classmate
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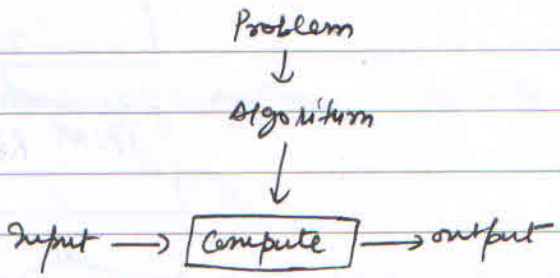
Algorithm

Definition(s)

- A set of rules for solving a problem in a finite number of steps.
- A set of steps that are followed in order to solve a mathematical problem or to complete a computer process.
- An algorithm is any well defined computational procedure that takes some value(s) as input and produce some value(s) as output.

Characteristics

1. Input - Accept zero or more inputs externally
2. Output - Must produce at least one output as result of procedure
3. Definiteness - Each instruction must be clear and unambigous.
4. finiteness - Instructions in algorithm must terminate after a finite number of steps.
5. Effectiveness - Every instruction must be very basic so that it can be carried out and must be feasible to perform on any machine.
6. Correct
7. Efficient
8. Easy to implement.



Notation of the algorithm

(AJAY RAWAT)

Example - To add two numbers

English language type

1. Ask user to enter two integer numbers.
2. Add both integer numbers.
3. Print the final sum value.

Pseudo code type

Algorithm SUM

Input: Two integer no as ONE, TWO

Output: Sum of one and TWO as RESULT

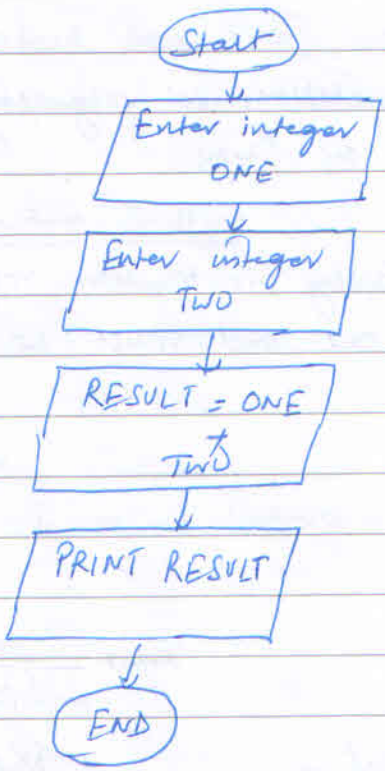
ONE ← User input required

TWO ← User input required

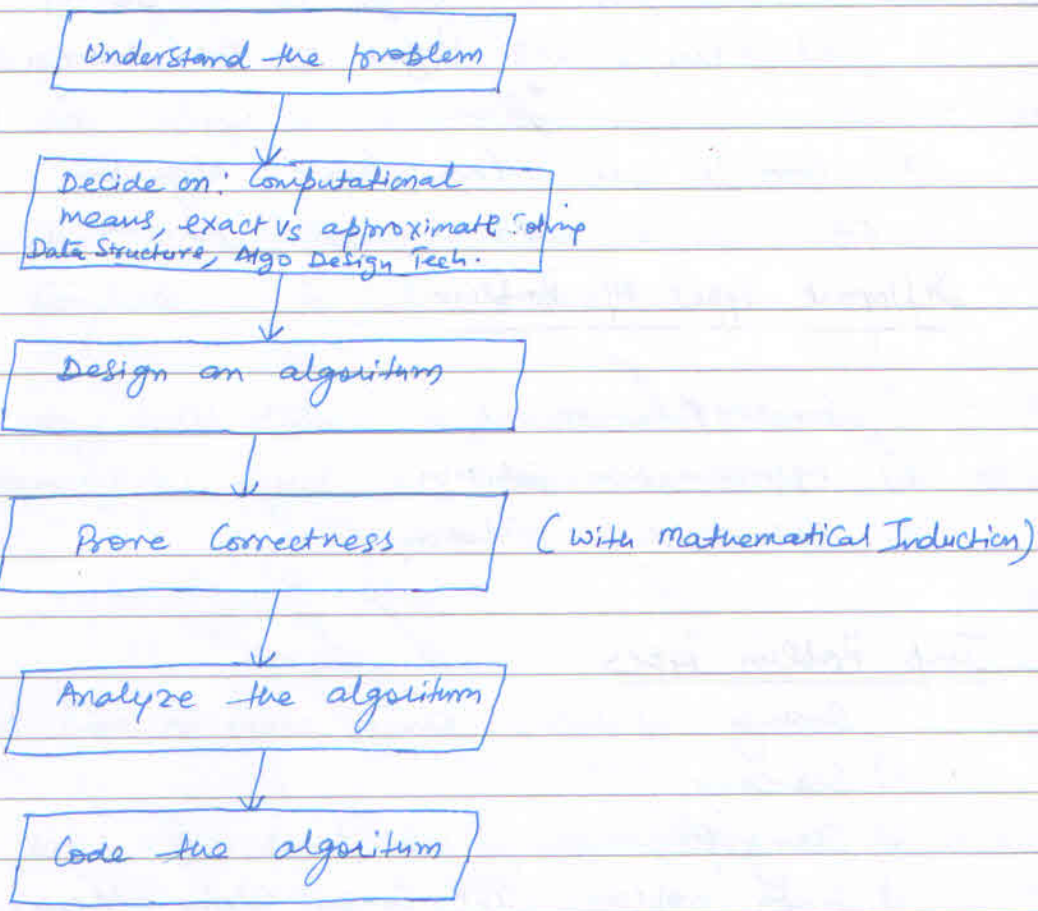
RESULT ← ONE + TWO

return result.

Flow Chart



Algorithm Process



Algorithm Design and Analysis process

Why algorithm

It is important to work in the field of Computer Science

1) Routing Communication network use Shortest path algorithm

2) Effectiveness of public key Cryptography relies on number theory algorithm

3) Computer Graphics need the Computational primitive Supplied by geometric algorithm

4) Database indices rely on Balanced Search Tree data Structure.

5) Computional biology use Dynamic programming algorithm to measure genome.

6) Search engine use algo to efficiently compute the relevance of various web pages to its search

7) Google use Page Rank algorithm

Different Types of Problem

1) Exact Solution
2) Approximation Solution
3) Optimization Solution.

Imp Problem Types

1) Sorting
2) Searching
3) String processing
4) Graph problems (TSP, Graph Coloring problem)
5) Combinatorial problem
6) Geometric problems (Closest pair prob, Convex hull prob)
7) Numerical problems (definite integral, solving eq, evaluating function)

General approach to algorithm Design

1) Divide and Conquer
2) Greedy method
3) Dynamic Programming
4) Basic Search and Traversal Technique
5) Graph Theory
6) Linear Programming
7) Approximation Algorithms
8) NP Problem.