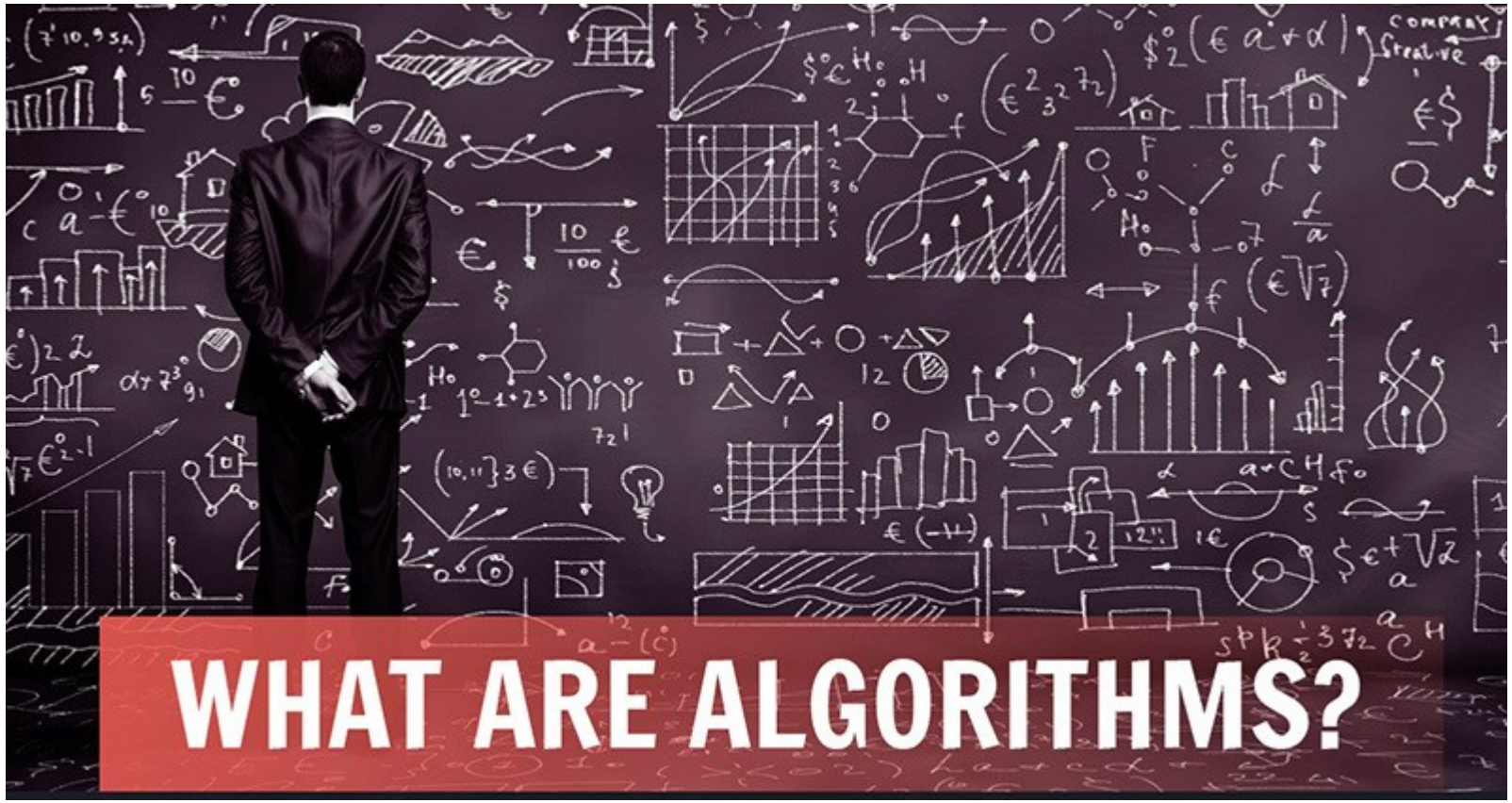
Session 2_1

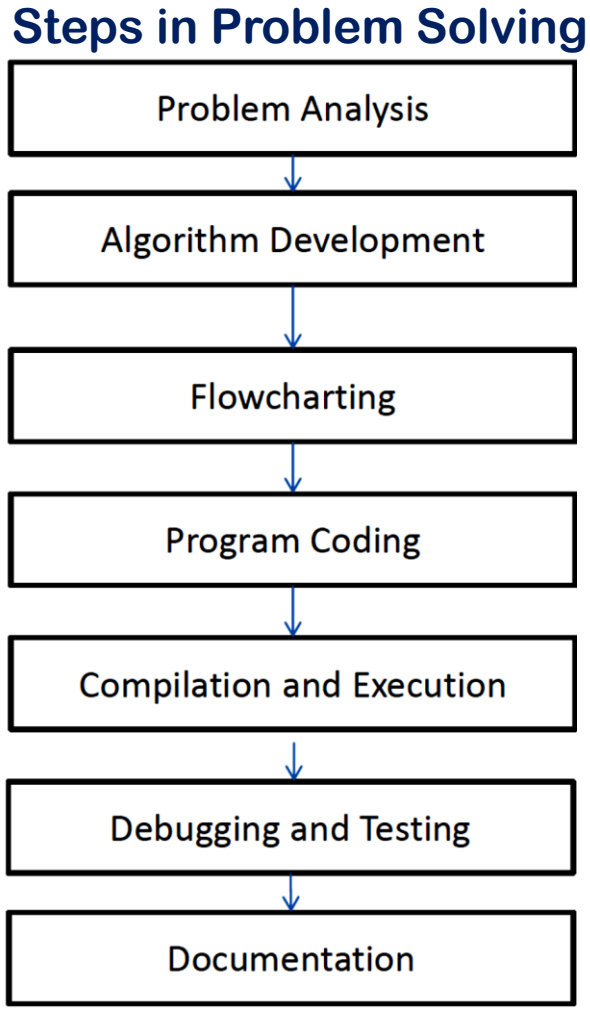
Algorithms

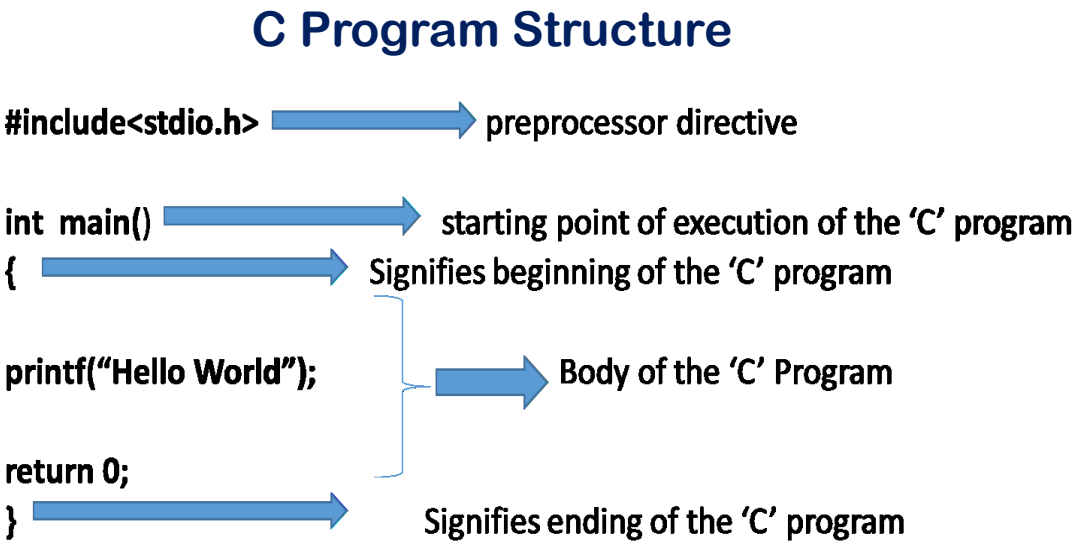


Problem Solving Using Computers - Recap

Problem solving is a part of our day to day activity.

- **Analysis**
- **Algorithm**
- **Flowchart**
- **Code**
- **Documentation**





Learning objectives

To learn and appreciate the following concepts

- ✓Introduction to algorithms
- ✓Algorithms for simple problems

Session outcome

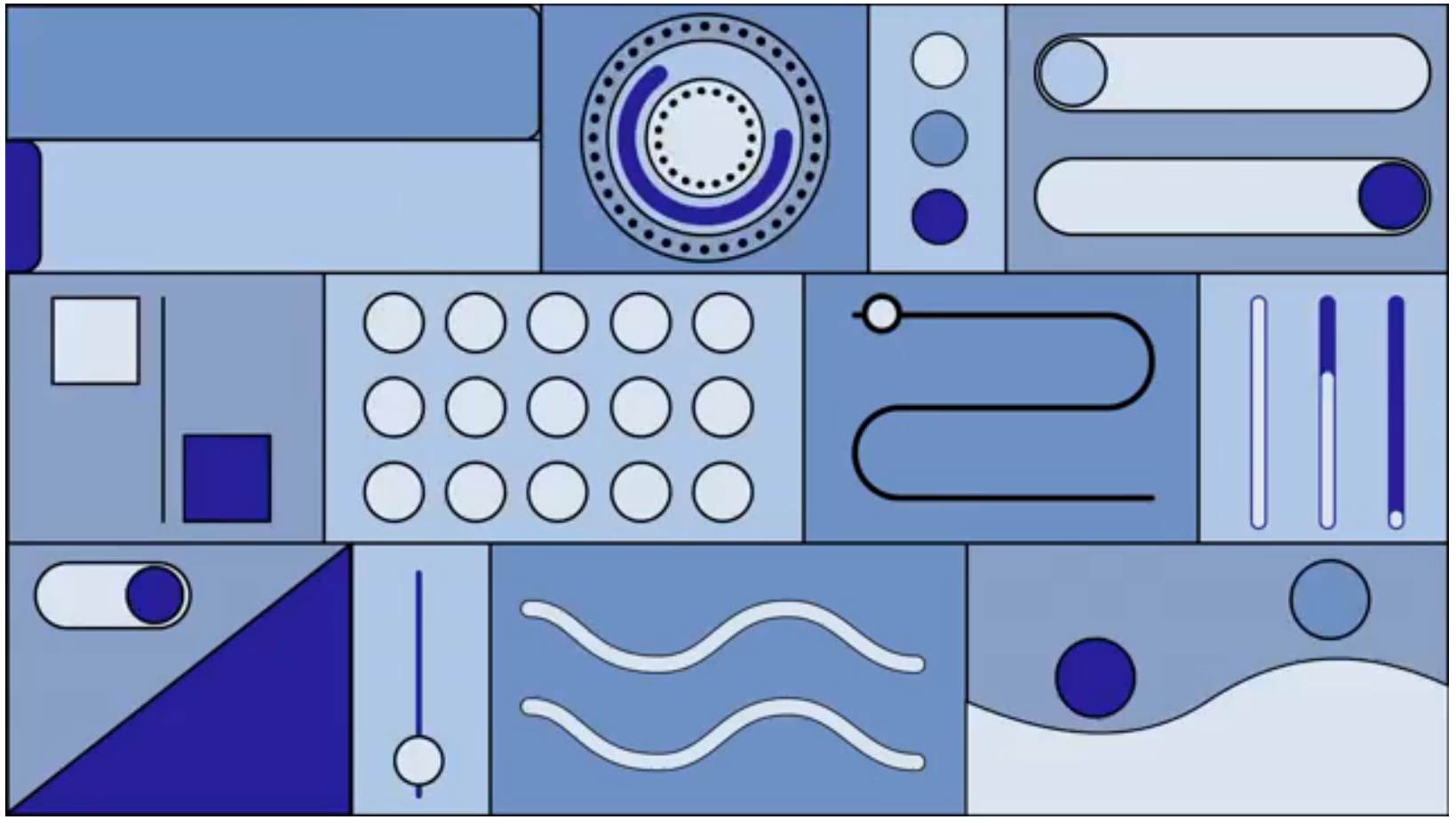
- ✓At the end of session the student will be able to write
  - ✓Algorithms for simple problems

Algorithm

- ✓A step by step procedure to solve a particular problem
- ✓Named after Arabic Mathematician Abu Jafar Mohammed Ibn Musa

  Al Khowarizmi

Relevance of an algorithm to Computer Science



https://www.youtube.com/watch?v=kM9ASKAni_s

Algorithmic Notations

- **Name of the algorithm** [*mandatory*]

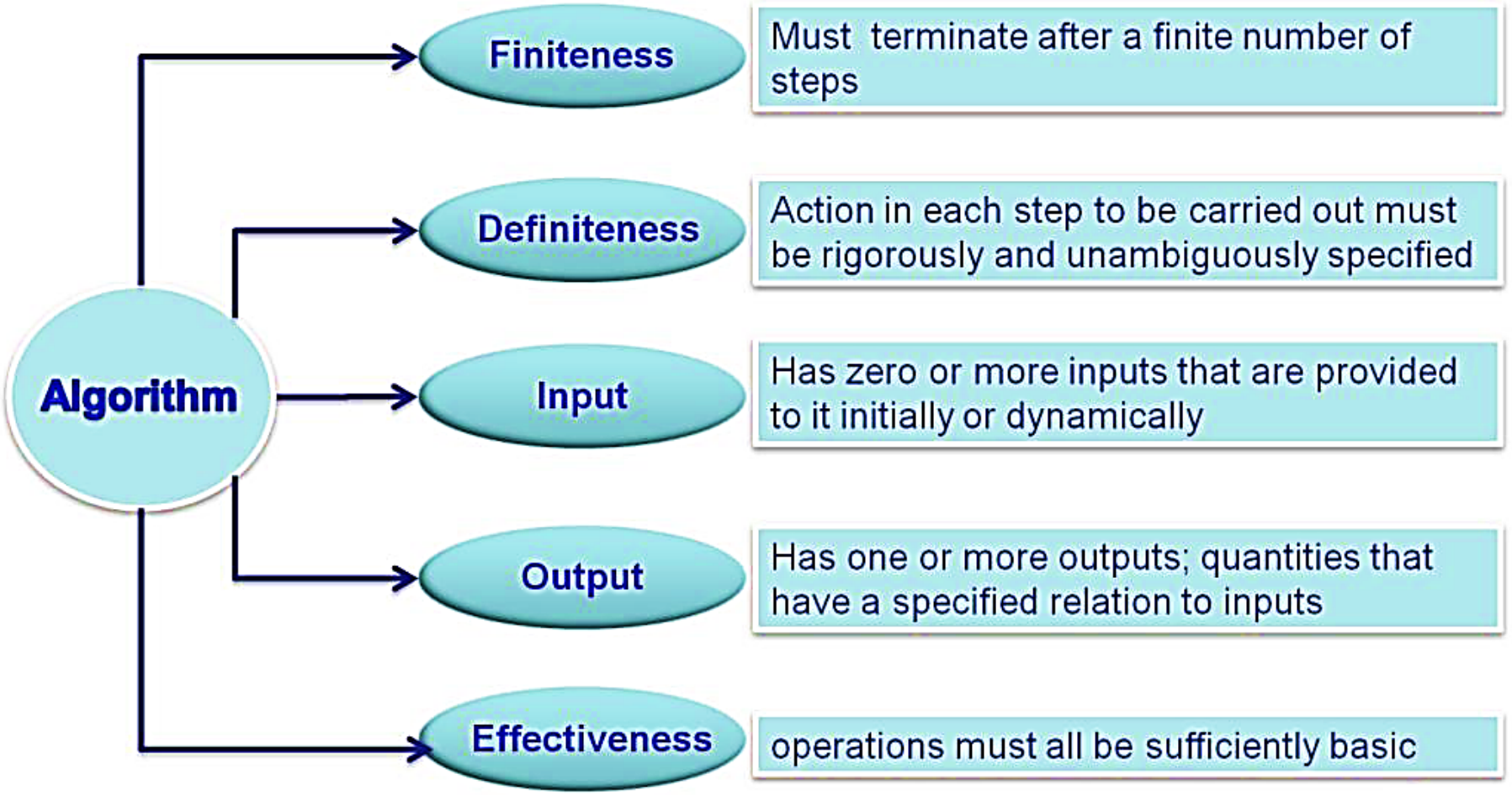
  [*gives a meaningful name to the algorithm based on the problem*]
- **Start** [*Begin of algorithm*]
- **Step Number** [*mandatory*]

  [*indicate each individual simple task*]
- **Explanatory comment** [*optional*]

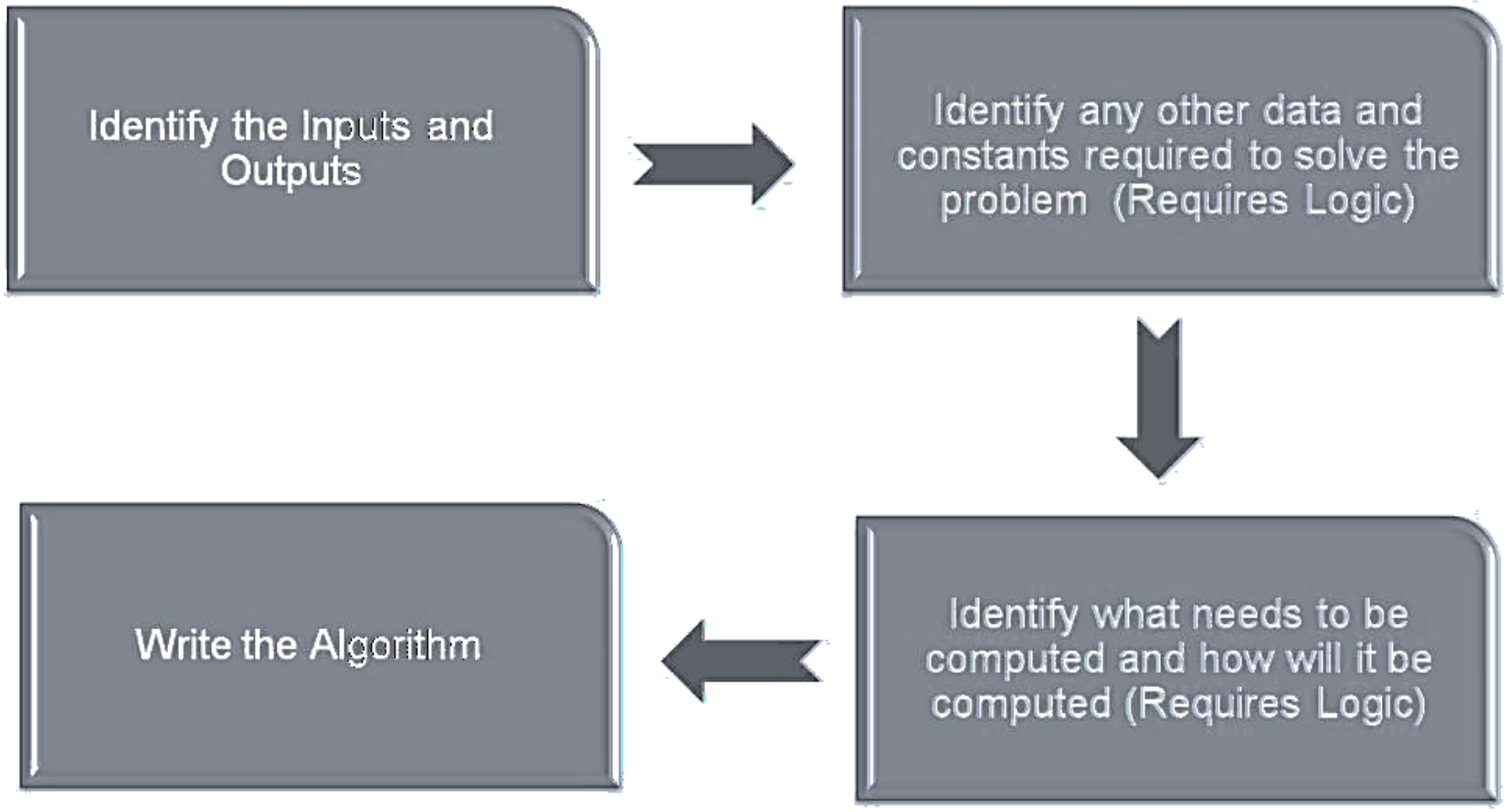
  [*gives an explanation for each step, if needed*]
- **Termination** [*mandatory*]

  [*tells the end of algorithm*]

Properties of an algorithm



Steps to develop an algorithm



Algorithm to compute the area of circle!!!

Name of the algorithm : **Compute the area of a circle**

Step1: **Start**

Step 2: **Input radius**

Step 3: [*Compute the area*]

Area ← 3.1416 * radius * radius

Step 4: [*Print the Area*]

Print 'Area of a circle =', Area

Step 5: [*End of algorithm*]

Stop

Algorithm to Interchange values of two variables!!!

Name of the algorithm: **Interchange values of 2 variables**

Step 1: **Start**

Step 2: **Input A,B**

Step 3: **temp ← A**

Step 4: **A←B**

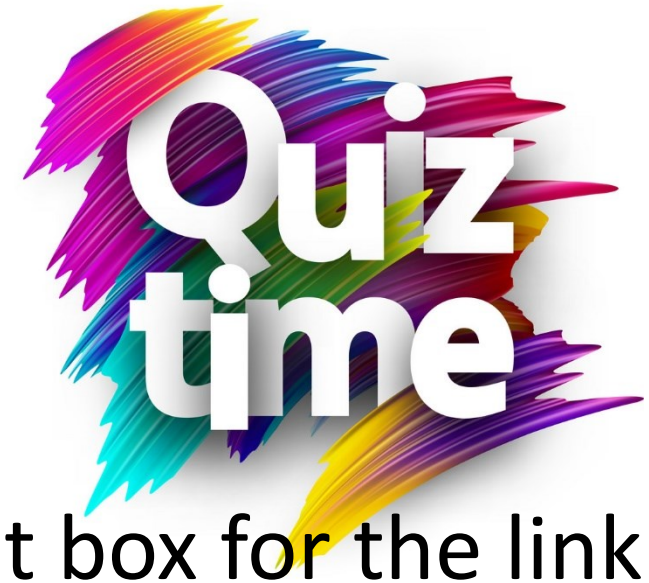
Step 5: **B←temp**

Step 6: **Print 'A=' , A**

Print 'B=' , B

Step 7: [*End of Algorithm*]

Stop



Go to posts/chat box for the link to the question

submit your solution in next 2 minutes

The session will resume in 3 minutes

Algorithm to find largest of 3 numbers!!!

Name of the algorithm: **Find largest of 3 numbers**

Step 1: **Start**

Step 2: [Read the values of A, B and C]

Read A, B, C

Step 3: [Compare A and B]

if A > B Go to step 5

Step 4: [Otherwise compare B with C]

if B > C then

Print 'B is largest'

else

Print 'C is largest'

Go to Step 6

Step 5: [Compare A and C for largest]

if A>C then

Print 'A is largest'

else

Print 'C is largest'

Step 6: [End of the algorithm]

Stop

What's great about algorithm!!! Think

- By developing a good understanding of a large range of algorithms, you will be able to choose the right one for a problem and apply it properly.

Tutorial on Algorithms

- Write an algorithm to add, subtract, multiply and divide two integers
- Write an algorithm to swap values of two variables without using a third variable.