# Algorithm

# Algorithm

**Definition**

- A set of sequential steps usually written in Ordinary Language to solve a given problem is called **Algorithm**.

- It may be possible to solve to problem in more than one ways, resulting in more than one algorithm.
- The choice of various algorithms depends on the factors like reliability, accuracy and easy to modify.
- The most important factor in the choice of algorithm is the time requirement to execute it, after writing code in High-level language with the help of a computer.
- The algorithm which will need the least time when executed is considered the best.

# Steps involved in algorithm development

**Step1. Identification of input**:

- For an algorithm, there are quantities to be supplied called input. The input is to be identified first for any specified problem.

**Step2: Identification of output**:

- The input is to be identified first for any specified problem.

**Step3 : Identification the processing operations**:

- All the calculations to be performed in order to lead to output from the input are to be identified in an orderly manner.

**Step4 : Processing Definiteness**:

- The instructions composing the algorithm must be clear and there should not be any ambiguity in them.

## Step5 : Processing Finiteness:

- If we go through the algorithm, then for all cases, the algorithm should terminate after a finite number of steps.

## Step6 : Possessing Effectiveness:

- The instructions in the algorithm must be sufficiently basic to be carriet out easily.

# Example 1

Suppose we want to find the average of three numbers, the algorithm is as follows

**Step 1** Read the numbers a, b, c
**Step 2** Compute the sum of a, b and c
**Step 3** Divide the sum by 3
**Step 4** Store the result in variable d
**Step 5** Print the value of d
**Step 6** End of the program

# Example 2

**Write an algorithm to calculate the simple interest using the formula.**
**Simple interest = P*N* R/100.**

**Where P is principle Amount, N is the number of years and R is the rate of interest.**

Step 1: Read the three input quantities' P, N and R.
Step 2 : Calculate simple interest as
Simple interest = P* N* R/100
Step 3: Print simple interest.
Step 4: Stop.

# Example 3: Area of Triangle

**Write an algorithm to find the area of the triangle.**
**Let b, c be the sides of the triangle ABC and A the included angle between the given sides.**

Step 1: Input the given elements of the triangle namely sides b, c and angle between the sides A.
Step 2: Area = (1/2) *b*C* sin A
Step 3: Output the Area
Step 4: Stop.

# Example 4

**Write an algorithm to find the largest of three numbers X, Y, Z.**

Step 1: Read the numbers X,Y,Z.
Step 2: if (X > Y)
Big = X
else BIG = Y
Step 3 : if (BIG < Z)
Step 4: Big = Z
Step 5: Print the largest number i.e. Big
Step 6: Stop.

# Example 5

**Write an algorithm to calculate the perimeter and area of rectangle. Given its length and width.**

Step 1: Read length of the rectangle.
Step 2: Read width of the rectangle.
Step 3: Calculate perimeter of the rectangle using the formula perimeter = 2* (length + width)
Step 4: Calculate area of the rectangle using the formula area = length *width.
Step 5: Print perimeter.
Step 6: Print area.
Step 7: Stop.