Algorithm

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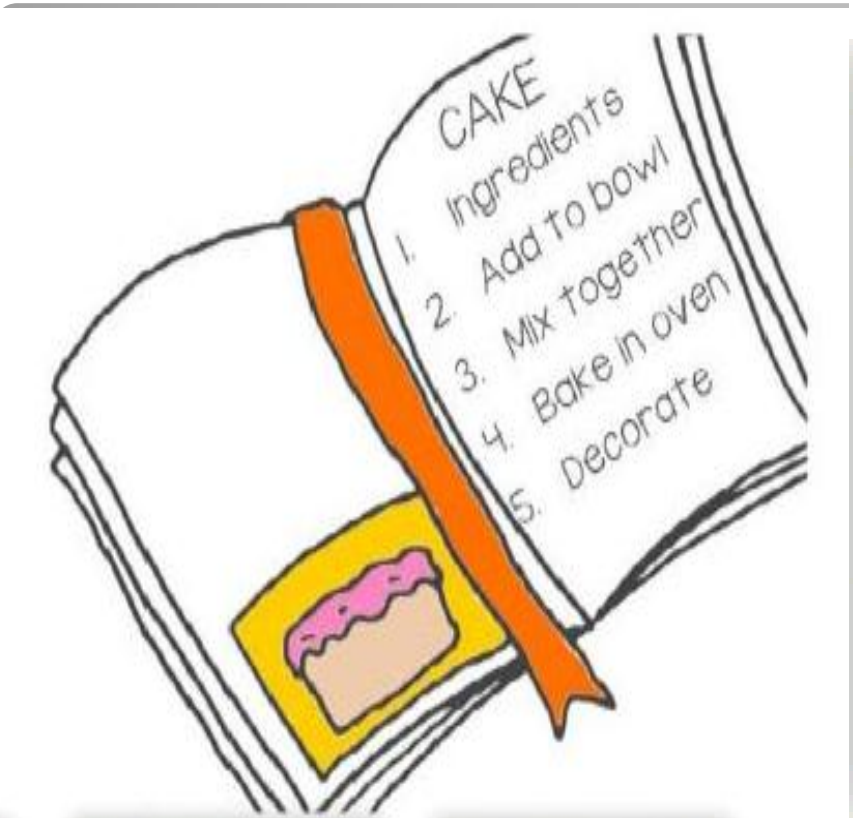
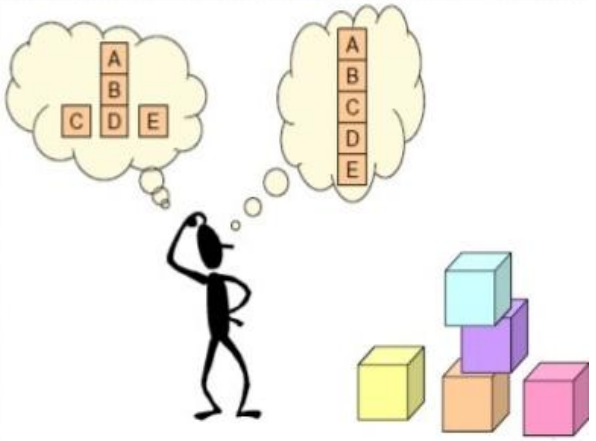


Algorithm in real life(to bake a cake)

What is a Algorithm ?

- a step-by-step problem solving process in which a solution is arrived in a finite amount of time
- finite sequence of unambiguous steps or instructions, which, if followed would ultimately terminate and give the solution of the problem



Properties of algorithms

- Input: what the algorithm takes in as input
- Output: what the algorithm produces as output
- Definiteness/unambigious

  Read

  Read a,b
- Correctness
- Finiteness: while(1)

  {-------

  }
- Effectiveness:

Start

Read a,b

Read c

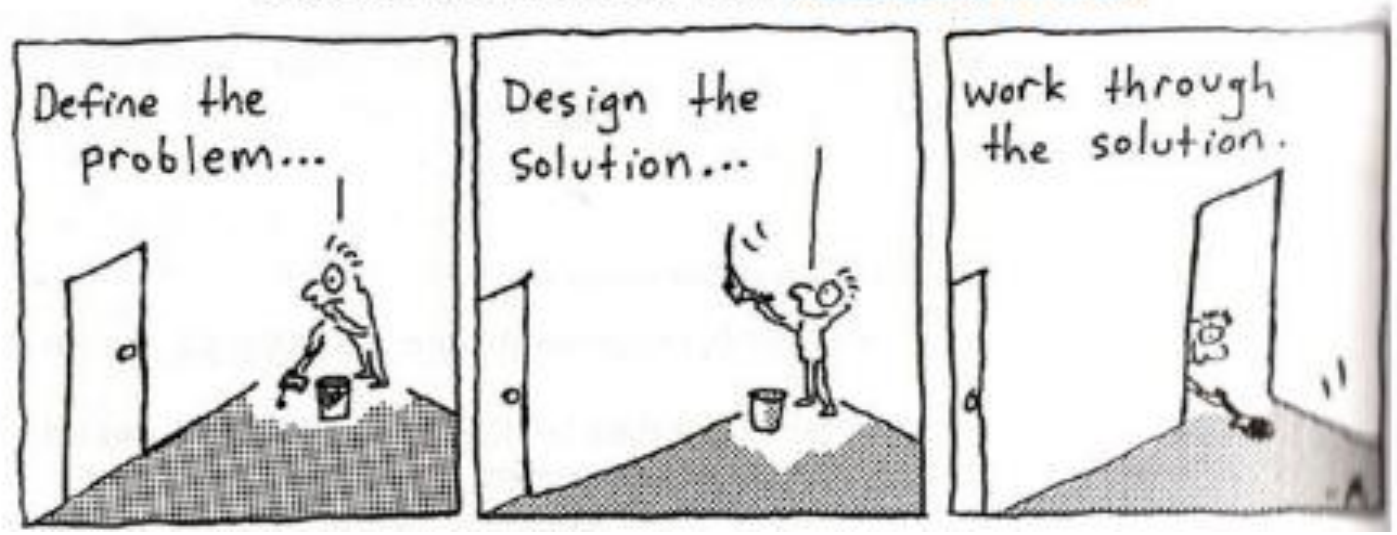
Sum=a+b

Print sum

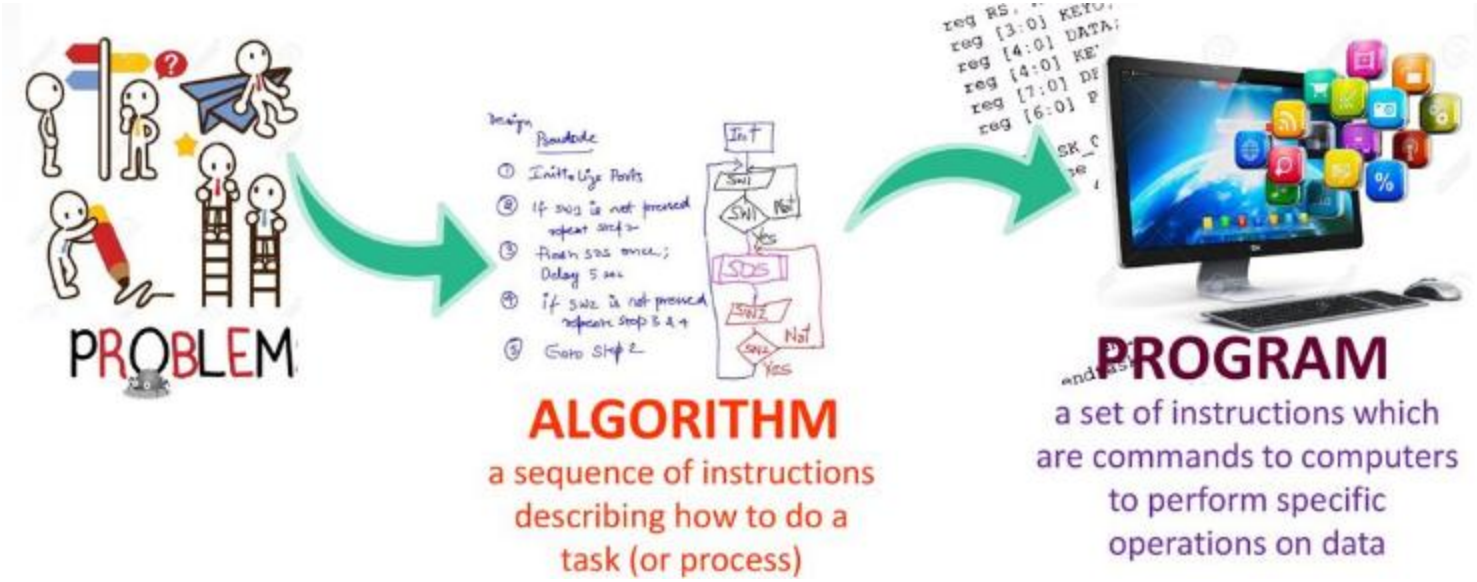
End

Why algorithm?

A program MUST be systematically and properly designed before coding begins. This design process results in the construction of an ALGORITHM.



Algorithm and programs



- Algorithms:
  - use natural language
  - written by domain expert
  - Software and hardware independent
  - Analyze algorithms

Algorithm representation

- Pseudo code

```
Program start
Initialise variable A=0
Initialise variable B
Start infinite loop
    Call function SegConvert withinput A
    SegConvert returns value B
    Output B to LED port
    Increment A
    If A > 9
        A=0
    Call function Delay for 500ms
End infinite loop
```

- Flowchart

ALGORITHM TO FIND THE AREA OF A RECTANGLE

The formulas: area = length * width

Input	Process	Output
Input variable: length width	Processing item: area Formula: area = length x width Step / Solution algorithm: get input calculate area display output	Output: area

```
Start
  Read length
  Read width
  Calculate area of a rectangle
  Display area of a rectangle
End
```

OR

```
Start
  Input length
  Input width
  Calculate area of a rectangle
  Output area of a rectangle
End
```

How to write a algorithm

- The **problem** that is to be solved
- The **constraints** of the problem
- The **input** to be taken
- The **output** to be expected
- The **solution** to this problem

- Add 3 numbers and print their sum.
- The numbers must contain only digits and no other characters
- The three numbers to be added.
- The sum of the three numbers taken as the output.
- The solution consists of adding the 3 numbers. It can be done with the help of '+' operator, or bit-wise

Algorithm to add three numbers

- Start
- Get input

  Read num1 num2 num3
- Calculate sum

  sum = num1 + num2+num 3
- Display output
- Print sum
- End

ALGORITHM TO FIND THE LARGEST OF THREE NUMBERS

```
Step1: Start
Step2: Read the value of a, b, c
Step3: IF (a>b) and (a>c) THEN
                print a is largest
       ELSE IF (b>c) THEN
                print b is largest
       ELSE
                print c is largest
Step4: Stop
```

ALGORITHM TO FIND THE LARGEST OF THREE NUMBERS

1) Start
2) Read 3 numbers: num1, num2, num3
3) if num1 > num2 then go to step 5
4) if num2 > num3 then
print num2 is largest
else
print num3 is largest
goto step 6
5) if num1 > num3 then
print num1 is largest
else
print num3 is largest
6) end.

- References

1)https://depositphotos.com/27462911/stock-photo-flow-chart-diagram.html
2)https://www.geeksforgeeks.org/introduction-to-algorithms/
3) https://en.wikipedia.org/wiki/Algorithm

Thank You