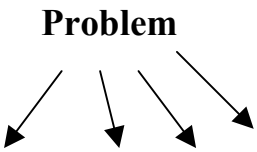
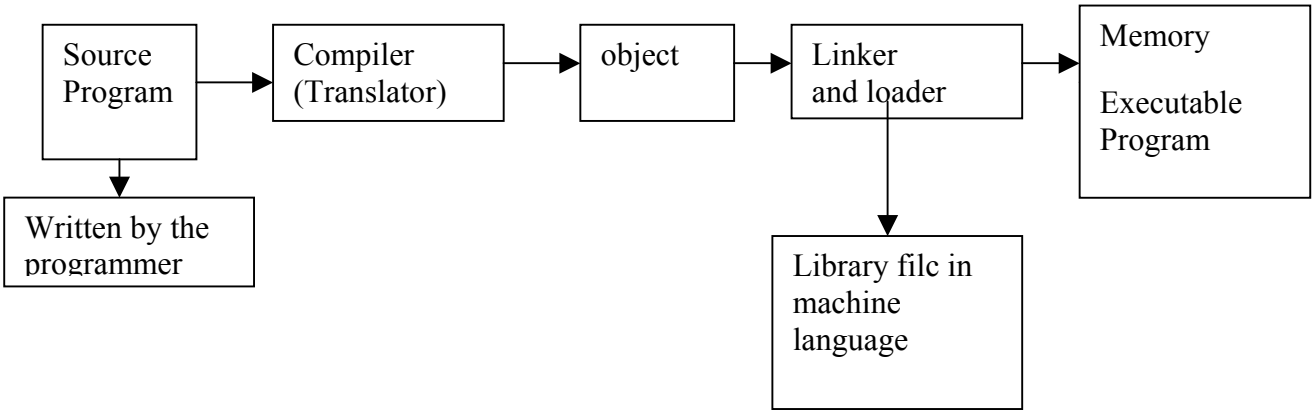
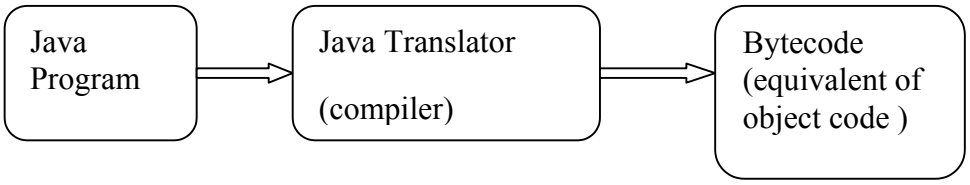
How to Write and Execute a Program?



- **Sub problems (Divide and conquer the problem into sub problems)**





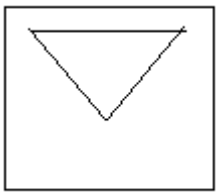
Robo :

F(x):move x units forward

R(x):turn x degrees to the right

L(x):turn x degrees to the right

P:pen up and pen down



r(30)
f(200)
r(120)
f(200)
r(120)
f(200)

PROBLEM SOLVING& PROGRAMMING

- **The purpose of writing a program is to solve a problem. Problem solving consists of multiple steps:**

  1. **Understand the problem.**
  2. **Dissect the problem into manageable pieces.**
  3. **Design a solution.**
  4. **Consider alternatives to the solution and refine it.**
  5. **Implement the solution.**
  6. **Test the solution and fix any problems that exist.**

❖ **Key Idea:Divide&Conquer!!**

Problems

Sub Problems Sub Problems

- **<u>ALGORITHM:</u> It is the step by step definition of the solution of a problem. In other words, we can say that it is the step-by-step process for solving a problem. For you to understand it clearly some examples for algorithms are stated below:**

➢ **A recipe,**
➢ **Travel directions,**
➢ **Operating a machine, etc.**

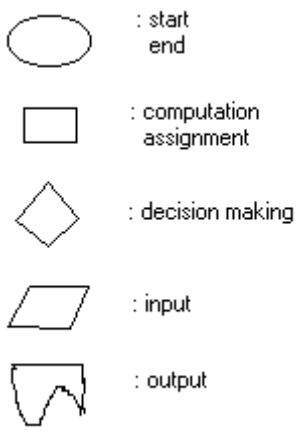
!!!*REMARK: Every program implements an algorithm. So every software developer should spend time thinking about the algorithm before writing any code.*

An algorithm must:

✓ **Have more than one input,**
✓ **Have at least one output,**
✓ **Be clear,have unambigious steps,**
✓ **Stop, come to an end,**
✓ **Be correct!!**

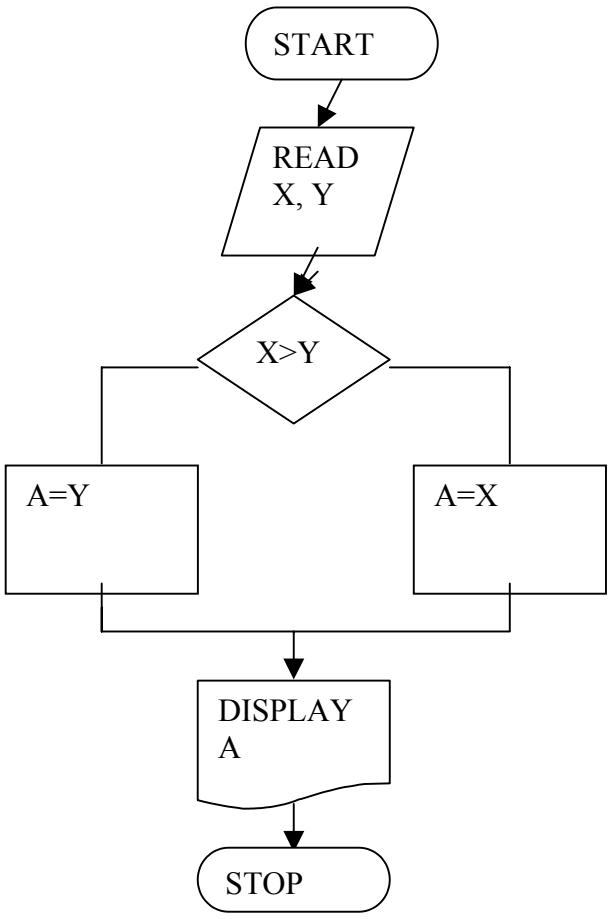
- **An algorithm can either be described by a flowchart or by using pseudo code.**

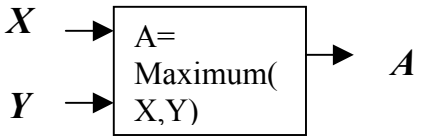
FLOWCHART SYMBOLS:



Example: Find the maximum of x and y, assign it to A.

ALGORITHM





Black Box: We know what it does for us but we do not know how.

- PSEUDO CODE: It is a mixture of code statements and English phrases, writing the solution in natural language.
- // Find the maximum of x, y and assign it to A

read x,y

if x>y then

A=x

else

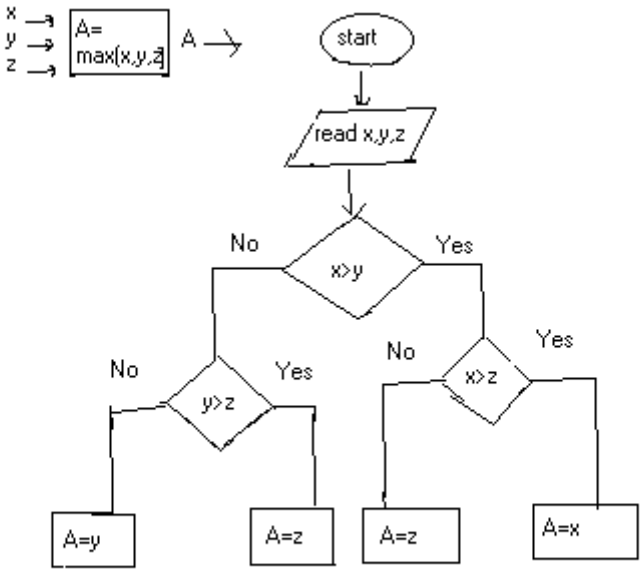
A=y

(end if)

display A

stop

Example: Find maximum of X,Y,Z and assign it to A



Trace : X/1 Y/5 Z/10 A/10