

## \* Basics of programming:- Lecture 1: Flowcharts :-

### \* Intro to Flowcharts

1) Analysis your problems



2) Break down problem into smaller sub parts



3) Write down solution on paper



4) Verify your solution

5) Write code

What is A Flowchart?

- Diagrammatic representation illustrating a solution to a given problem

- Allows you to break down any process into smaller steps and display them in a visually pleasing way.

## Flowchart Components

(start)

Terminator

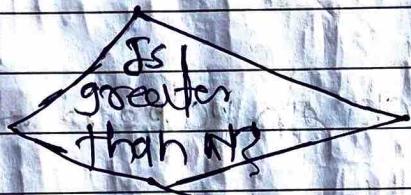


Read (N)

Input/Output

[Letsum=0, i=1]

process



decision



(A)

connection

Ex:-

① Add two numbers :-

[start]



Read A,B



[sum = A+B]



Output sum



(End)

classmate

② Read principal , Rate and Time and point SI.

start



Read P,R,T

~~P~~ ~~100~~ ~~4~~ ~~2~~  
P R T



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

$$SI = 80$$

point SI



End

③ Average of 3 numbers :- (H.W)

You are given three numbers. You need to calculate and point their average value . Draw a flowchart for this process.

(start)

Read A,B,C



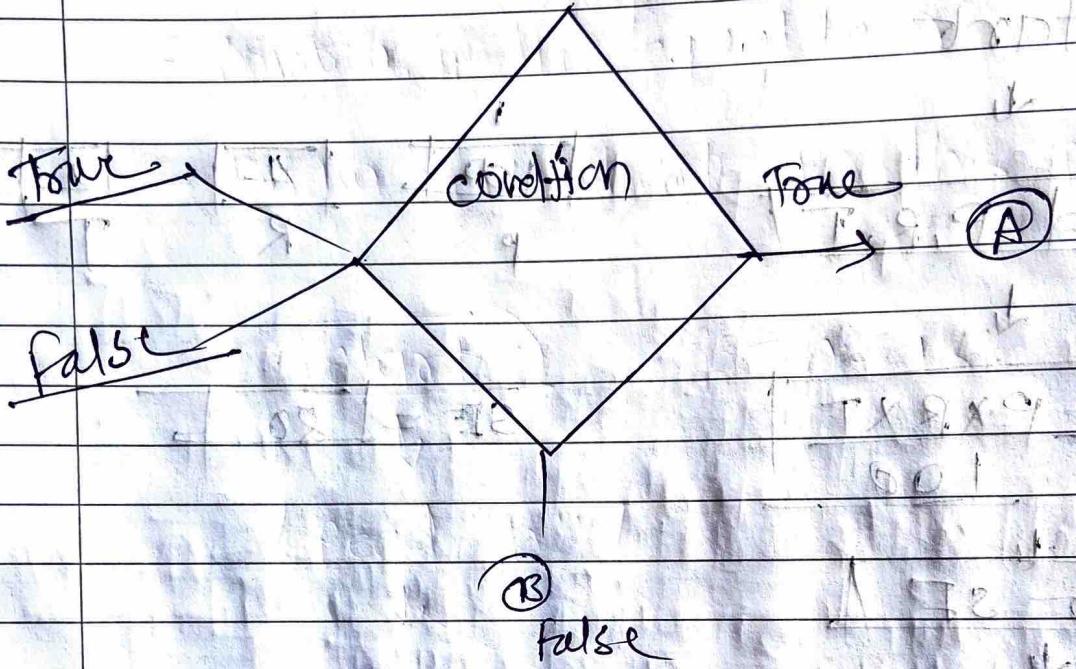
$$D = \frac{A + B + C}{3}$$

$$D = 7.66$$



classmate point D

End

Decision Box :-

① check whether number is odd or even

(start)

Read A

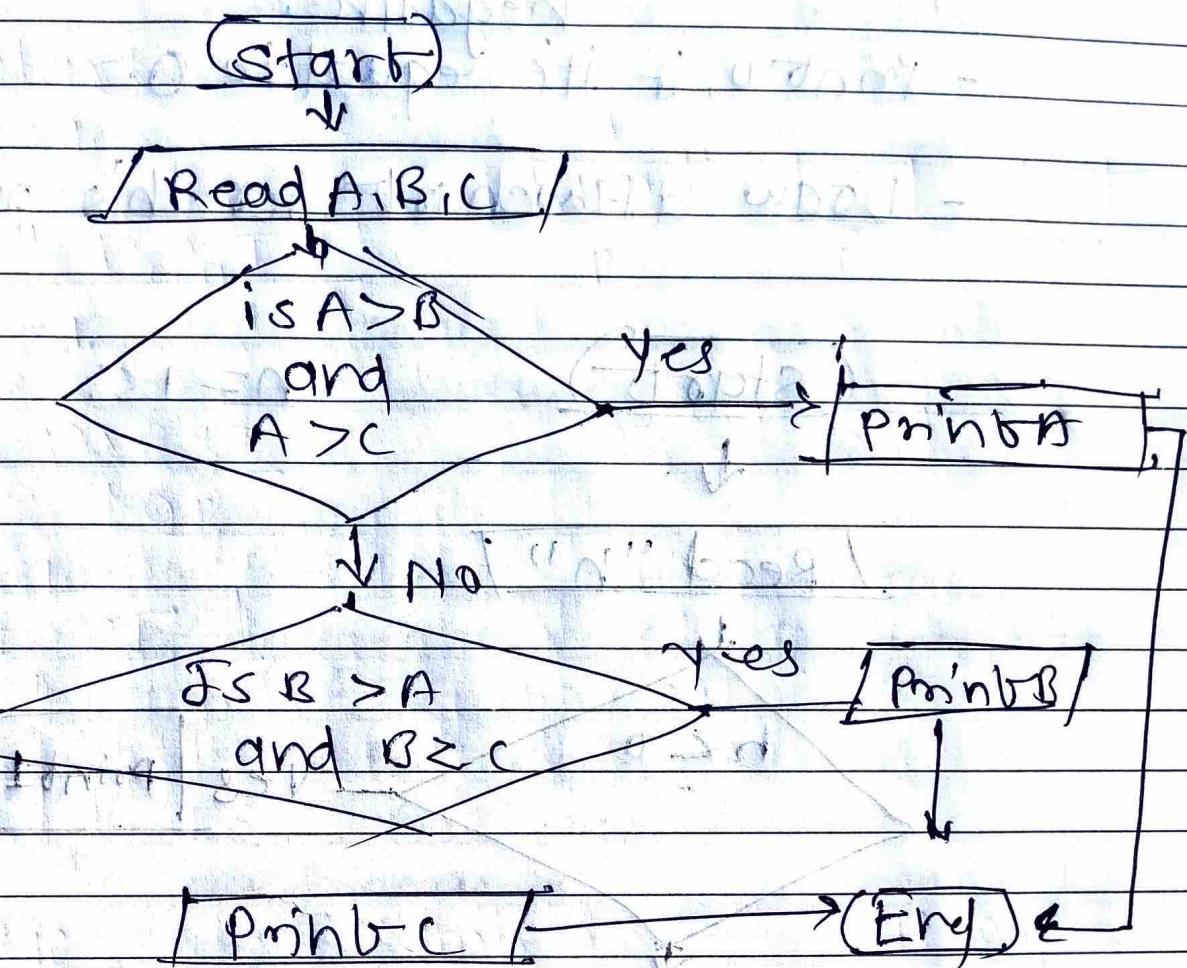
$$A \% 2 == 0$$

point ("Even")

print "odd"

classmate End

② Find Largest of Three numbers:-



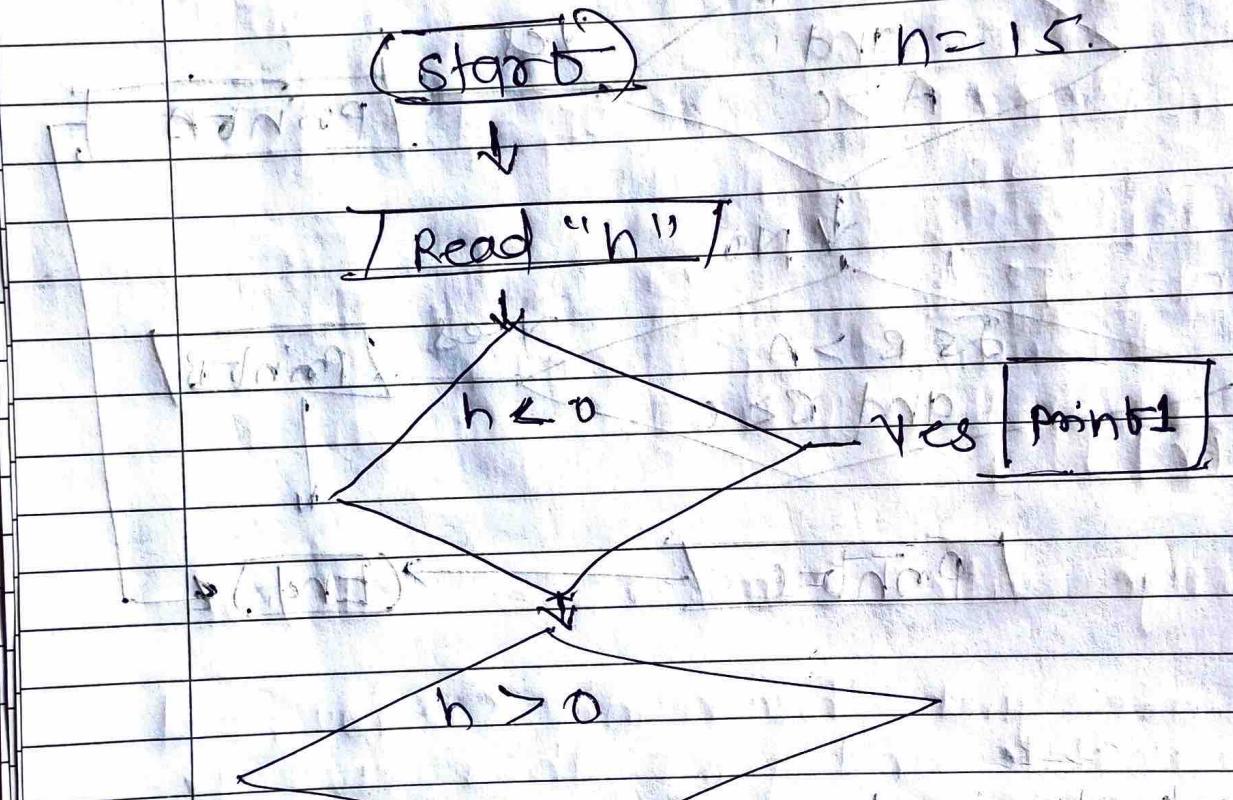
Q. 3

③ check Number:-

you are given a single number. you need to print one of the following statements output according to the number nature ..

- print + if the number is positive
- print - if the it is negative.
- print 0, if its equal to 0.

- Draw a flowchart for this process



## (Q) Valid Triangle :-

You are given 3 numbers? Each number represents the length of a line. You need to figure out whether these lines can form a valid triangle.

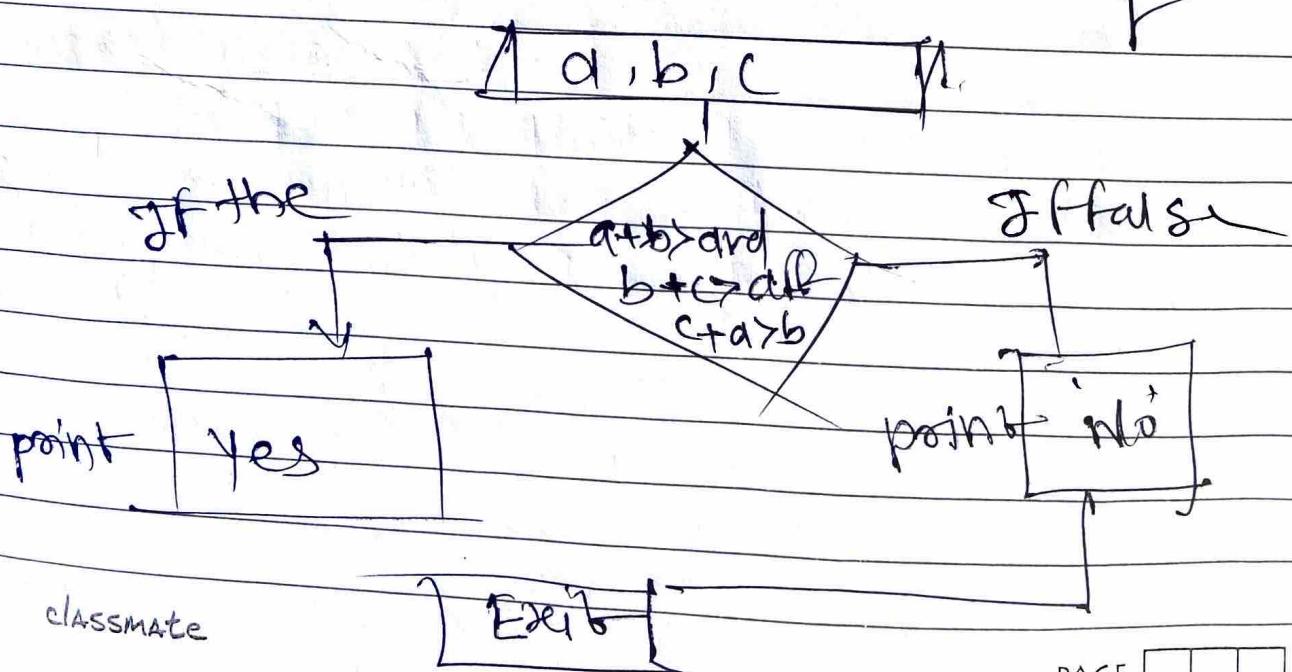
If a valid triangle can be formed, point "yes", otherwise point "No".

Draw a flowchart for this process.

A Triangle is a valid triangle if and only if, the sum of any two sides of a triangle is greater than the third side. For example, let A, B and C be the three sides of a triangle then  $A+B > C$ ,  $B+C > A$  and  $C+A > B$ .

Ans:-

Step - deliver three variety



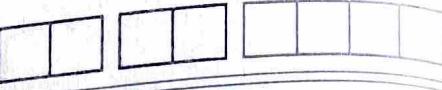
## Notes :-

### Handouts

### Introduction :-

Here are the steps that may be followed to solve an algorithmic problem.

- I) Analysing the problem statement means making the objective of the program clear in our minds like what is the required output.
- II) sometimes the problems are of complex nature, to make them easier to understand, we can break-down the program (problem) into smaller sub-parts.
- III) In order to save our time in debugging our code, we should first of all write down the solution on a paper with basic steps that would help us get a clear intuition of what we are going to do the with the problem statement.
- IV) In order to make the solution error-free the next step is to verify the solution by checking it with a bunch of test cases.



v) Now, we clearly know what we are going to do in the code. In this step we will start coding our solution on the computer.

Basically in order to structure our solution, we use Flowcharts. A flowchart would be a diagrammatic representation of our algorithm, a step approach to solve our problem.

Flowcharts :-

Uses of Flowcharts -

- used in documentation.
- used to communicate one's solution with other's, basically used for group projects.
- To check out at any step what we are going to do what and get a clear explanations of the flow of statements.

## Flowcharts components :-

- Terminators

start

mainly used to denote the start point of the program.

End

used to denote the end point of the programme.

- Input/output

Read 'Var' / used for taking input from the user and store in variable 'Var'.

Print 'Var'

used to output value stored in variable 'Var'.

- Process

Sum(2,3)

used to perform the operation(s) in the program for ex:-

sum(2,3) just performs arithmetic summation of the numbers 2 and 3.

- Decision



used to make decision(s) in the program means it depends on some condition and answers in the form of TRUE (yes) and FALSE (for no).

- Arrows



Generally used to show the flow of the program from one step to another. The heads of the arrows shows the next step and the tail shows the previous one.

- Connector



Used to connect different parts of the programme and are used in case of break-through. Generally used for functions which we will study in our further sections.

## Summary :-

- Flowcharts are the building blocks of any problem (program) written in any language.

- Different shapes used to have different meanings.
- Every problem can be represented in the form of a flow chart.
- Sometimes, it becomes a bulky process to represent any program using flowcharts. In those cases, try to find out the optimal solution to the given problem.