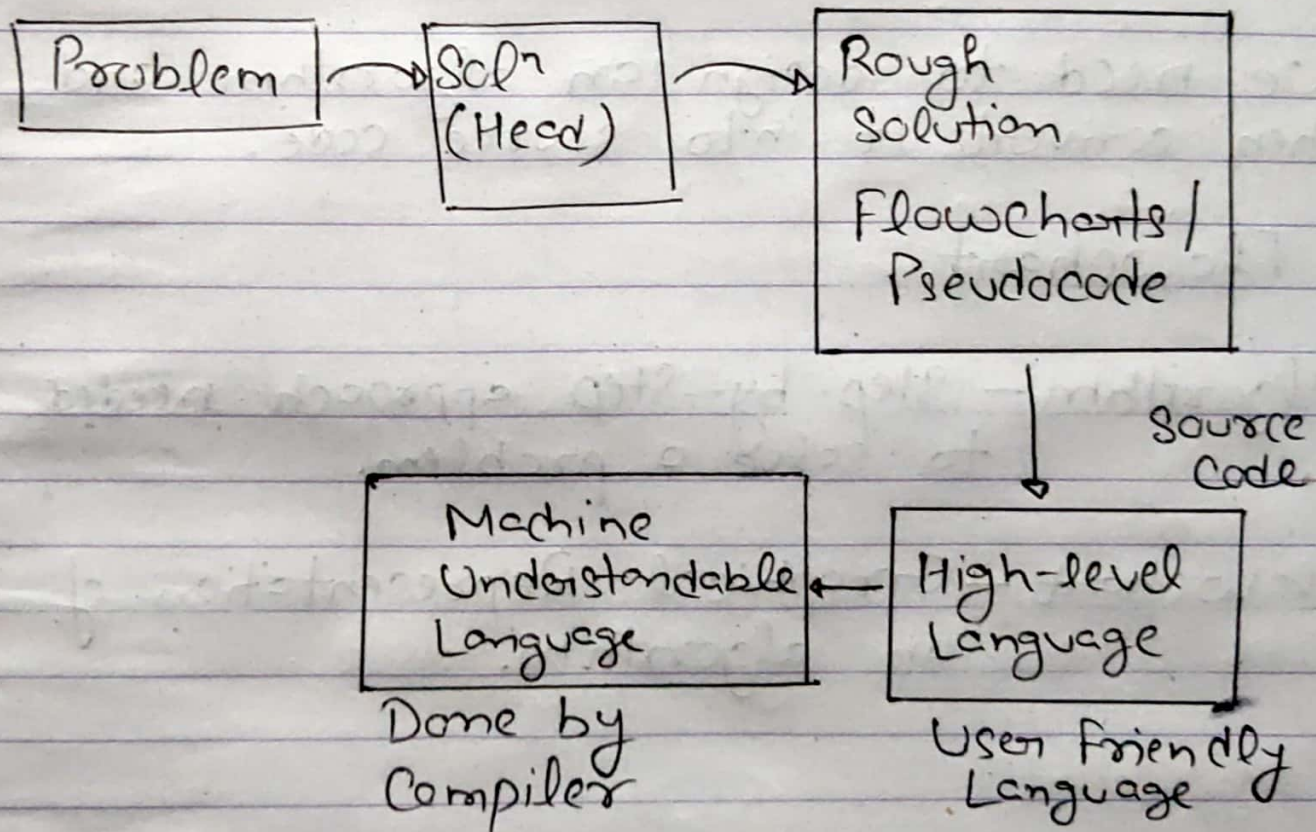


# # Programming Fundamentals

Thought Process to solve a Problem:-

1. Understand the Problem.
2. Check i/p values.
3. Approach  
↳ Compute the approach for addressing the problem.



## Using Computer to solve a Problem:-

$n=13 \rightarrow$  Prime or not

$13 \rightarrow 13/2 \rightarrow \text{rem}=1$

$13/3 \rightarrow \text{rem}=1$

$13/4 \rightarrow \text{rem}=1$

!

$13/12 \rightarrow \text{rem}=1$

This process  
is done by  
Computer.

$\rightarrow$  We need to design an algorithm and then convert it into source code.

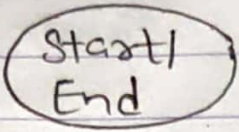
## # Flowchart

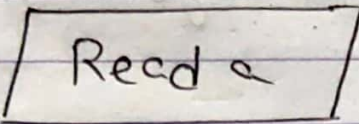
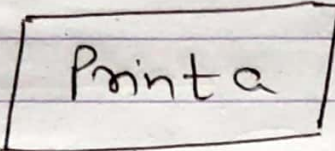
Algorithm - Step-by-Step approach needed to solve a problem.

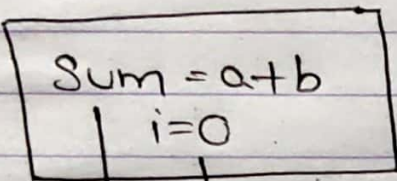
Flowchart - Graphical Representation of an algorithm.

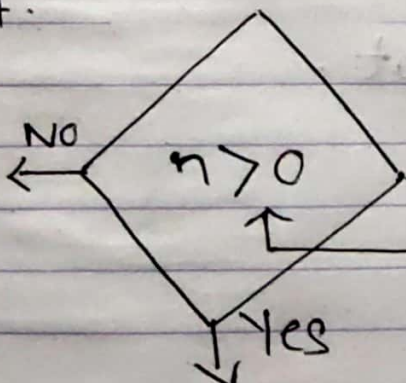



## Components :-

1.  → Terminator

2.   
or  
 → Input / Output

3.  → Process block  
↓  
Initialization  
Calculation

4.  → Decision making block  
Condition

5.  → Flow

6.  $\textcircled{A} \rightarrow$  Connector

## # PseudoCode

$\rightarrow$  Generic way of representing an algorithm in normal english language.

Eg:- Give sum of two number.

Start Program

Enter two number A, B

Add the numbers together

Print sum

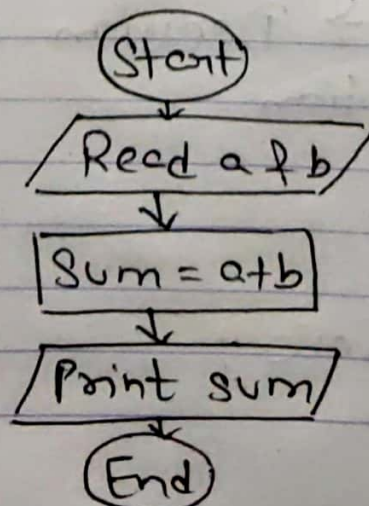
End Program

$\rightarrow$  Pseudocode does not have unique answer.

Practice:-

I. Add 2 numbers by taking input.

① flowchart





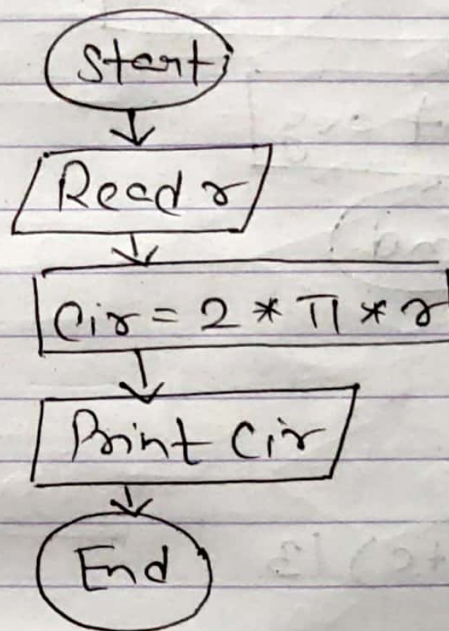
## ② Pseudocode

- ① Read  $a, b$
- ②  $sum = a + b$
- ③ Print  $sum$

## II. Find circumference of a circle.

$$Circumference = 2\pi r$$

### ① Flowchart

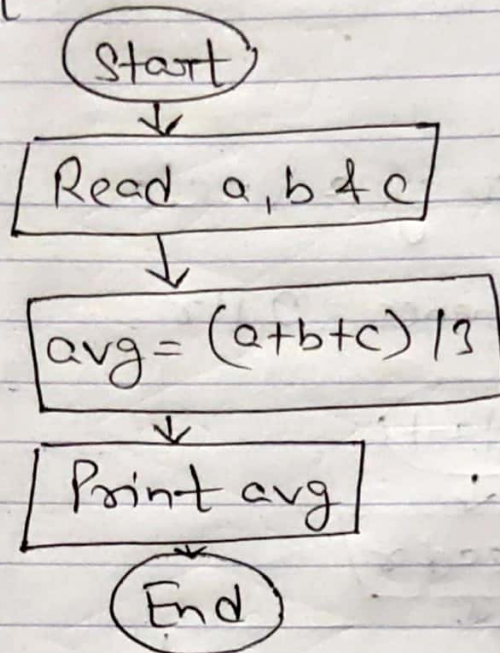


### ② Pseudocode

- ① Read  $r$
- ②  $Circ = 2 * \pi * r$
- ③ Print  $Circ$

### III. Average of 3 numbers

#### ① Flowchart



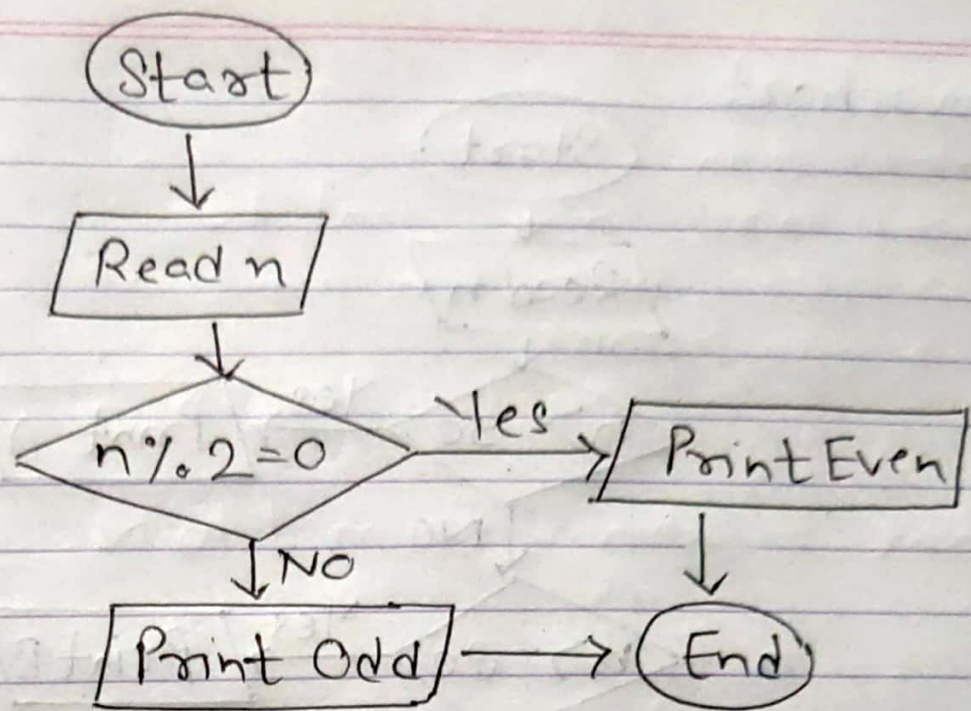
#### ② Pseudocode

→ Read a, b, c  
→  $avg = (a+b+c) / 3$   
→ Print avg

### IV. Check number is Even or Odd

#### ① Flowchart





## ② Pseudocode

- Read n.
- if  $n \% 2 = 0$ , then print even
- else print odd

## ▽. Students & Grade Flowchart

Marks      Grade

$\geq 90 \rightarrow A$

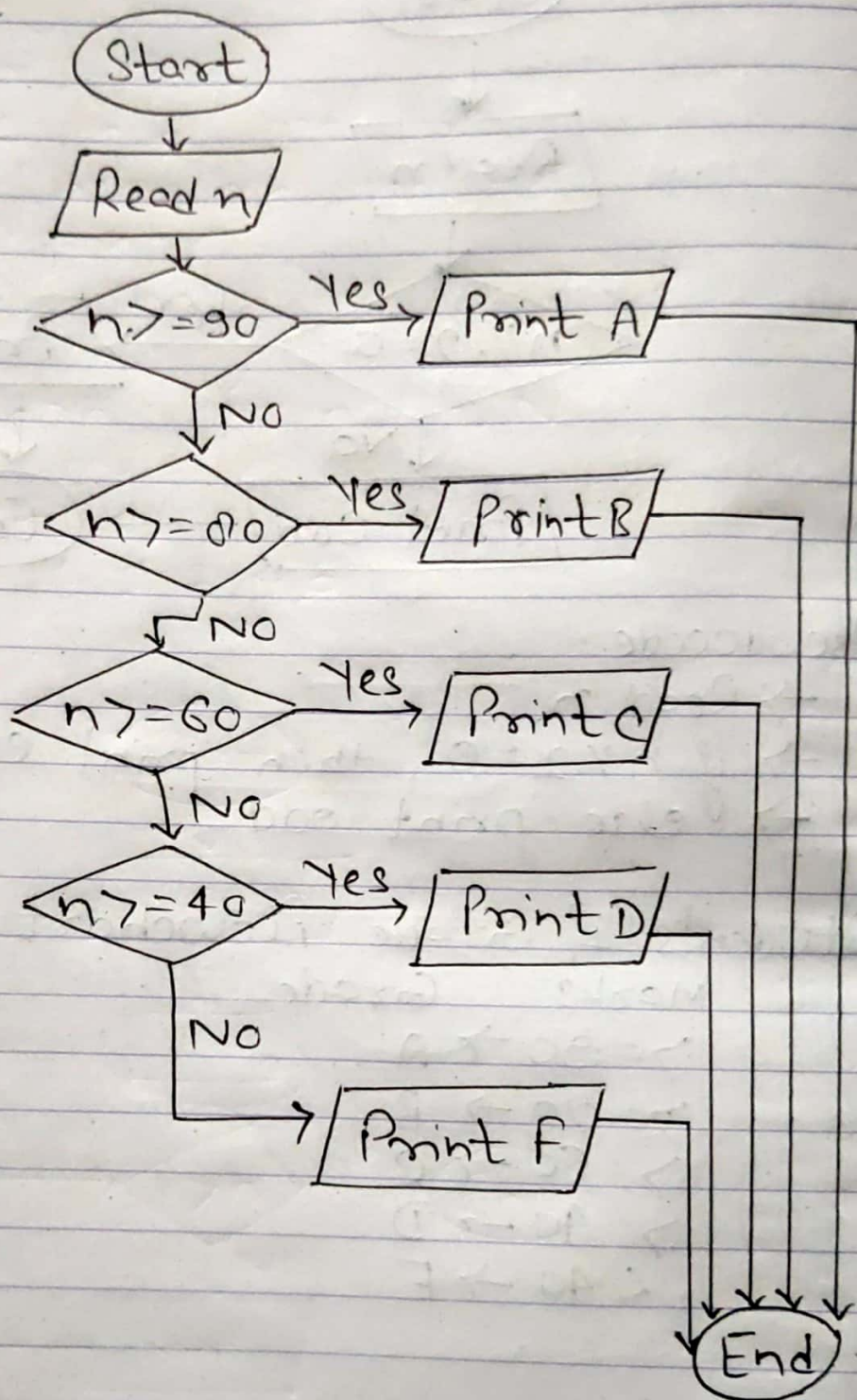
$\geq 80 \rightarrow B$

$\geq 60 \rightarrow C$

$\geq 40 \rightarrow D$

$< 40 \rightarrow F$

# ① Flowchart



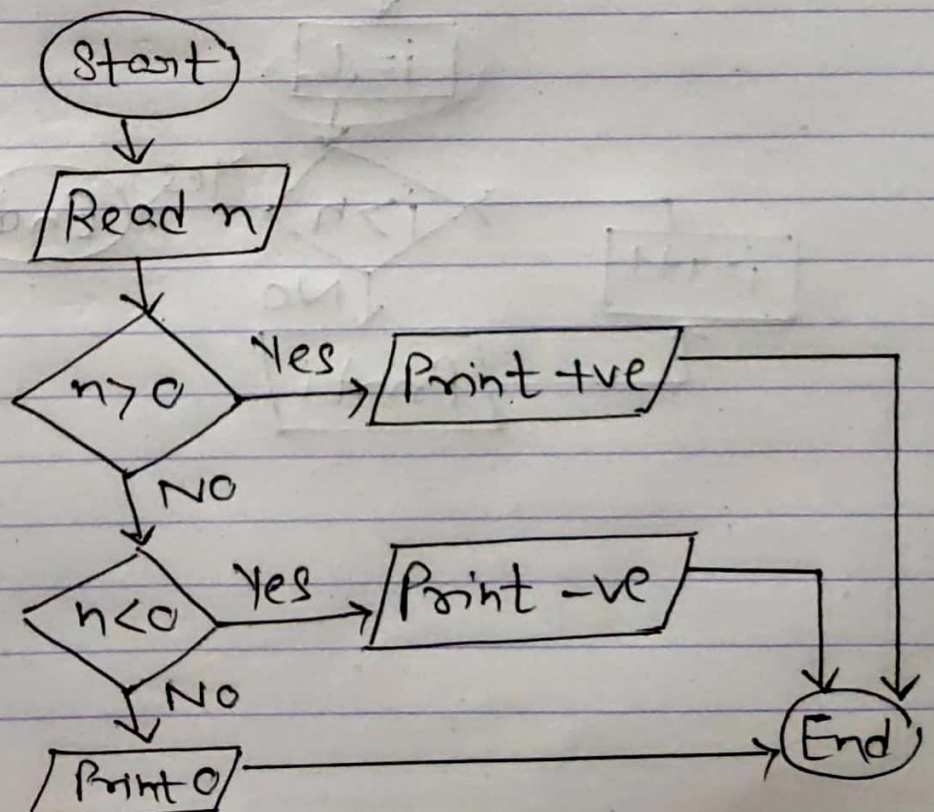


② Pseudocode:-

```
→ Read m
→ if  $m \geq 90$ 
    print A
→ else if  $m \geq 80$ 
    print B
→ else if  $m \geq 60$ 
    print C
→ else if  $m \geq 40$ 
    print D
→ else
    print F
```

VI. Check number is +ve, -ve or 0.

① Flowchart



## ② Pseudocode

→ Read  $n$

→ if  $n > 0$  then print +ve

→ else if  $n < 0$ , then print -ve

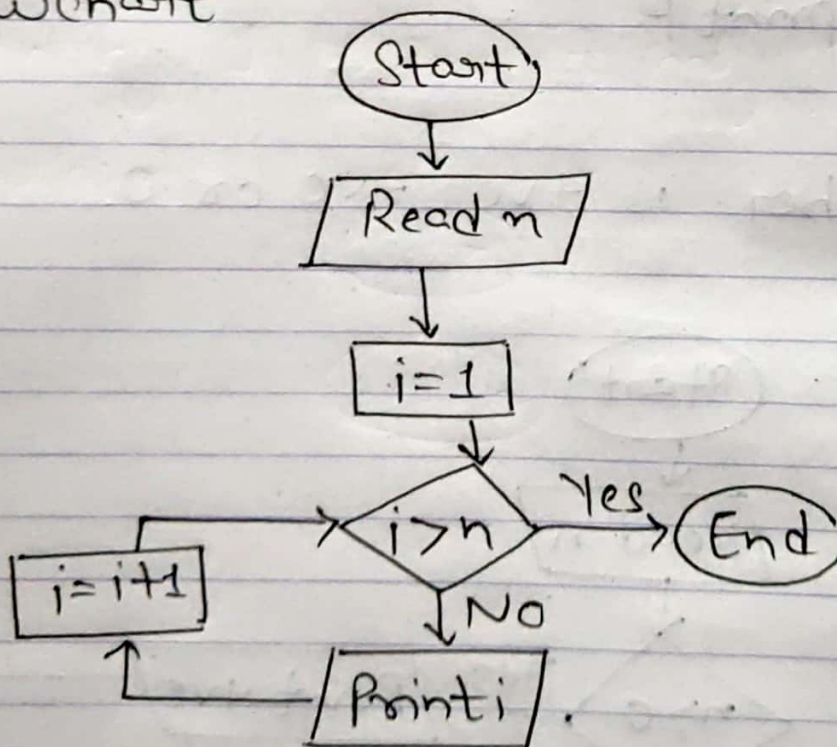
→ else print 0

## VII. Print counting from 1 to $N$ .

eg:-  $n = 5$

op = 1, 2, 3, 4, 5

## ① Flowchart





## ② Pseudocode

i)  $\rightarrow$  Read  $n$

ii)  $\rightarrow i = 1$

iii)  $\rightarrow$  if  $i > n$   
then exit

iv)  $\rightarrow$  else

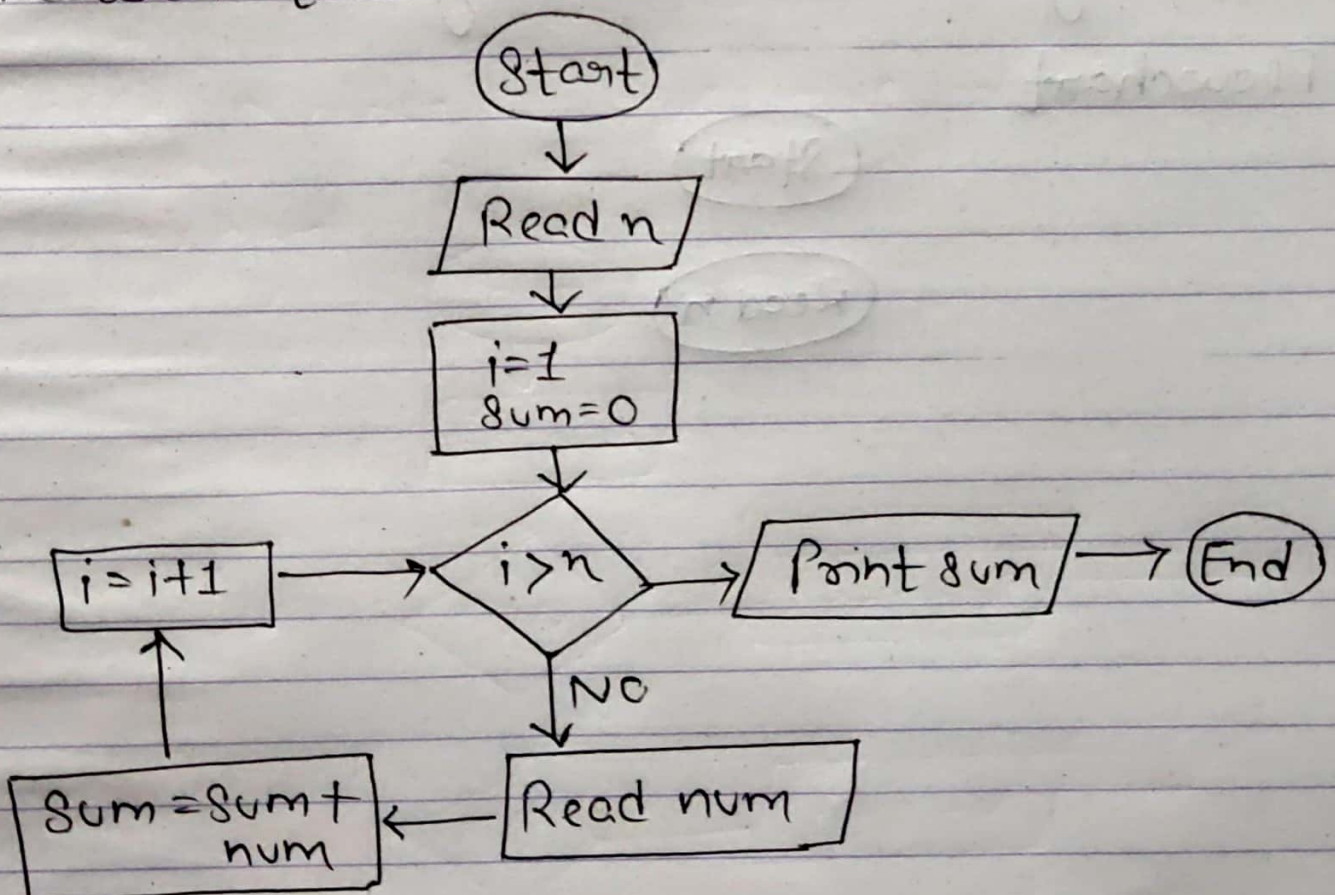
print  $i$

$i = i + 1$

go to step (iii)

## VIII. Add $N$ numbers from user.

### ① Flowchart



## ② Pseudocode

1) Read  $n$

2)  $i = 1$

3)  $sum = 0$

4) if  $i > n$   
then print sum & exit

5) else

read num

$sum = sum + num$

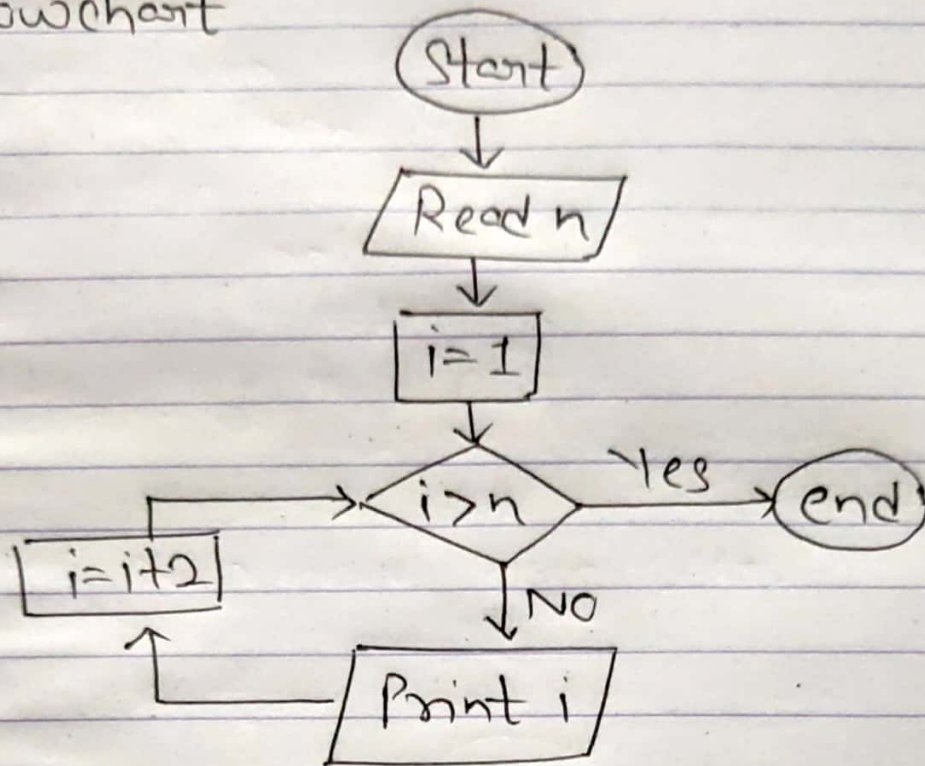
$i = i + 1$

go to step 4



## IX. Printing 1 to N but only Odd Numbers

### ①. Flowchart



### ② Pseudocode

- 1) Read n
- 2)  $i = 1$
- 3) if  $i > n$   
    then exit
- 4) else  
    print i  
     $i = i + 2$   
    go to step 3.