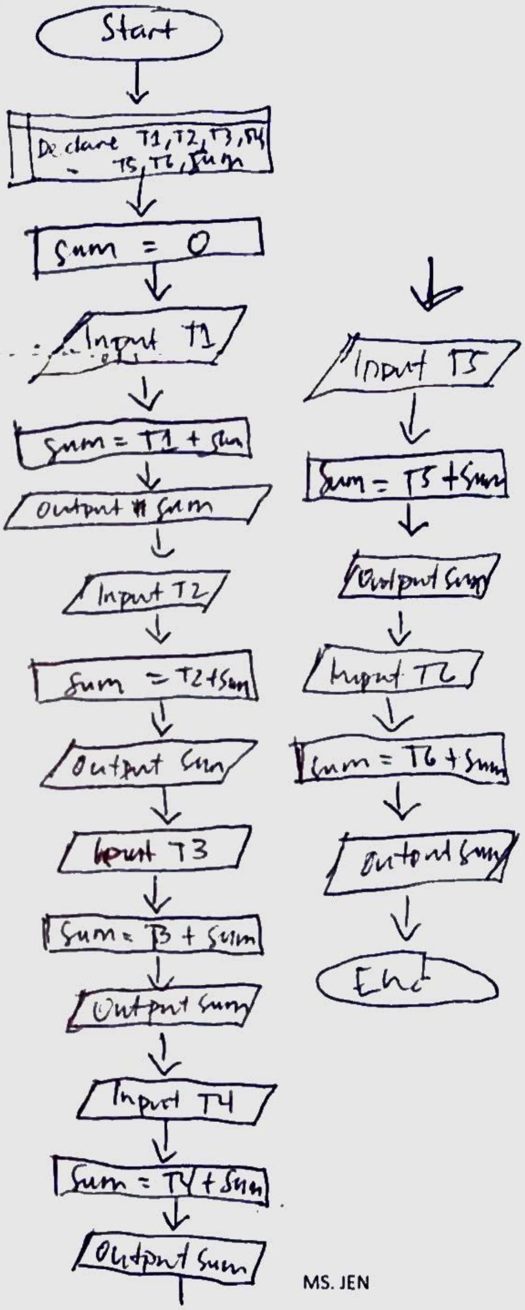
School of Computing and Information Technologies

CLASS NUMBER: 22 SECTION: AC192

NAME: SARTE, CHARLIZE MAY DATE: NOV. 6, 2019

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

Answer:



a) Algorithm

1. Start
2. Sum = 0
3. Get the first testscore
4. Add first testscore to sum
5. Get the second testscore
6. Sum = Sum + first testscore ,
7. Get the third testscore
8. Add to sum
9. Get the fourth testscore
10. Add the fourth testscore to sum
11. Get the fifth testsore
12. Add the fifth testscore to sum
13. Get the Sixth testscore
14. Add the sixth testscore to sum
15. Output
16. Stop

b) Draw the corresponding flowchart of the above algorithm

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Flowcharting Exercises

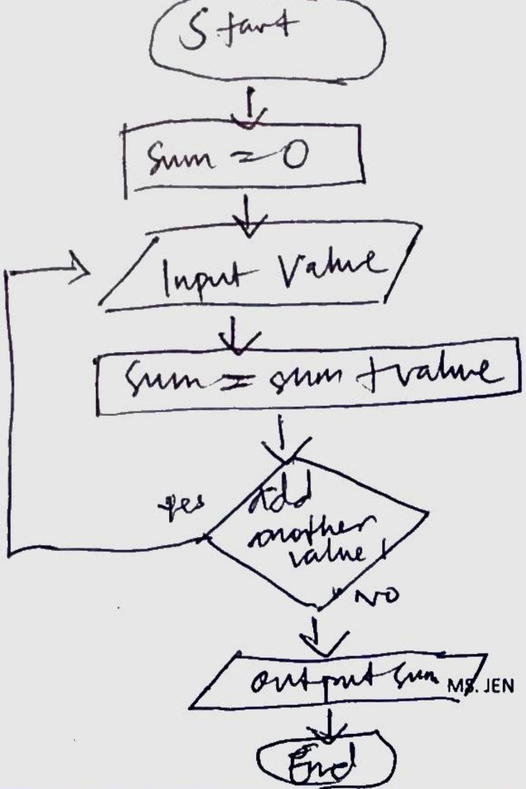
Exercise 2: The problem with the algorithm from Exercise 1 is that, some of the steps appear more than once, i.e. step 5 get second number, step 7, get third number, etc.

One could shorten the algorithm as follows:

```
1.    Start
2.    Sum = 0
3.    Get a value
4.    sum = sum + 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.

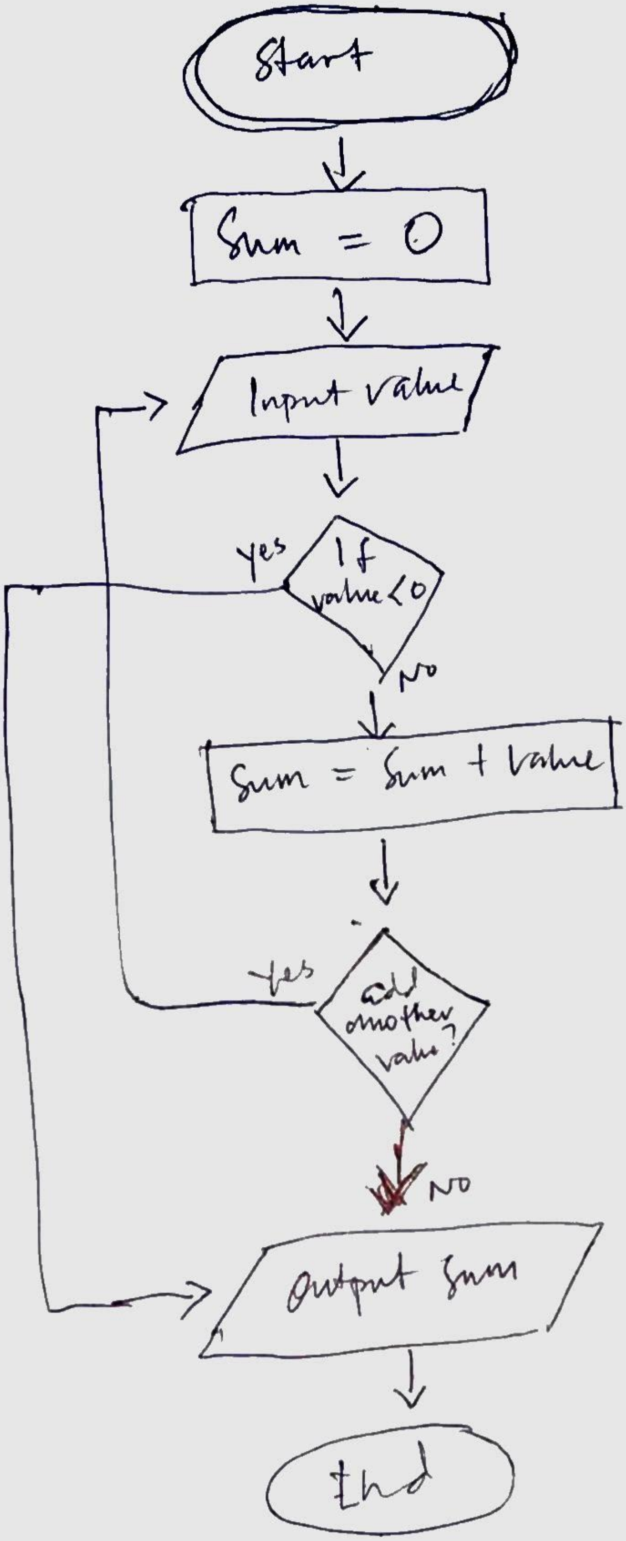
The algorithm needs to be improved to eliminate this problem. In order to solve this problem, we need to add a last value to the list of numbers given. This value should be unique so that, each time we get a value, we test the value to see if we have reached the last value.

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
Input value
If value < 0
yes
NO
Sum = Sum + value
add another value?
yes
NO
Output Sum
End