Problem Solving Techniques(Part-2)

(Algorithms, Flowcharts and Pseudocodes)

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Algorithm

- An algorithm is a step-by-step procedure for solving a computational problem. It is a process or set of rules to be followed in calculations or other problem-solving operations.
- It is a set of instructions that take input(data) and produce output(result) in finite no of steps.
- We can write an algorithm using natural language.
- Characteristics:

  1.definiteness

  2.input

  3.output

  4.finiteness

  5.language independent

Algorithm to find addition of 2 numbers

Step 1:Start

Step 2:Declare num1,num2 and sum variables.(A;B;Sum)

Step 3:Determine the values for num1 and num2.(A=2;B=4)

Step 4:Add num1 and num2 together and save the result in sum variable.(Sum=A+B)

Step 5:Display the result(A+B=6 or Sum=6)

Step 6:Stop

Flowchart

- A flowchart is used for showing the flow of control in a program and the sequence of steps involved in a hierarchical manner. It is basically a diagrammatic representation of an algorithm.
- If a program is very big then it is very difficult to figure out how the flow of the program is, Flow charts are useful for understanding the program, instead of one is reading the program and understanding it, he can see the flow chart and understand how the program is working.
- Visual Representation
- Easy to Understand
- Problem Solving

Elements that are used in flowcharts:

1.Terminal: The oval symbol indicates start and end of the program.The terminal is the first and last symbol in the flowchart.

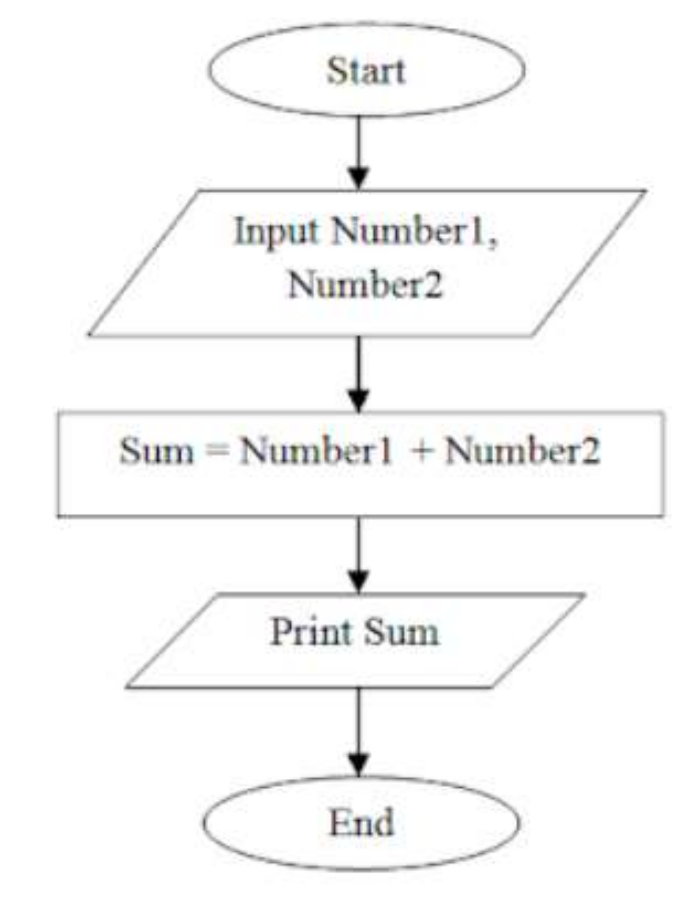
2.Input/Output:A parallelogram symbol shows where data enters or leaves the process.

3.Processing:A rectangle Symbol indicates specific action or operation.

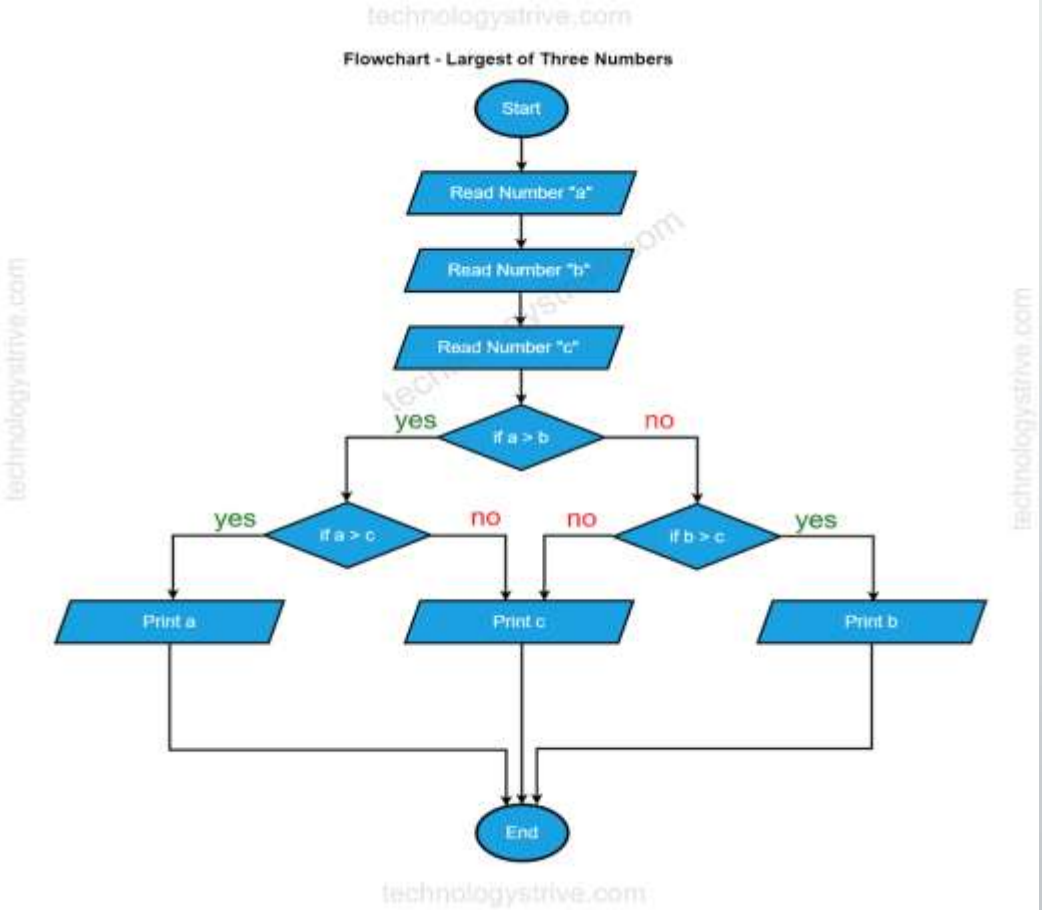
4.Decision:A diamond Shape indicates a conditional operation(yes/no or true/false).

5.Flow lines: Arrows show the direction of process flow.

1.Flow chart of addition 2 numbers



2.Flowchart of finding largest num among 3 nums



Pseudocode

- A way to describe an algorithm's logic in more detail, without worrying about specific programming language syntax.It uses structured English to describe the logic of the algorithm.
- **Example :**

```
Start
  input a,b
  sum=a+b
  print sum
End
```