

→ best assignment.

(algo & sol)

EDG

(A) → algorithm. → eg = A var (means a variable value & value)

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## 03 : FUNDAMENTALS OF PROBLEM SOLVING AND ALGORITHMS

\* Problem Solving :-  
It is the core of CS.

- \* To solve a prob →
  - a) Understand the problem
  - b) Formulate a model
  - c) Develop an algorithm
  - d) write the program
  - e) Test the program
  - f) Evaluate the solution.

\* Algorithm :- A set of sequential steps usually written in ordinary language to solve a given prob.

\* Pseudo code :- It is a method of describing comp algorithms using a combination of natural lang

& programming lang.

\* Flow chart :- Are written with program flow from top of a pg to bottom.

\* Top-down design :- Method of solving problem in broken down into smaller sub problems.

\* Algorithm of finding area of a circle  
Input to (A) : Radius & of the circle  
Expected output : Area of Circle

(A) :

Step 1 : Input the radius of circle  
Step 2 : Area = PI \* R \* R  
Step 3 : Print Area.

→ Types of control sequences :-

1) Sequence (Iteration)

2) Branching (Selection)

3) Loop (Repetition)

\* In flowchart branching is represented by diamond-shaped decision box. → Selection etc.

- (pre) of (a) :-
  - 1)  $\square$  → process
  - 2)  $\square \rightarrow \square$  → transition
  - 3)  $\square \rightarrow \diamond$  → decision
  - 4)  $\square \rightarrow \circ$  → connector
  - 5)  $\square \rightarrow \square$  → predefined process.

\* round-edged  $\square$  → represent starting & ending activities.

\*  $\square$  → an activity / step.

\* Rules for flowchart

\* Each step within a process → a single  $\square$  → activity (process symbol)

- All boxes are connected with arrows.  
- Thus entry point and exit point of the symbol exists no other outgoing points.

\* Diamond → a decision point

- Decision symbol has 2 exit points.

\* flow lines → progression / transition

- minimum for 1 step to another.

\* Chart typically utilize specialized symbols.

- Independent regions have their own symbols.

independent flow charts.

→ Advantages of F-charts :-

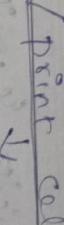
- \* Communication
- \* Effective analysis.
- \* Proper documentation.
- \* Efficient coding.
- \* Proper Debugging.
- \* Efficient program maintenance.

→ Disadvantages of F-charts :-

- \* Complex logic.
- \* Alternating in modifications.
- \* Reproduction.
- \* F. chart to convert temp. from Fahrenheit to Celsius.

(a)

2) (a) Go F.C to find true  $\Rightarrow$  no blno.



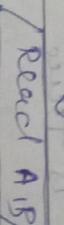
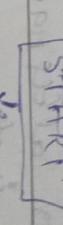
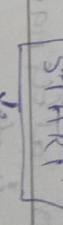
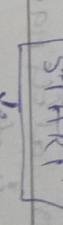
Step 1 : Start

Step 2 : Input A and B

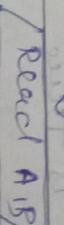
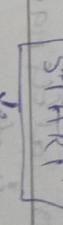
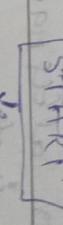
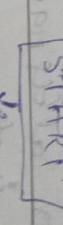
Step 3 : If A > B then print A.

Step 4 : If B > A then print B

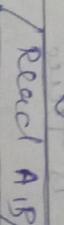
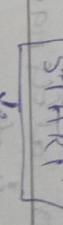
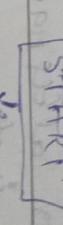
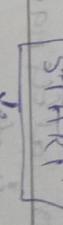
Step 5 : End.



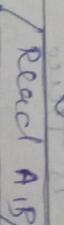
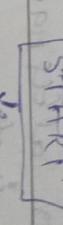
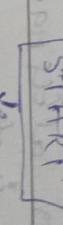
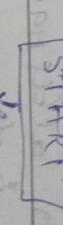
- Step 1 : Start
- Step 2 : Read F
- Step 3 :  $C \leftarrow 519 * (F - 32)$
- Step 4 : Print C
- Step 5 : End.



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In most P. Lang. The lamp → repetition etc.

comp program is a collection of instructions that perform a specific task when executed by

- program :—
  - comp. program is a collection of instructions that performs a specific task when executed by a comp.
- \* features constitute a gd lang.

- clarity, simplicity, economy of lang
- clarity of program
- naturalness of application.
- support for abstraction.
- cost of use.
- probability of progress.

→ Types of controls :-

The branch  $\rightarrow$  a binary decision

based on some condition. If the condition is false, the other alternative is taken. If the condition is true, 1 of 2 branches is executed.

The loop allows a ~~statement~~

to be repeatedly excited based  
on some local condition  
represented by 'cyclic copies' constructed

→ Definitions = each step of user (A) must be precisely defined. It's done by well thought actions to be performed at each step of (A).

3) Input = any operation you perform associated some beginning value associated with diff activities in operations.

4) Output = always expects o/p in form of output from user (A).

5) Effectiveness = A) to be developed using basic operations.

→ Adv of F.C

→ Adv of P-charts

1) Communication = F.C ease bottles away of communicating the logic of a system to all concerned.

2) Effective analysis = F.C problem can be analyzed in more effective way.

3) Proper documentation = program f.c leaves a gel program documentation.

4) Efficient coding = F.C act as a guide during the system analysis.

→ prog development phase.

5) proper debugging = efficient program maintenance = it help program to put efforts more efficiently on that part.

6) alterations = modifications = If alterations are required the F.C

may require reworking completely.  
3) Reduction = as F.C symbols cannot be typed, reproduction at F.C becomes a problem.

4) The versatility of what is done can easily be lost in technical details of how it is done.