

# CSE360 Summer 2021 Assignment 6

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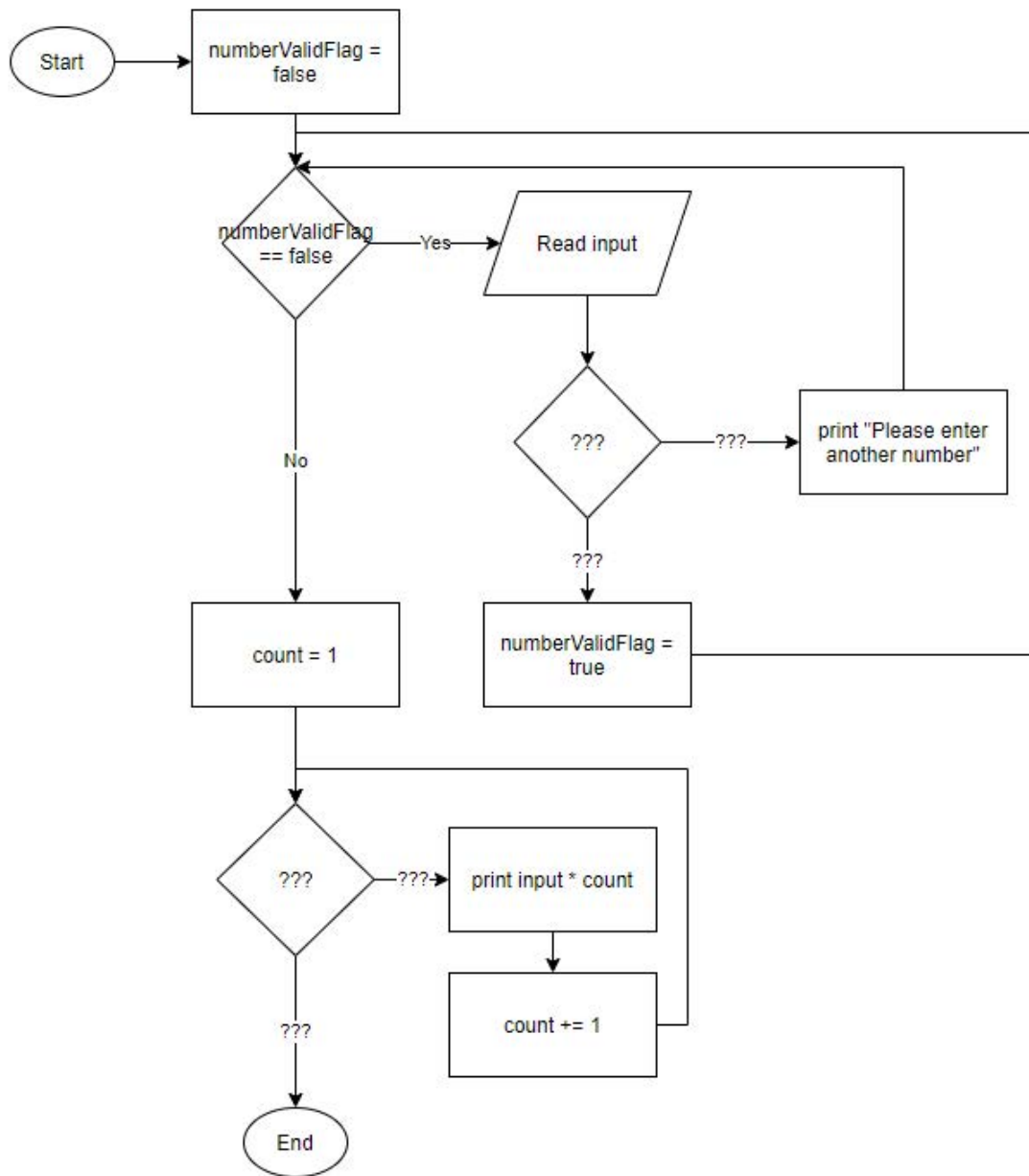
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## Problem 1

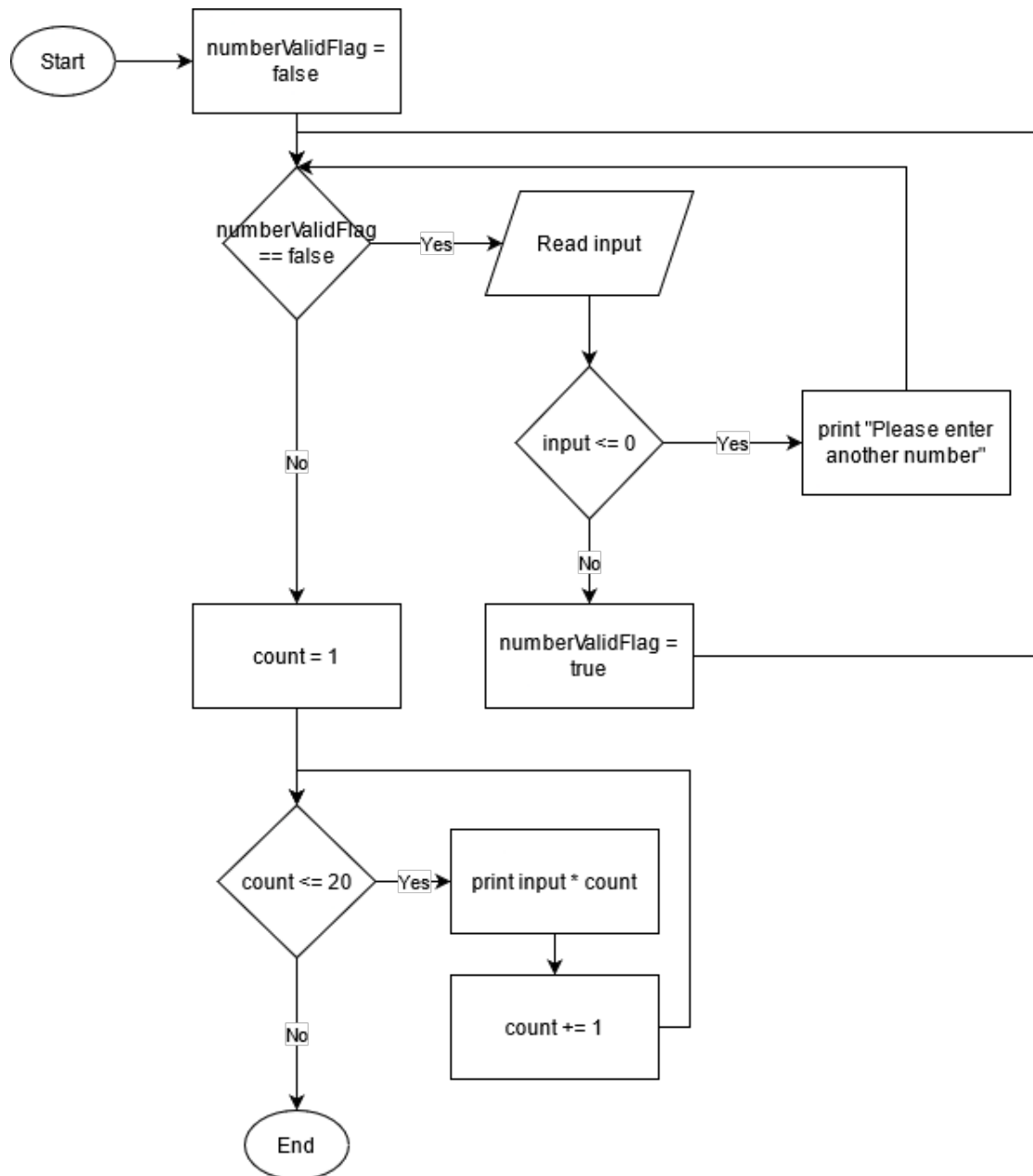
Create the flowchart, pseudocode, and Nassi-Shneiderman diagram that does the following:

- Read in a number entered by the user
- If the number is 0 or a negative number, prompt the user to enter a different number
- Multiply the input number with every number between 1 and 20 and print the result of each multiplication
- Example, let's say the user enters the number 5, the output would be: 5, 10, 15, 20, ..., 100

(a) Fill in the missing “???” parts of the below flowchart to have it model the algorithm described above.



## Solution



(b) Fill in the missing “???” parts of the pseudo-code for the algorithm described above.

```
set numberValidFlag to false
while( numberValidFlag == false )
```

```
    read input
    if( ??? )
        print \Please enter another number"
    else
        numberValidFlag = true
    end if
end while

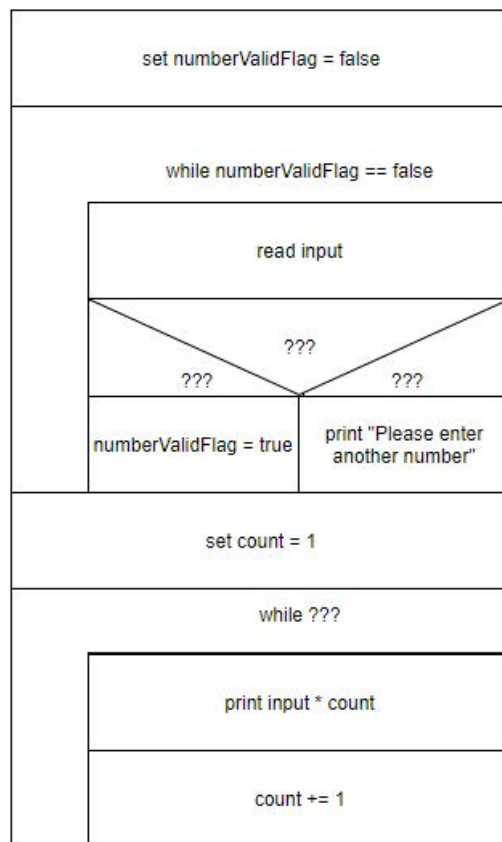
set count to 1
while ( ??? )
    print input * count
    count += 1
end while
```

## Solution

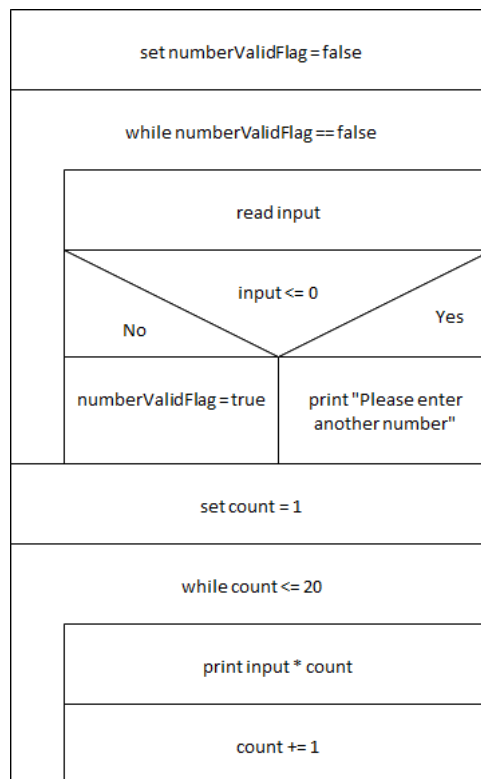
```
set numberValidFlag to false
while( numberValidFlag == false )
    read input
    if(input <= 0)
        print \Please enter another number"
    else
        numberValidFlag = true
    end if
end while

set count to 1
while (count <= 20)
    print input * count
    count += 1
end while
```

(c) Fill in the “???” part of the Nassi-Schneiderman diagram for this problem.



## Solution



## Problem 2

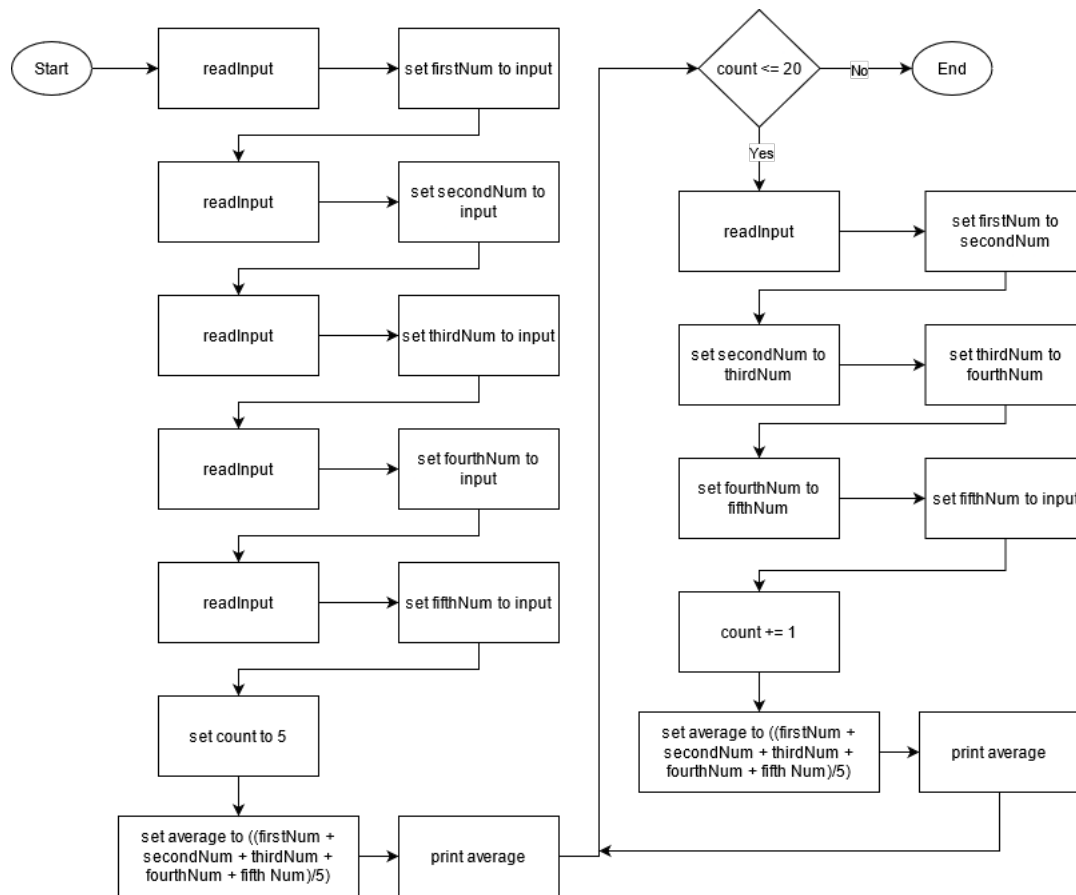
Write the algorithm for a program that calculates a moving average (also called a running average). The program will read 20 numbers from the user. As each number is read in, the average of the most recent 5 numbers will be calculated and the result is printed out.

For example,

The first five input is 1, 2, 3, 4, 5	output: $(1 + 2 + 3 + 4 + 5) / 5 = 3$
The next input is 6	output: $(2 + 3 + 4 + 5 + 6) / 5 = 4$
The next input is 7	output: 5

(a) Create a flowchart for the program.

## Solution



(b) Write the pseudocode for the program.

## Solution

```

read input
set firstNum to input
read input
set secondNum to input
read input
set thirdNum to input
read input
set fourthNum to input
read input
set fifthNum to input

```

```
set count to 5

set average to
  ((firstNum + secondNum + thirdNum + fourthNum + fifthNum)/5)

print average

while ( count <= 20 )
  read input
  set firstNum to secondNum
  set secondNum to thirdNum
  set thirdNum to fourthNum
  set fourthNum to fifthNum
  set fifthNum to input
  count += 1

  set average to
    ((firstNum + secondNum + thirdNum + fourthNum + fifthNum)/5)

  print average
end while
```

(c) Create a Nassi-Shneiderman diagram for the program.



## Solution

read input
set firstNum to input
read input
read secondNum to input
read input
read thirdNum to input
read input
set fourthNum to input
read input
set fifthNum to input
set count to 5
set average to $((\text{firstNum} + \text{secondNum} + \text{thirdNum} + \text{fourthNum} + \text{fifth Num})/5)$
print average
while count $\leq 20$
read input
set firstNum to secondNum
set secondNum to thirdNum
set thirdNum to fourthNum
set fourthNum to fifthNum
set fifthNum to input
count += 1
set average to $((\text{firstNum} + \text{secondNum} + \text{thirdNum} + \text{fourthNum} + \text{fifth Num})/5)$
print average