

## Lab 2 Introduction to Flowcharts and Algorithms

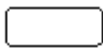
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Lab 2 aims at introducing you to flowcharts and emphasizing on algorithms.

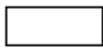
### **PART I: Introduction to flowcharts**

A flowchart is a graphical representation of an algorithm. These flowcharts play a vital role in the programming of a problem and are quite helpful in understanding the logic of complicated and lengthy problems. Once the flowchart is drawn, it becomes easy to write the program in any high level language. Often we see how flowcharts are helpful in explaining the program to others. Hence, it is correct to say that a flowchart is a must for the better documentation of a complex program.

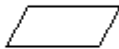
Flowcharts are usually drawn using some standard symbols; however,



Start or end of the program



Computational steps or processing function of a program



Input or output operation



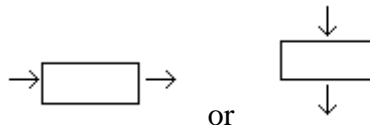
Decision making and branching



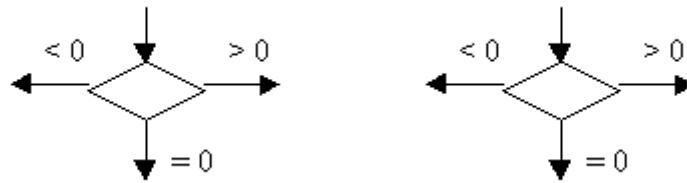
Connector or joining of two parts of program

The following are some guidelines in flowcharting:

- In drawing a proper flowchart, all necessary requirements should be listed out in logical order.
- The flowchart should be clear, neat and easy to follow. There should not be any room for ambiguity in understanding the flowchart.
- The usual direction of the flow of a procedure or system is from left to right or top to bottom.
- Only one flow line should come out from a process symbol.



- Only one flow line should enter a decision symbol, but two or three flow lines, one for each possible answer, should leave the decision symbol.



- f. Only one flow line is used in conjunction with terminal symbol.



- h. If the flowchart becomes complex, it is better to use connector symbols to reduce the number of flow lines. Avoid the intersection of flow lines if you want to make it more effective and better way of communication.
- i. Ensure that the flowchart has a logical *start* and *finish*.
- j. It is useful to test the validity of the flowchart by passing through it with a simple test data.

## PART II: Example of a flowchart:

Problem 1: Write an algorithm and draw the flowchart for finding the average of two numbers

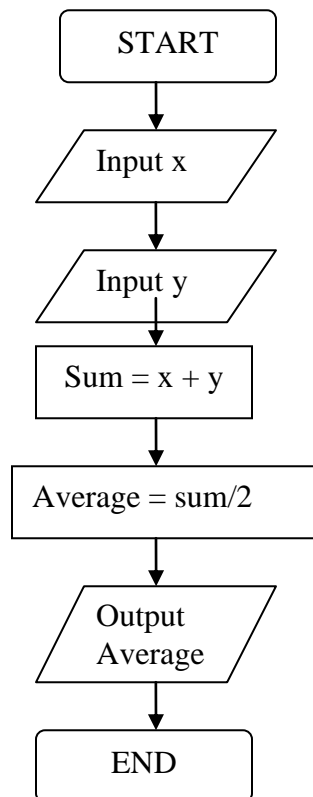
### Algorithm:

Input: two numbers x and y

Output: the average of x and y

Steps:

1. input x
2. input y
3.  $\text{sum} = x + y$
4.  $\text{average} = \text{sum} / 2$
5. output average



### **PART III: An exercise**

Problem 2: Write an algorithm for finding the area of a rectangle

Hints:

- define the inputs and the outputs
- define the steps
- draw the flowchart