

Lesson-1

Algorithm

Use of algorithm in programming

Developing algorithm to solve particular problem

In mathematics and computer science, an algorithm is a step-by-step procedure for calculations. Algorithms are used for calculation, data processing, and automated reasoning. Algorithms resemble recipes. Recipes tell you how to accomplish a task by performing a number of steps. For example, to bake a cake the steps are: preheat the oven; mix flour, sugar, and eggs thoroughly; pour into a baking pan; and so forth.

You will learn

- ✓ Use of algorithm in programming
- ✓ Developing algorithm to solve a particular problem

Goals of Algorithm Study

- To develop framework for instructing computer to perform tasks
- To introduce notion of algorithm as means of specifying how to solve a problem
- To introduce and appreciate approaches for defining and solving very complex tasks in terms of simpler tasks;

Simple Questions based on Algorithm

Algorithm: Calling a friend on the telephone

Input: The telephone number of your friend.

Output: None

Steps:

1. Pick up the phone and listen for a dial tone
2. Press each digit of the phone number on the phone
3. If busy, hang up phone, wait 5 minutes, jump to step 2
4. If no one answers, leave a message then hang up
5. If no answering machine, hang up and wait 2 hours, then jump to step 2
6. Talk to friend
7. Hang up phone

Algorithm to create Maggie noddle:

Step 1: Start

Step 2: Take pan with water

Step 3: Put pan on the burner

Step 4: Switch on the gas/burner

Step 5: Put maggi and masala

Step 6: Give two minutes to boil

Step 7: Take off the pan

Step 8: Take out the maggi with the help of fork/spoon

Step 9: Put the Maggi on the plate and serve it

Step 10: Stop.

Algorithm: To find $(a + b)^2 = (a + b) * (a + b)$

Input: Two numbers a and b.

Output: Result of $(a + b)^2$

Steps:

1. Take numbers a, b, c.

2. Input the values of a and b
3. $C=a+b$
4. Print $c*c$

Algorithm: To find Perimeter of rectangle

Input: Two numbers l and b.

Output: Result $l*b$

Steps:

1. Take numbers l, b, c, d.
2. Input the values of l and b
3. $c=l*b$
4. $d=2*c$
5. Print d

Conditions in Algorithm

Algorithm: To check whether a person can vote or not

Input: A number age.

Output: Yes or No

Steps:

1. Take a number age.
2. Input the age of the person
3. If($age \geq 18$) goto step 4

Else

Goto step 5

4. Print "You can vote"
5. Print "You can't vote"

Algorithm: To give a bonus of Rs 1000 to those employees whose salary is more than Rs 5000

Input: Salary.

Output: New Salary

Steps:

1. Take numbers salary and total.
2. Input the salary of the person
3. If(salary \geq 5000) goto step 4
Else
Goto step 5
4. total=salary+1000
5. total=salary+0
6. Print total

SUMMARY

1. An algorithm is a step-by-step procedure for calculations.
2. To develop framework for instructing computer to perform tasks as one of the goal of Algorithm.

EXERCISES

A. Short Answer Question

1. What is an algorithm?
2. Write few goals of an algorithm.?
3. Write an algorithm to find Area of square?

Lesson-2

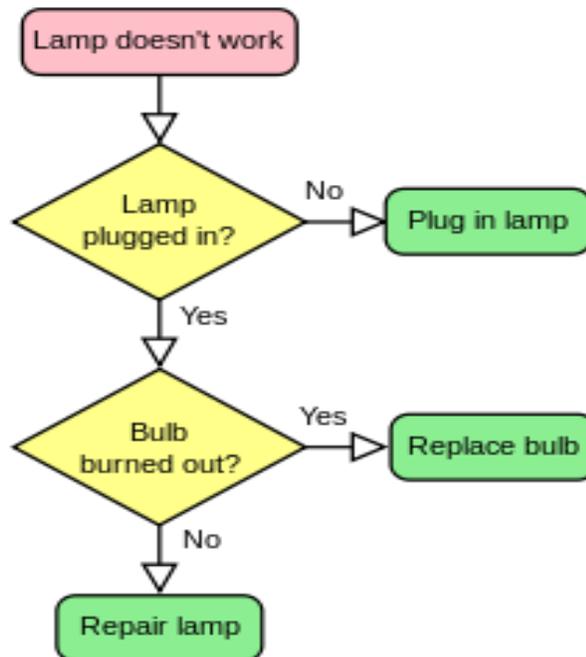
Flow Char

About flow chart

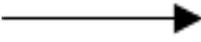
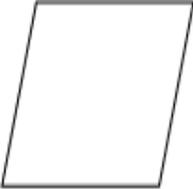
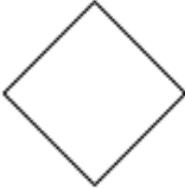
A flowchart is a type of diagram that represents an algorithm or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. This diagrammatic representation illustrates a solution to a given problem.

You will learn

- ✓ About flow chart
- ✓ Various types of box used in flow chart and their use (terminal box, input/output box, processing box, decision box)
- ✓ Question based on sequence, selection and iteration

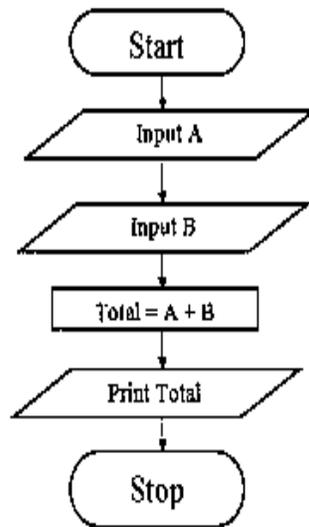


Various types of box used in flow chart:

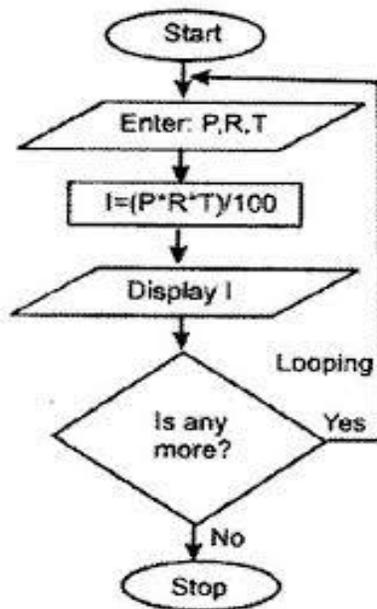
Symbol	Name	Meaning
	<i>Flowline</i>	Used to connect symbols and indicate the flow of logic.
	<i>Terminal</i>	Used to represent the beginning (Start) or the end (End) of a task.
	<i>Input/Output</i>	Used for input and output operations, such as reading and displaying. The data to be read or displayed are described inside.
	<i>Processing</i>	Used for arithmetic and data-manipulation operations. The instructions are listed inside the symbol.
	<i>Decision</i>	Used for any logic or comparison operations. Unlike the input/output and processing symbols, which have one entry and one exit flowline, the decision symbol has one entry and two exit paths. The path chosen depends on whether the answer to a question is "yes" or "no."

Question based on sequence, selection and iteration

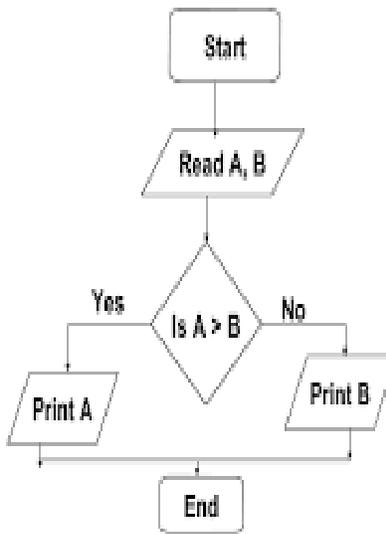
Q 1. Draw a flowchart to find the sum of two numbers



Q 2. Draw a flowchart to find the simple interest.



Q 2. Draw a flowchart to find bigger number among two numbers (selective)



Q3. Draw a flow chart to find factorial of any number. (iteration)

