Algorithm can be defined as: “A sequence of activities to be processed for getting desired output from a given input.”

Before writing an algorithm for a problem, one should find out what is/are the inputs to the algorithm and what is/are expected output after running the algorithm.

While writing algorithms we will use following symbol for different operations:
‘+’ for Addition
‘-’ for Subtraction
‘*’ for Multiplication
‘/’ for Division and
‘= ’ for assignment. For example A= X*3 means A will have a value of X*3.

Example of Algorithm

Problem 1: Find the area of a Circle of radius r.

Inputs to the algorithm:
Radius r of the Circle.
Expected output:
Area of the Circle

Algorithm:

Step1: Read input the Radius r of the Circle
Step2: Area= PI*r*r // calculation of area
Step3: Print Area
**Problem 2:** Write an algorithm to read two numbers and find their sum.

Inputs to the algorithm: First num1. Second num2.

Expected output: Sum of the two numbers.

Algorithm:

Step1: Start
Step2: Read\input the first num1.
Step3: Read\input the second num2.
Step4: Sum = num1 + num2 // calculation of sum
Step5: Print Sum
Step6: End

**Problem 3:** Convert temperature Fahrenheit to Celsius

Inputs to the algorithm:
Temperature in Fahrenheit

Expected output:
Temperature in Celsius

**Algorithm:**

Step1: Start
Step 2: Read Temperature in Fahrenheit F
Step 3: C \( \frac{5}{9} \times (F - 32) \)
Step 4: Print Temperature in Celsius: C
Step5: End
Problem 3: Exchanging Values of Two Variables

- Problem definition: Exchanging values of two variables.
- Analysis: Two variables x and y contain two different values.
- Swap the values of x and y such that x has y's value and y has x's value.
- Solving by example: Let us consider two variables x and y containing values 8 and 20 respectively.
- The original values of x and y are:

```
   x  y
  8  20
```

- The requirement is once the algorithm is performed, the results should be

```
   x  y
  20  8
```

- If you think by just saying,
  - \( x = y \); \( y = x \);
  - The value gets swapped, then you are mistaken.
  - These instructions are atomic in nature and hence \( x = y \) means that the value of \( x \) is lost.
- So, we have to use a temporary variable temp to store the value of \( x \):

```
  temp = x;
  x = y;
  y = temp;
```
The value of 'x' and 'y' is swapped.

Algorithm Definition

Step 1: Start.
Step 2: Get the values of x and y.
Step 3: Store x's value to temp. (temp: = x)
Step 4: Store y's value to x. So, x has y's value now (x: = y)
Step 5: Store temp's value (the value of the old 'x') in y.
Step 6: Stop.