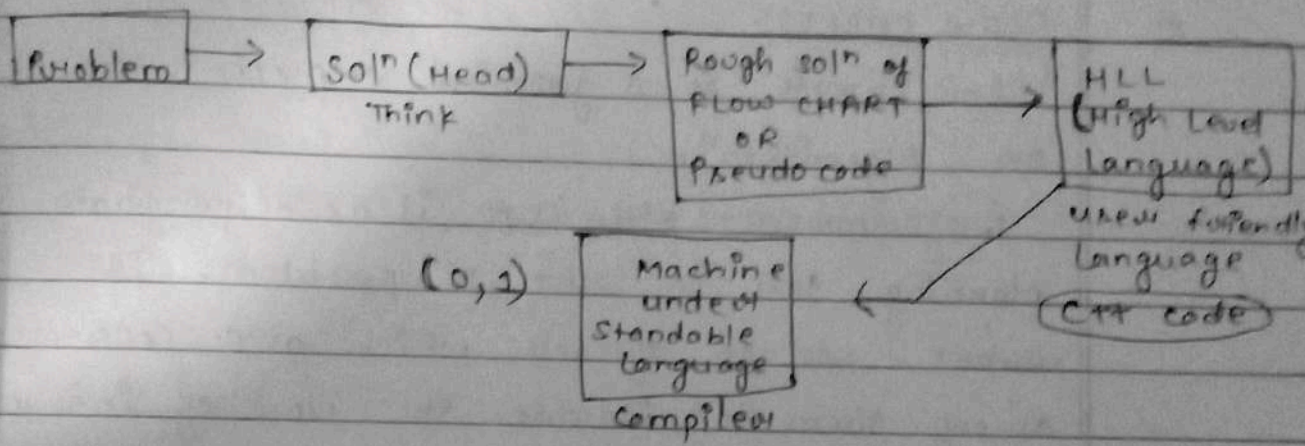
Lecture - 1

* Programming fundamentals :-

Q- How to solve a problem?

A → ① understand the problem
② Input values (check)
③ Approach (Logic Building)



Ex :- Print sum of two numbers?

Q-1- Diffⁿ b/w compiler & Interpreter?

ANS:- Compiler :- ① It take a program as a whole
② It generate intermediate machine code
③ It doesn't support Dynamic Typing.
④ The complied code run comparatively faster

Interpreter :- ① It take a single lines of code
② It never generate any intermediate machine code.
③ It support Dynamic Typing
④ The Interpreter code run comparatively slower.

→ Using Computer to solve a Problem.

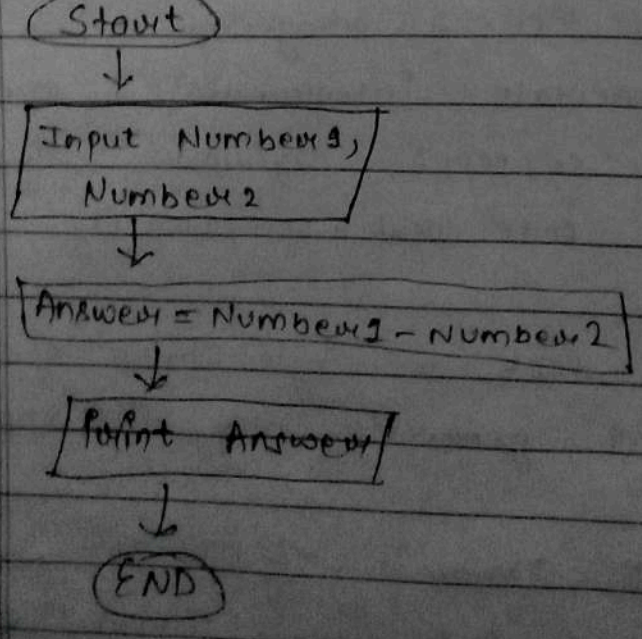
Computer does all difficult task in many times.

→ Main point you have to understand is "ALGORITHM"

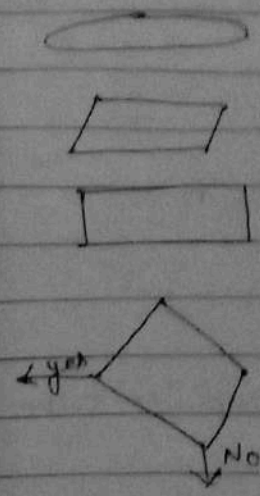
FLOW CHARTS:-

"Flow charts is a graphical representation of an Algorithm".

Programmers often use it as a program planning tool to solve a problem. It makes use of symbols which are connected among them to indicate the flow of information & processing. The process of drawing a flowcharts for an algorithm is known as "flow charting".



Component



Pseudoco

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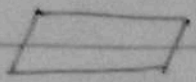
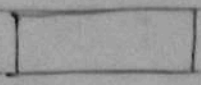
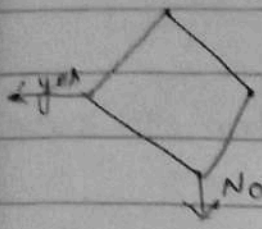
Component's of FLOW CHARTS:-

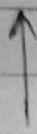
→ Terminator (Start / End)

 → Input / output Block

 → Process (Calculation) (Block)
or
Initialization



→ Decision Making Block (Condition)

 → Arrows (Flow of chart / Navigation)

→ Connectors (It show's function)

Pseudocode:- (Nakli Code) (It can understand by me but not computer)

" It is a generic way to represent your algorithm in textual form's. "

" Pseudcode has a multiple way to write diff^n approach of algorithm ".

Pseudocode is a detailed yet readable description of what a computer program or algorithm must do, expressed in a formally-styled natural language rather than in a programming language.

Pseudocode is sometimes used as a detailed step in the process of developing a program.

→ Example of Pseudocode

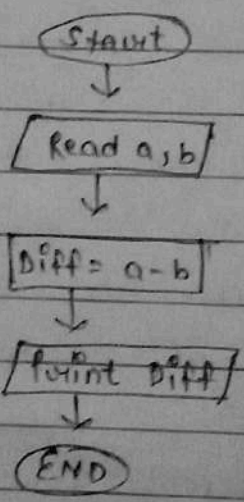
Start Program
Enter two numbers A, B
Add the numbers together
Print Sum
End Program.

Q- What is Algorithm?

Ans:- Algorithm is the approach of step to solve a problem.

Q- Write a flow chart, & pseudocode of difference a & b

A-



→ Read a, b
→ Diff = a - b
→ Print Diff

Q- WAP Pseudocode Multiplication of a & b

Ans:- ① Read a & b
② mult = a * b
③ print (mult)

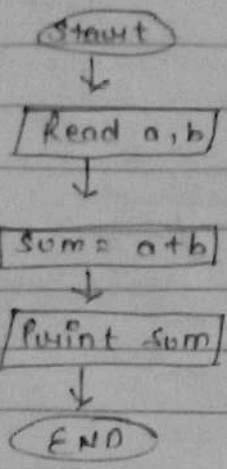
Q- Pseudocode of average of two no.

Ans:- ① Read a & b
② Avem = $\frac{a+b}{2}$
③ print avem

* Practice Questions

Q- Add two numbers by taking input

Ans:-



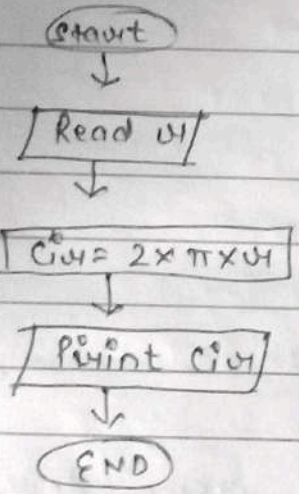
① Start
② Read a & b
③ sum = a+b
④ print sum
⑤ END

Solve

Q- Circumference of circle

b

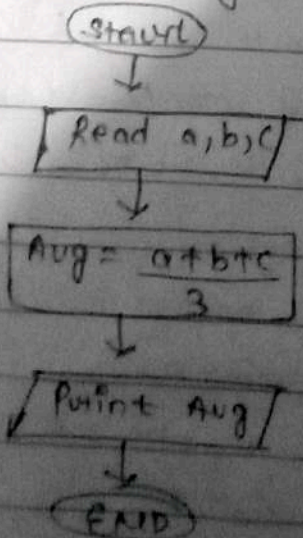
Ans:-



① Start
② Read R
③ Circ = 2 × π × R
④ Print R
⑤ END

Q- Average of three no.

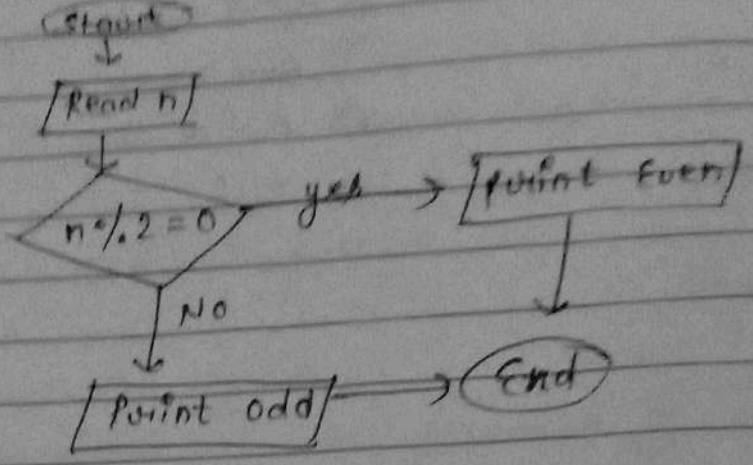
Ans:-



① Start
② Read a,b,c
③ Avg = $\frac{a+b+c}{3}$
④ Print Avg
⑤ END

Q. check number is odd or even?

Ans/



(1) Start

(2) Read n

(3) if n%.2 = 0
then print even

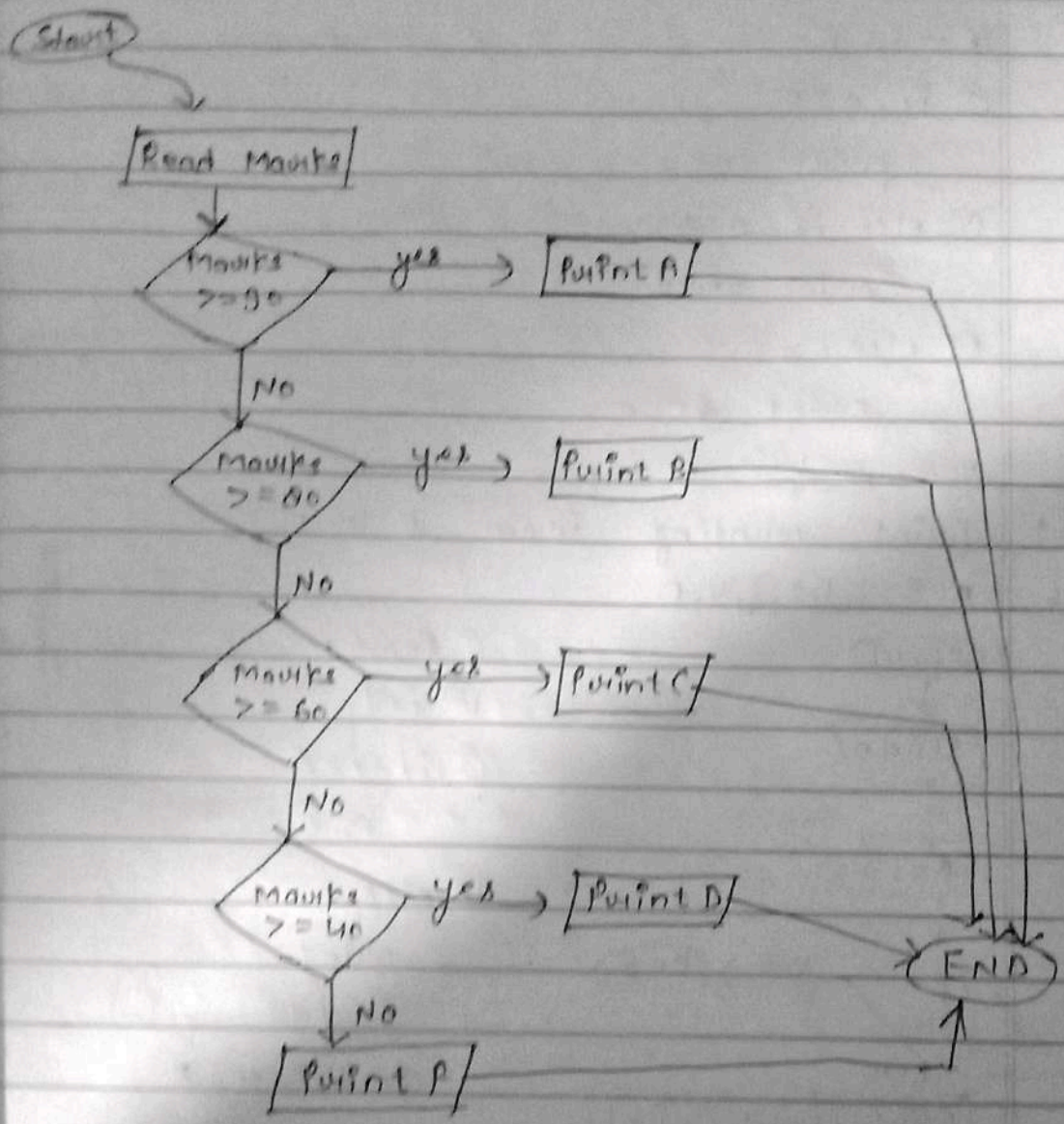
(4) else
then print odd

Note :- % (Modulo) :- It gives an remainder when two no. is dividing each other. No

Q- Student & Grade

if >= 90 → A
>= 80 → B
>= 60 → C
>= 40 → D
< 40 → F

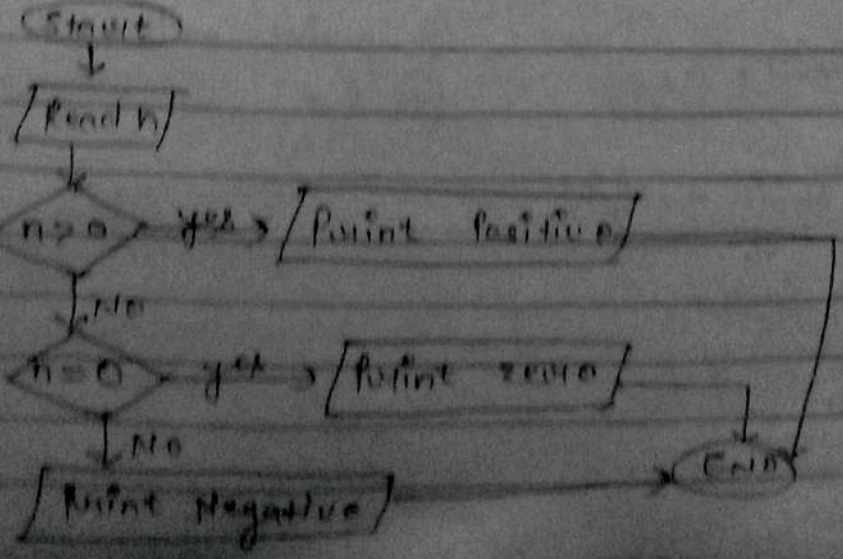
(1) Start
(2) Read marks
(3) if marks >= 90
print A
elseif marks >= 80
print B
elseif marks >= 60
print C
elseif marks >= 40
print D
else print F



Note :- If is face any issue in code & flow chart do "Dry Run" it.

Q- check number is +ve, -ve or zero.

Ans)

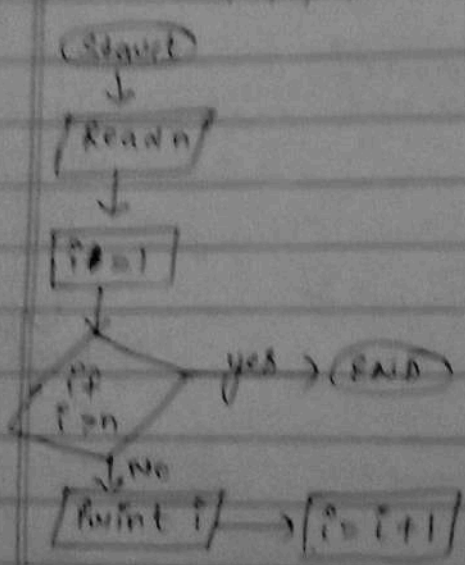


① Read n
② If n > 0
print true
③ else if n = 0
print zero
④ else
print -ve

Homework:

Q-1 Print counting from 1 to N?

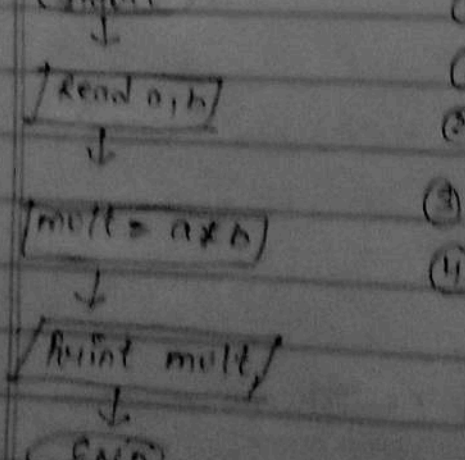
Ans: n = 5 1, 2, 3, 4, 5



① Read n
② i = 1
③ if i > n
End
④ else
print i
i = i + 1
Go to step 3

Q-2 Multiply 2 no. by taking input?

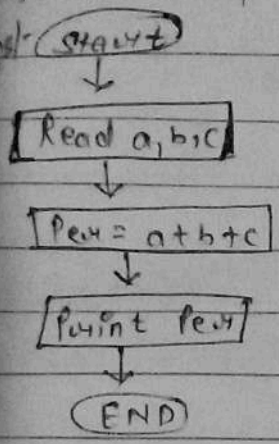
Ans:



① Start
② Read a & b
③ mult = a * b
④ print mult
⑤ End

Q-3- Find perimeter of a Triangle?

Ans/-



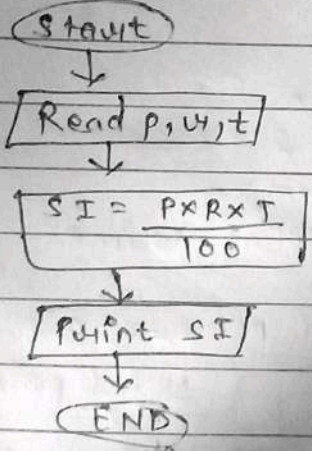
① Read a,b,c

② Peri = a+b+c

③ print peri

Q-4 Find Simple Interest?

Ans/-



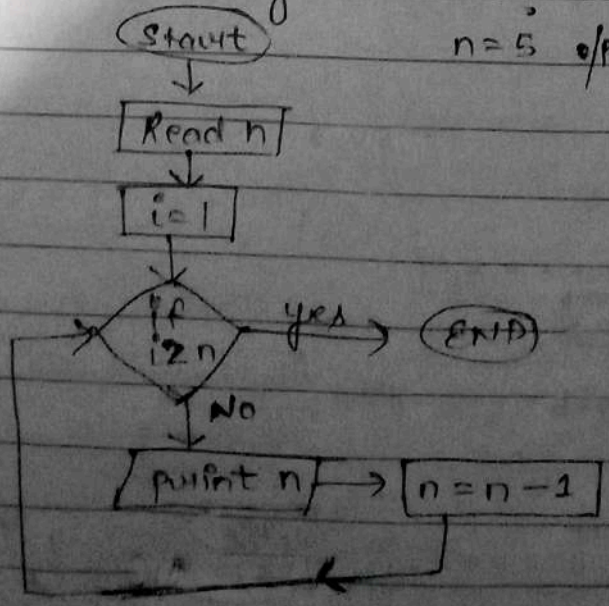
① Read p,r,t

② $SI = \frac{P \times R \times T}{100}$

③ Print SI

Q-5 Print counting N to 1?

Ans/-



n=5 o/p 5, 4, 3, 2, 1

① Read n

② i=1

③ if i≥n

End

④ else

print n

n = n-1

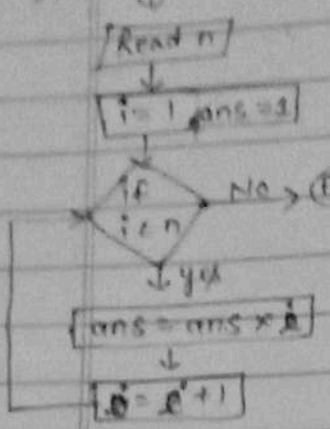
Go to step 3

Must Remember :-

∴ Looping :- ① Initialize
② Condition
③ Process
④ Increment

Q-6 Find Factorial of a number?

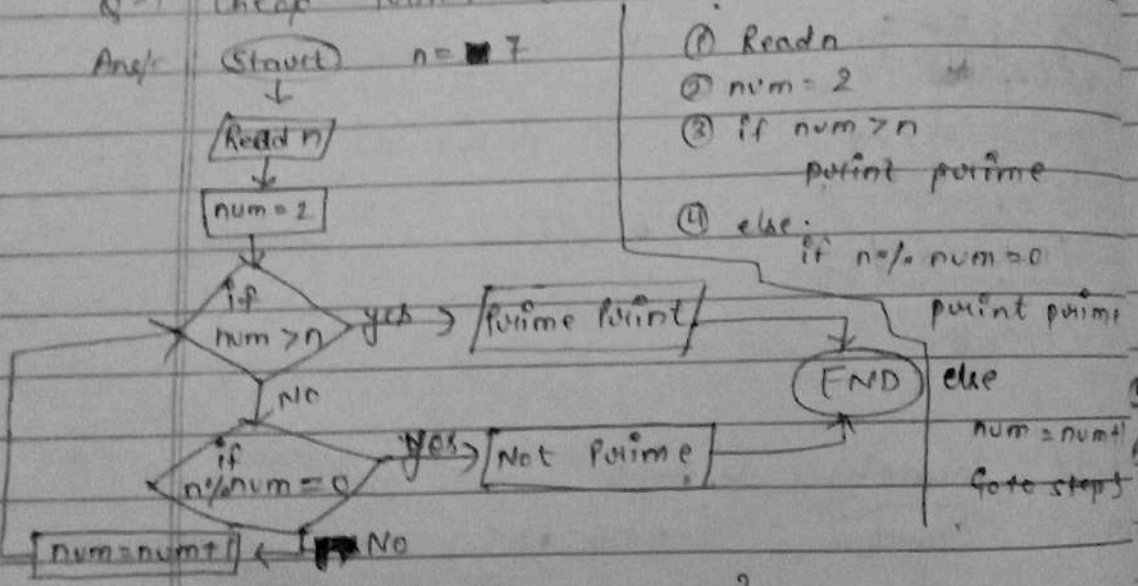
Ans/- n = 5 o/p = 5×4×3×2×1
= 1×2×3×4×5 = 120



① Read n
② i = 1, ans = 1
③ if i <= n
ans = ans * i
i = i + 1
④ else
end;

Q-7 Check prime or not?

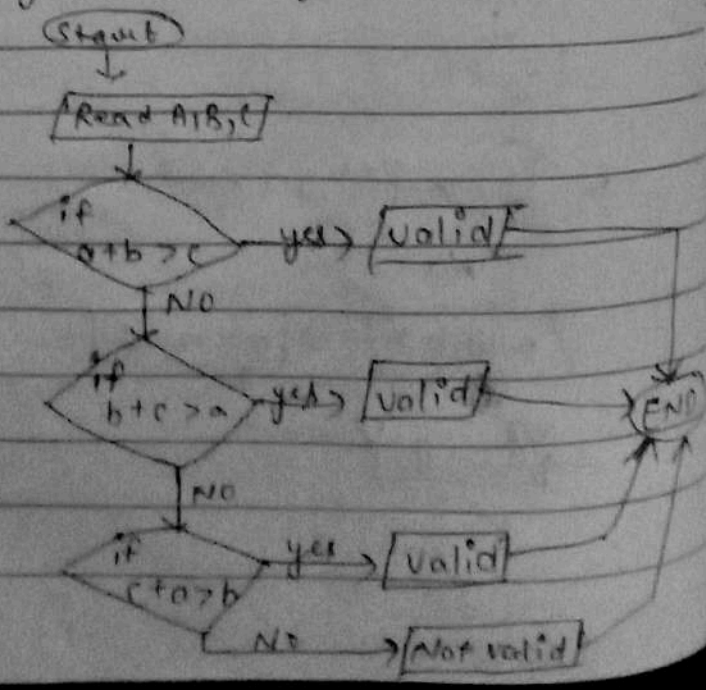
Ans/-



① Read n
② num = 2
③ if num > n
print prime
④ else:
if n%num = 0
print prime
else
num = num + 1
Goto step 3

Q-8 Valid Triangle or not?

Ans/- A + B > C
B + C > A
C + A > B



① Read A, B, C
② if a+b > c
print valid
③ else if b+c > a
print valid
④ else if c+a > b
print valid
⑤ else
not valid

6 END

Q-9- Printing 1 to N but only even numbers?

Ans:- Start → Read n → if e2 → if i>n → yes → END; No → Print i → i=i+2 (back to if i>n)

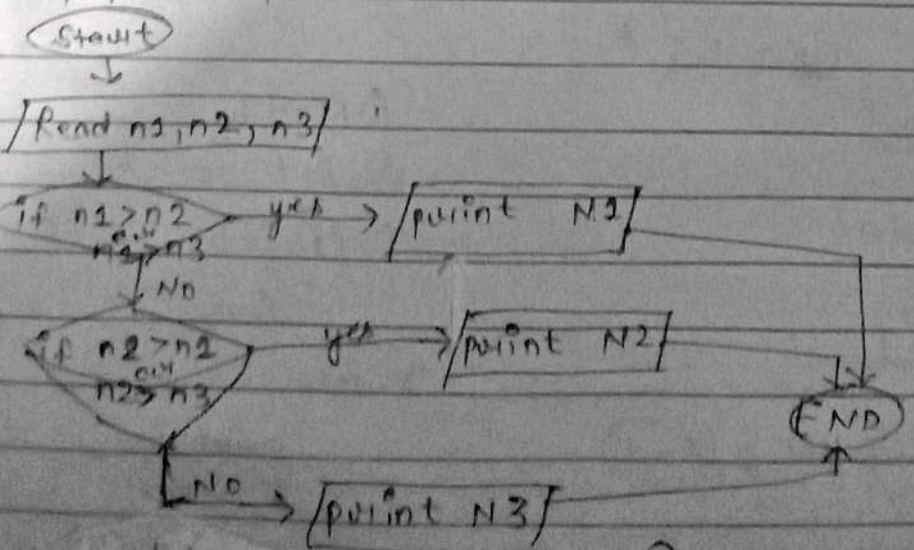
n=6 1,2,3,4,5,6

o/p- 2,4,6

① Read n
② i=2
③ if i>n
End
④ else
print i
i=i+2
goto step 3

Q-10- Print max of three numbers?

Ans:- 2,4,8 o/p- 8



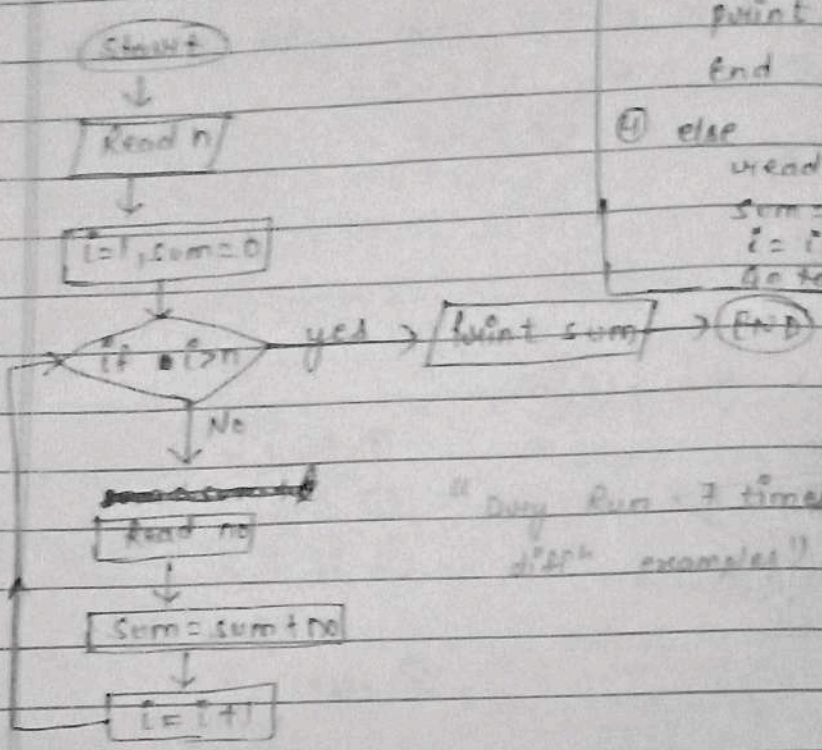
① Read n1, n2, n3
② if n1>n2 || n1>n3
print n1
③ else if n2>n1 || n2>n3
print n2
④ else
print N3

* Dry Run flow verification

Q-11- Add N numbers from user?

Ans:- n=3

1st → 1
2nd → 2
3rd → 6
} sum = 13

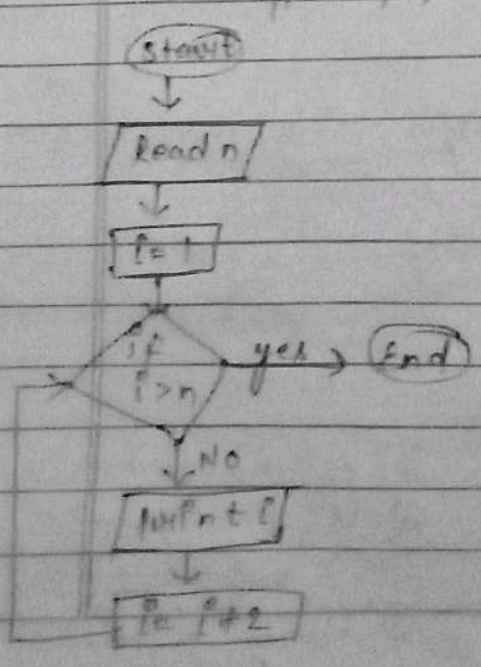


"Dry Run - 7 times with diff^t examples"

Q-12- Printing 1 to N only odd num?

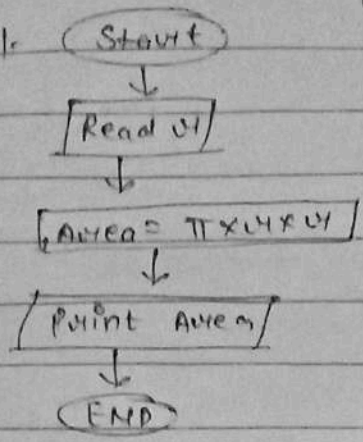
Ans:- n=6 1,2,3,4,5,6

o/p - 1,3,5



Q-13. Find Area of circle?

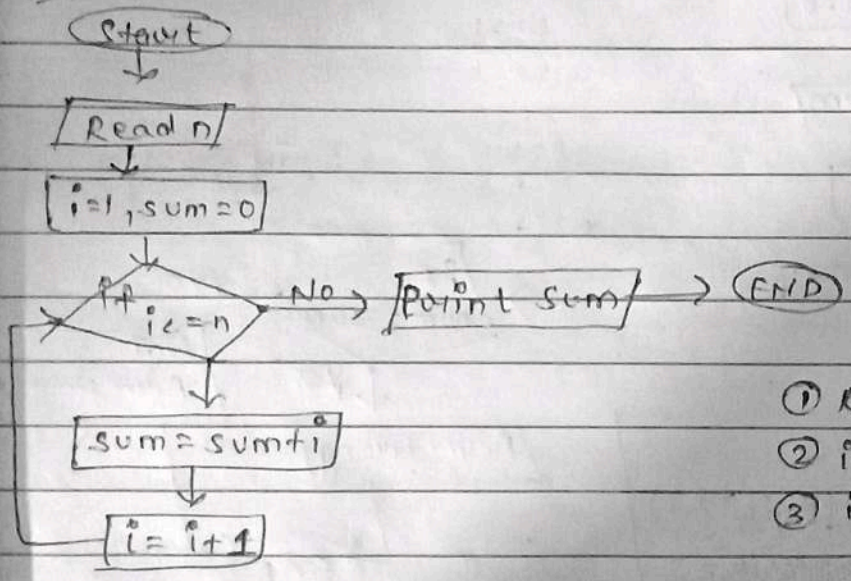
Ans:-



① Read r
② Area = π×r×r
③ print Area

Q-14- Find sum of n numbers?

Ans:- n = 5 o/p = 1+2+3+4+5 = 15

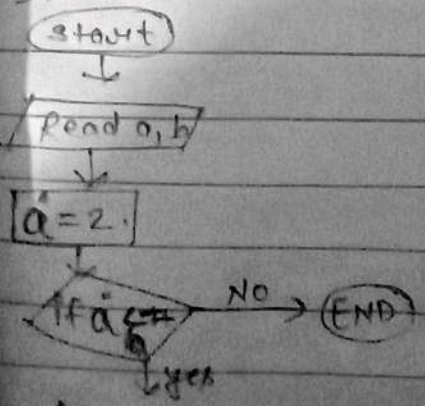


① Read n
② i=1, sum=0
③ if i<=n
print sum
END
④ else
sum = sum+i
i = i+1

Doubt

Q-15- Print all prime in b/w [a, b]? Go to step 3

Ans:- a = 2 b = 10 o/p → 2, 3, 5, 7



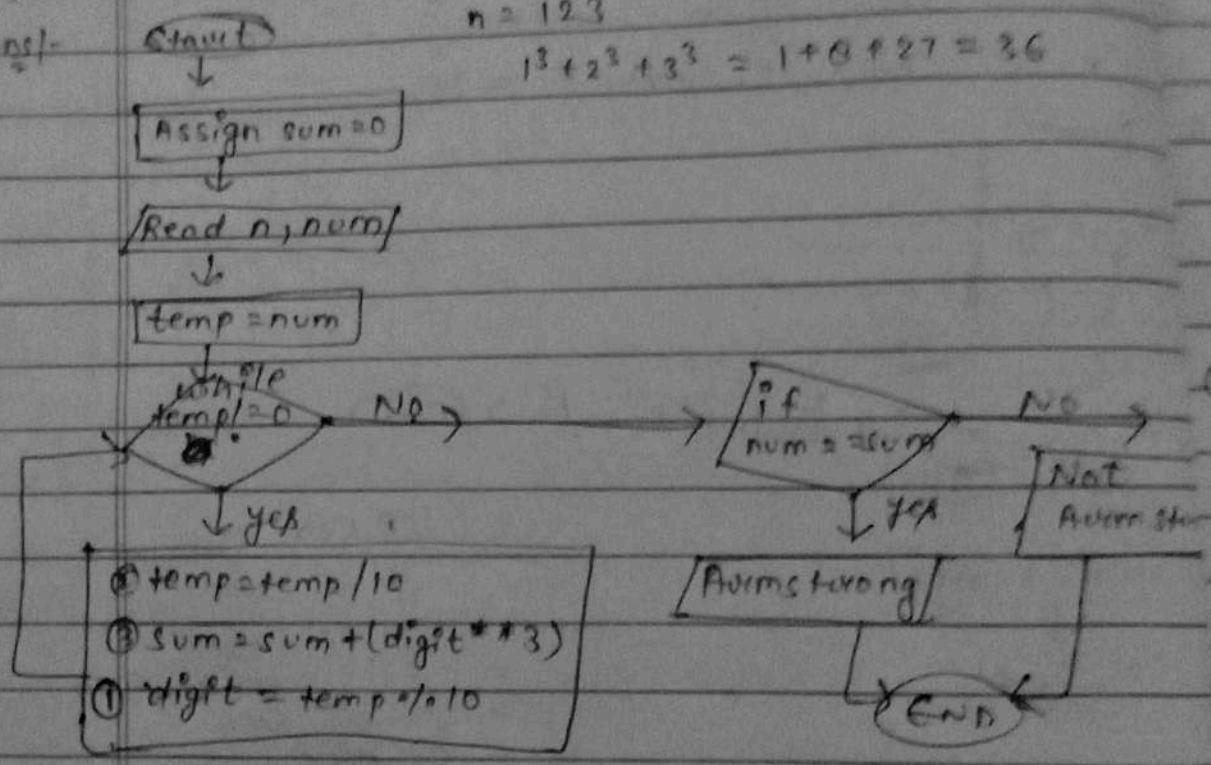
if

* Duty

Q-16- Is number is armstrong or not?

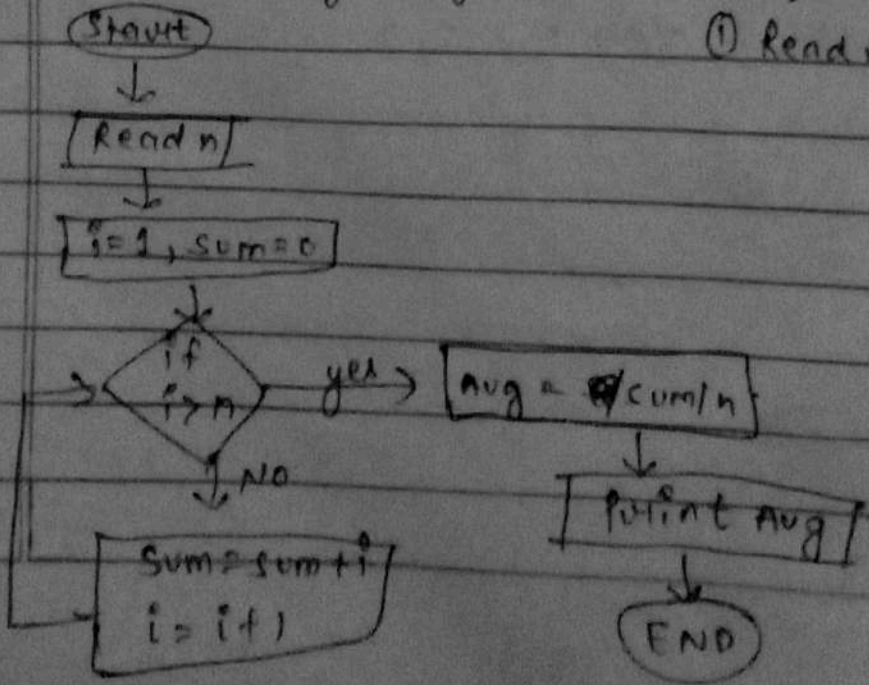
Ans/- $n = 123$

$1^3 + 2^3 + 3^3 = 1 + 8 + 27 = 36$



Q-17- Find average of n numbers?

Ans/- ① Read n

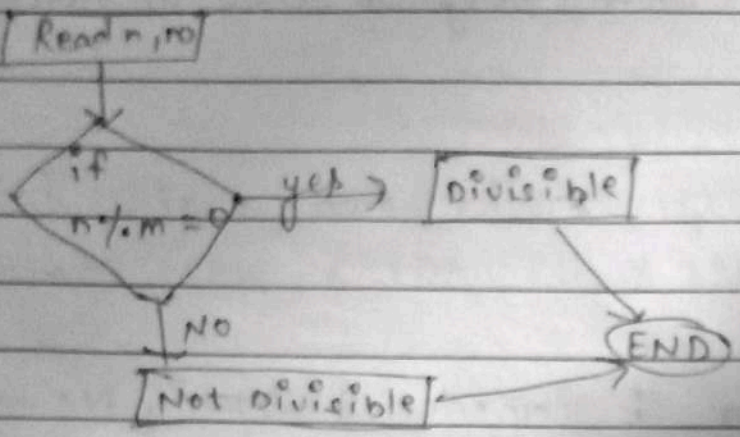


Note * upload on Github

① Read n
② i=1, sum=0
③ if i>n
Avg = sum/n
print Avg
END
④ else
sum = sum + i
i = i+1
Goto step 3

Q-18- If number (n) is divisible by m?

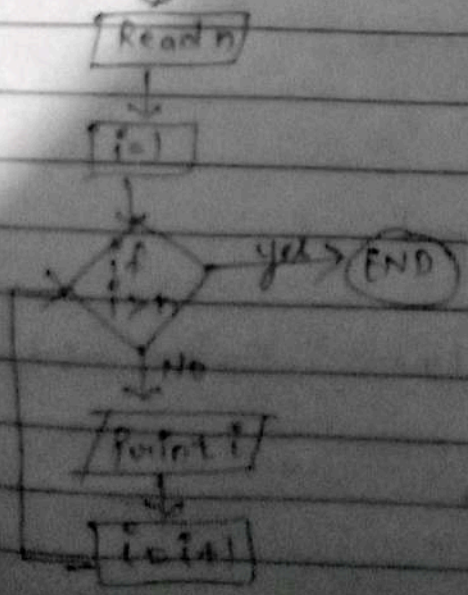
Ans/- Start n=4 m=2



① Read n, m
② if n%m==0
print Divisible
③ else
Not Divisible

Q-19- Print all digit of a (n) number?

Ans/- Start n=7 o/p- 1, 2, 3, 4, 5, 6, 7



① Read n
② if i>n
End
③ else
print i
i = i+1
Go to step(2)