

Basic Concepts of Algorithm and Flowchart

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Stream : MCA

Semester : Semester 1st

Subject : Programming Concept with Python

Subject Code : MCAN-101

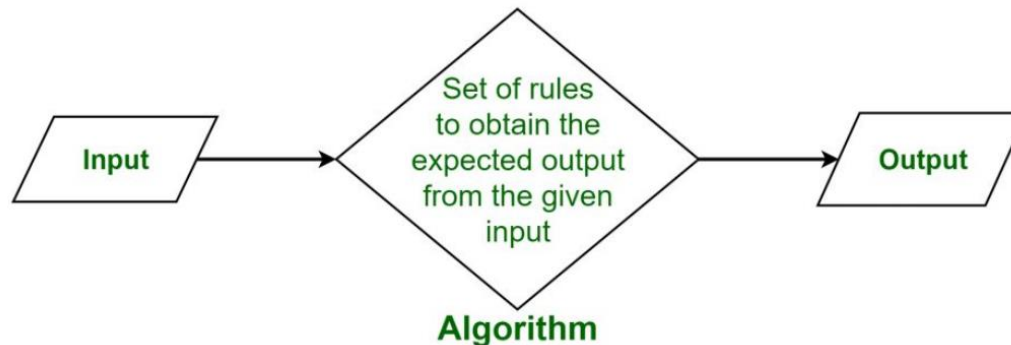
What is an Algorithm?

An **Algorithm** is a well-defined, step-by-step set of instructions or procedures designed to perform a specific task or solve a particular problem. Algorithms are foundational in computer science and mathematics but can be applied in various fields to process data, automate decision-making, and optimize processes.

Key Characteristics of an Algorithm:

1. **Finiteness:** It must terminate after a finite number of steps.
2. **Definiteness:** Each step must be clear and unambiguous.
3. **Input:** It may require zero or more inputs to operate.
4. **Output:** It should produce at least one output or result.
5. **Effectiveness:** Each step should be basic enough to be executed in a finite amount of time.

What is Algorithm?



What is a Flowchart?

A **Flowchart** is a graphical representation of a process or algorithm, using symbols and arrows to depict the sequence of steps or actions required to solve a problem or complete a task. Flowcharts are widely used in various fields, including computer science, business, and engineering, to visualize workflows, algorithms, and decision-making processes.

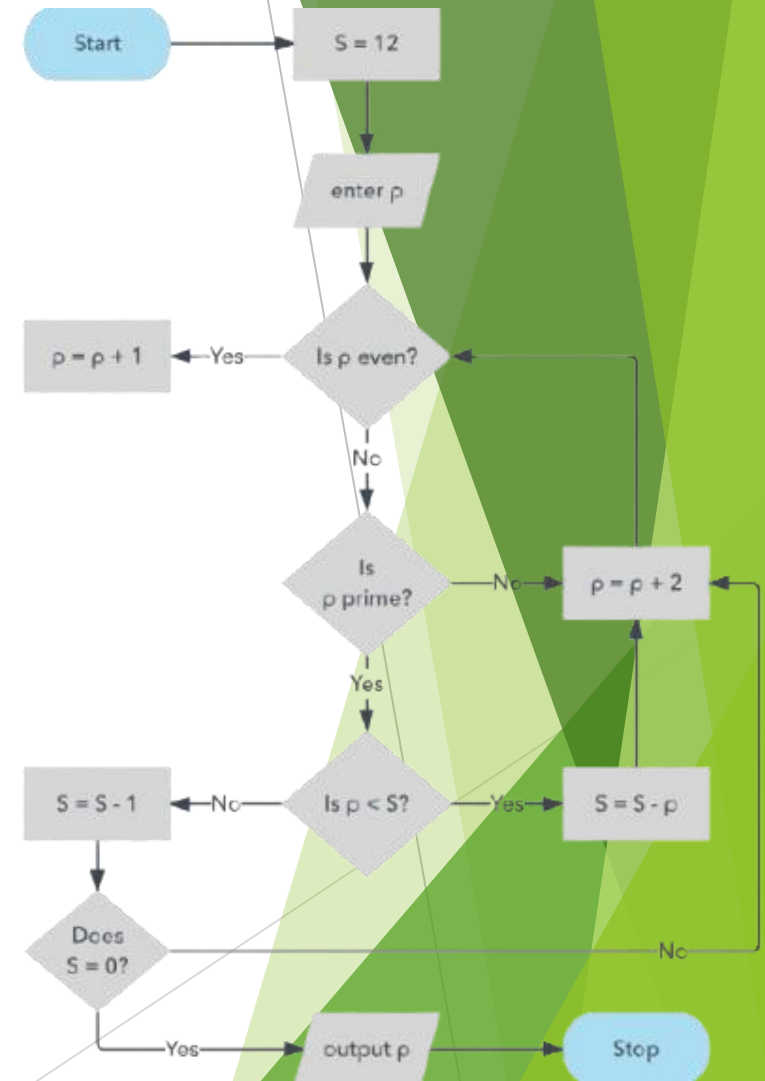
Key Elements of a Flowchart:

1. **Symbols:** Standard shapes represent different types of actions or steps:

1. **Oval:** Start or end of a process.
2. **Rectangle:** Process or operation.
3. **Diamond:** Decision point.
4. **Arrow:** Direction or flow of steps.

2. **Flow Lines:** Arrows connect the symbols, indicating the flow or sequence.

3. **Labels:** Descriptive text inside symbols provides clarity about the steps.



Properties of Algorithm

1. Finiteness

- The algorithm must always terminate after a finite number of steps.
- This ensures the process does not run indefinitely and produces a result within a reasonable amount of time.

2. Definiteness

- Each step in the algorithm must be clear, precise, and unambiguous.

3. Input

- An algorithm can accept zero or more inputs to operate.
- These inputs are provided to the algorithm before it begins or during its execution.

4. Output

- An algorithm must produce at least one output or result.
- The output is the solution or final state after processing the input.

5. Effectiveness

- Each operation in the algorithm must be simple enough to be performed within a finite amount of time and with finite resources.

6. Generality

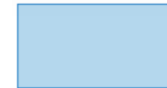
- An algorithm should be general enough to solve a class of problems, not just a specific instance.

Symbols of Flowchart

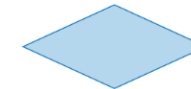
Start/End: The terminator symbol marks the start and end of the flowchart.



Process: This symbol is used to denote processes in the flowchart.



Decision: This symbol is used to make decisions in the flowchart.



Input/Output: Represents material or information entering or leaving the system.



Merge: Indicates a step where two or more sub-lists become one.

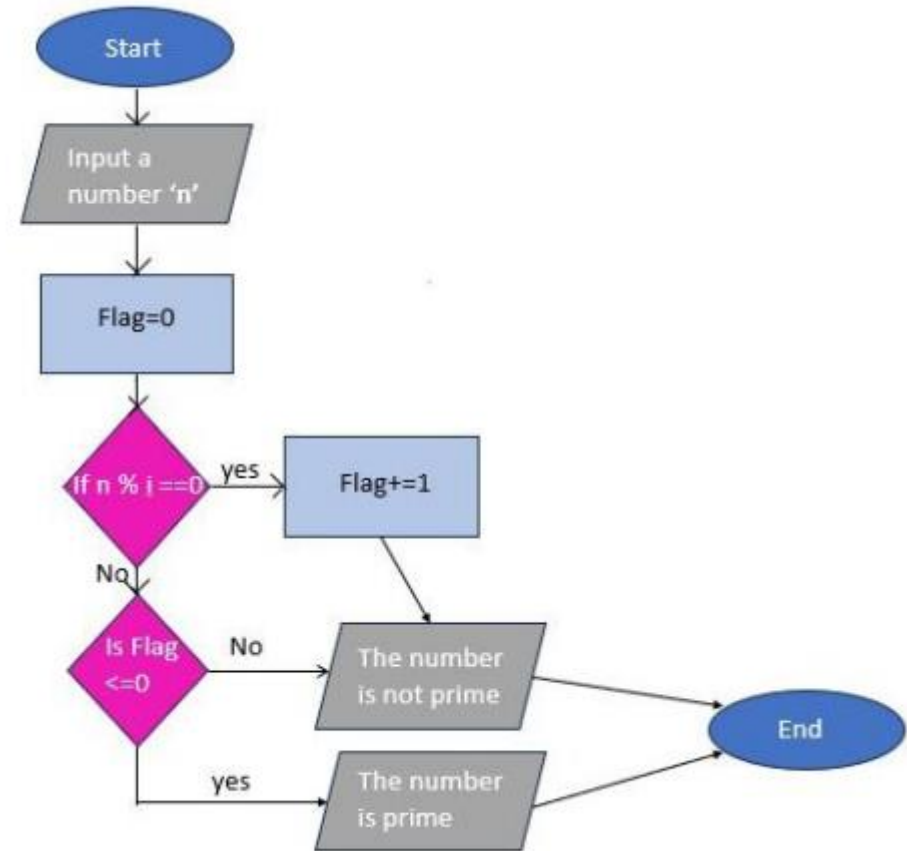


DRAW A FLOWCHART AND WRITE ITS CORRESPONDING ALGORITHM TO FIND WHETHER A NUMBER IS PRIME OR NOT.

Algorithm

1. Start
2. **Input:** Read a number n from the user.
3. **Initialize:** Set flag to 0.
4. **Check divisors:** Loop from $i = 2$ to n .
 - If $n \% i == 0$ (i.e., n is divisible by i):
 - Set flag = 1. - Break the loop.
5. **Decision:** Check the value of flag.
 - If flag == 0:
 - Print "The number is Prime."
 - Else: -
 - Print "The number is not Prime."
6. End

Flowchart



Thank You!