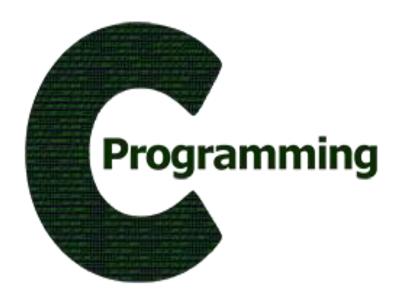


CSE101 Computer Programming

Lecture #0



Course Details



- LTP
 - 2 0 2

- Text Book
 - "PROGRAMMING IN C"

by

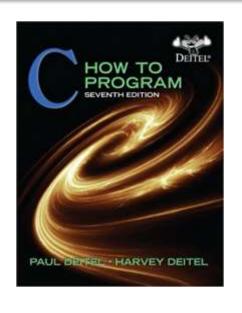
ASHOK N. KAMTHANE

PEARSON, 2nd Edition

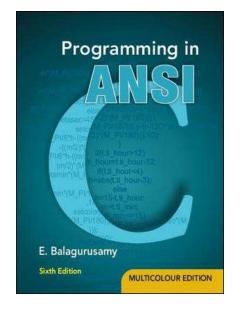
Reference Books



 "C HOW TO PROGRAM" by PAUL DEITEL AND HARVEY DEITEL
 PHI(Prentice Hall India)

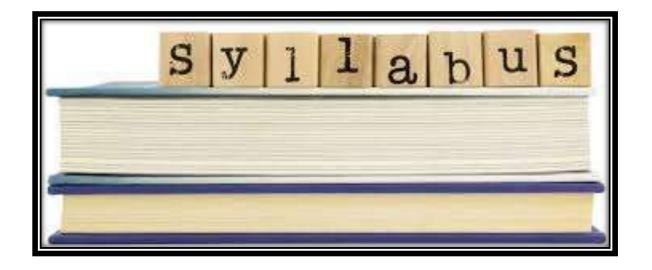


• "PROGRAMMING IN ANSI C"
By E. BALAGURUSAMY
McGraw Hill Education



Syllabus and Instruction Plan(IP)







Course Assessment Model



Marks break up

Attendance	5
Academic Task	25

- MTE 20
- ETE 50
- Total 100

Academic Task



Component	Week
-----------	------

- 1. Online Assignment 3 5th
- 2. Online Assignment 2 9th
- 3. Online Assignment 3

Total Weeks: 14(7 Before MTE and 7 After MTE)

Mode of Conduct



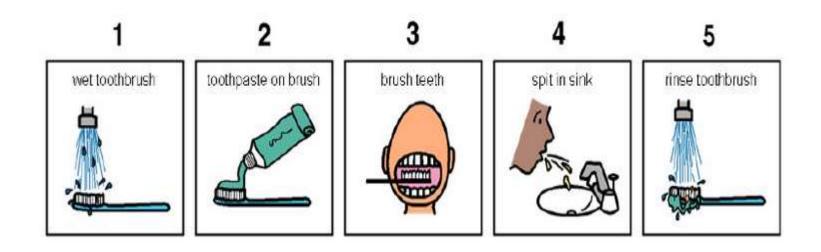
• BYOD(Bring your own device)

• Note: Laptops are mandatory for program implementation.



Let us look around our daily routine...

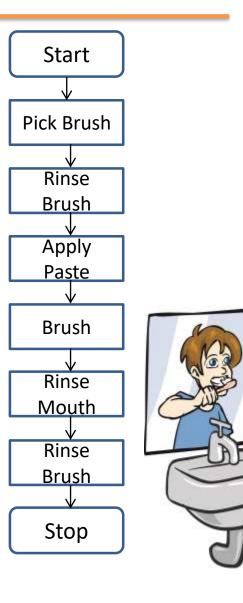
- Let us see where all we do programming everyday
- Simple things we do to start the day



So there is ONE program you know which is there in you... © LPU :: CSE101 C Programming



- There is a set procedure
- Each step is defined
- The occurrence is ordered
- Jump is NOT permitted
- A step cannot be skipped





Let us explore more as the day goes by...



Going for a morning 0900 AM Class

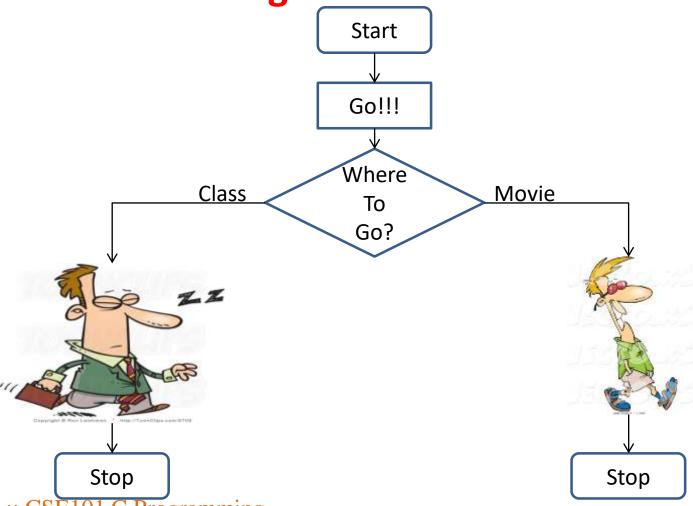


Going for a movie at 0900 AM

It is all about WHICH program is loaded WHEN



The flow changes



So what does this mean?



- Take ANY activity of the day...
- It will have a set procedure
- It has to be done in a designate way
- If not done the specified way will yield wrong results
- Success in doing it depends on how closer one is to the prescribed method
- This clearly shows that everything has a







What next?



- If there is logic in anything and everything
- There has to be ways to represent logic
- There has to be modes to modify and re-represent logic
- There should be methodology to implement and re-design logic
- And for all this...

What next?



 There has to be logic machine to assimilate, understand, solve, store, retrieve and represent logic



There has to be a
 LANGUAGE to communicate with the logic machine
 Otherwise....



Diving deeper...





WHY C?????????????













➤ If we have number of powerful programming languages available with us then why c??????









The hitch.....



Some burning questions in mind.....

- C is a very old language. Why are we still studying this language??????
- Now, we have very powerful languages with us then, why c??
- There is no scope of this language in industry





Lets take you close to the reality



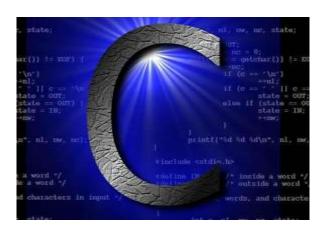
- All of us use Computers or Laptops for different purposes.
- Could you tell me which system software is most required to get our system in working mode??????



Let's Explore more



• Could you tell me which programming language is used in writing all these operating system??????





• Latest version of Microsoft Windows i.e. Windows 10 is still being written in C Language





Contd.....



- Device drivers are also written in C language.
- All these modern programming languages are influenced by C language













• Compilers for Python and PHP language are also written in C language

Contd.....



• Embedded systems are also developed with the help of C language





Contd.....



•Git





•Oracle Database Sun



·Linux

•Unix



Android



•Google



MNCs



Top rated Companies which has a dearth of C programmers



Here are the Answers of Questions PROFESSIONAL UNIVERSITY

• C is very a old language still, why do we study C language??

• Now, we have very powerful languages with us then why c??



There is no scope of this language in industry
 https://www.youtube.com/watch?
 v=CYvJPra7Ebk

History of C



- Dennis Ritchie and Ken Thompson were working on developing a new operating system i.e UNIX
- But the programming language they were using was not providing them the portability feature
- So Dennis Ritchie developed new language i.e C



History continued...



Su	Summary -		
1	B Language Developed By	Ken Thompson	
2	Operating System Developed in C	UNIX	
3	Developed at	AT & T Bell Laboratory	
4	Creator of Traditional C	Dennis Ritchie	
5	Year	1972	

Why "C" name was given???



- Many of C's principles and ideas were derived from the earlier language B. (Ken Thompson was the developer of B Language.)
- BCPL and CPL are the earlier ancestors of B Language
- CPL is Combined Programming Language. In 1967, BCPL Language (Basic CPL) was created as a scaled down version of CPL
- As many of the features were derived from "B' Language thats why it was named as "C".
- After 7-8 years C++ came into existence which was first example of object oriented programming.

Evolution of C...





Language Developers



Algol	International Group
BCPL	Martin Richards
В	Ken Thomson
Traditional C	Dennis Ritchie
K&R C	kernighan & Ritchie
ANSIC	ANSI Commitee
ANSI/ISO C	ISO Commitee
C99	Standerd Commitee

Features of C Language



- Low Level Language Support
- Program Portability
- Powerful and Feature rich
- High Level Features
- Modular Programming

It can be defined by the following ways:

- Mother language
- System programming language
- Procedure-oriented programming language
- Structured programming language
- Mid-level programming language

Course Contents



Before MTE

- ✓ Data Types & Operators
- ✓ Control Structures
- ✓ User Defined Functions
- ✓ Storage Classes

After MTE

- ✓ Arrays and Strings
- ✓ Pointers
- ✓ Dynamic Memory Allocation
- ✓ Derived Data Types- Structures and Union

Tools



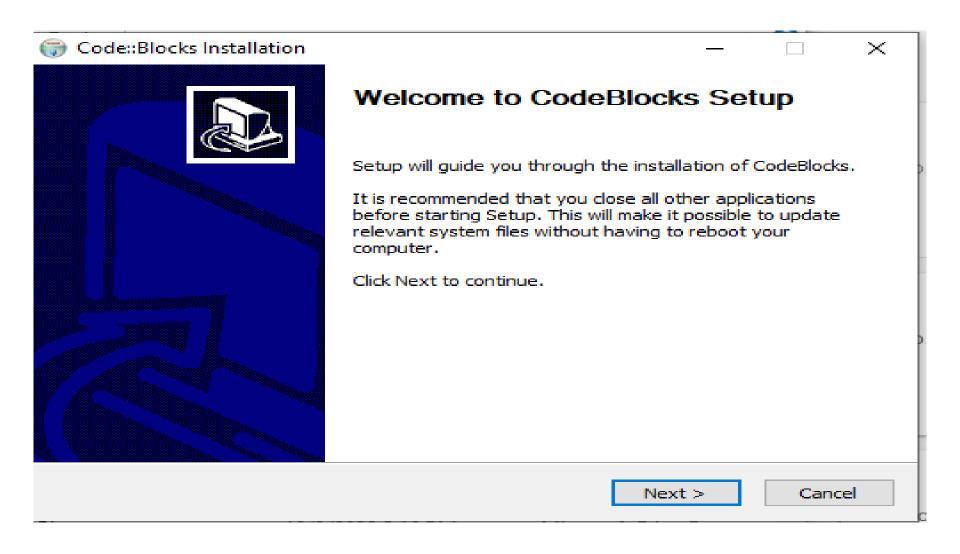
Offline Compiler Code Blocks:

http://www.codeblocks.org/downloads

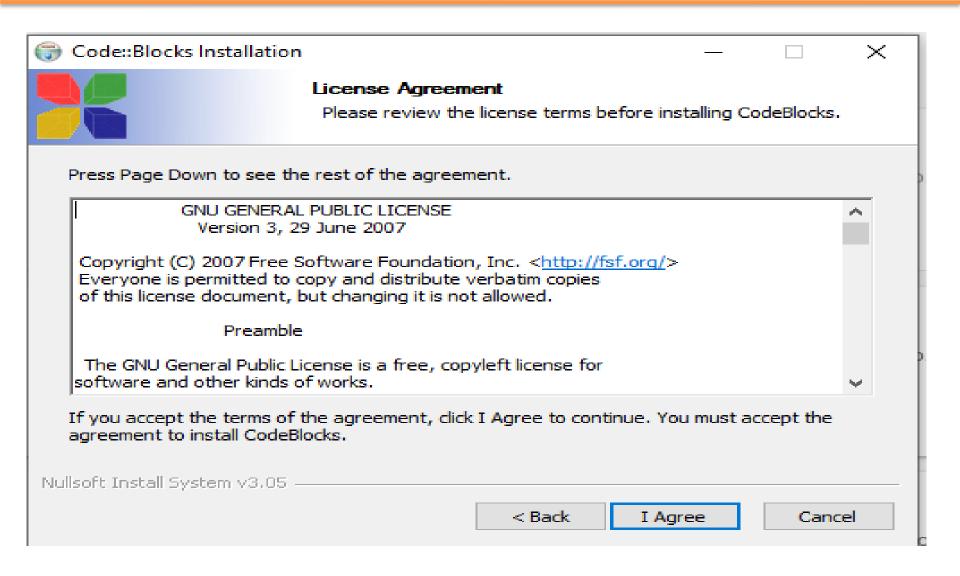
Online compiler CPP shell:

http://cpp.sh/

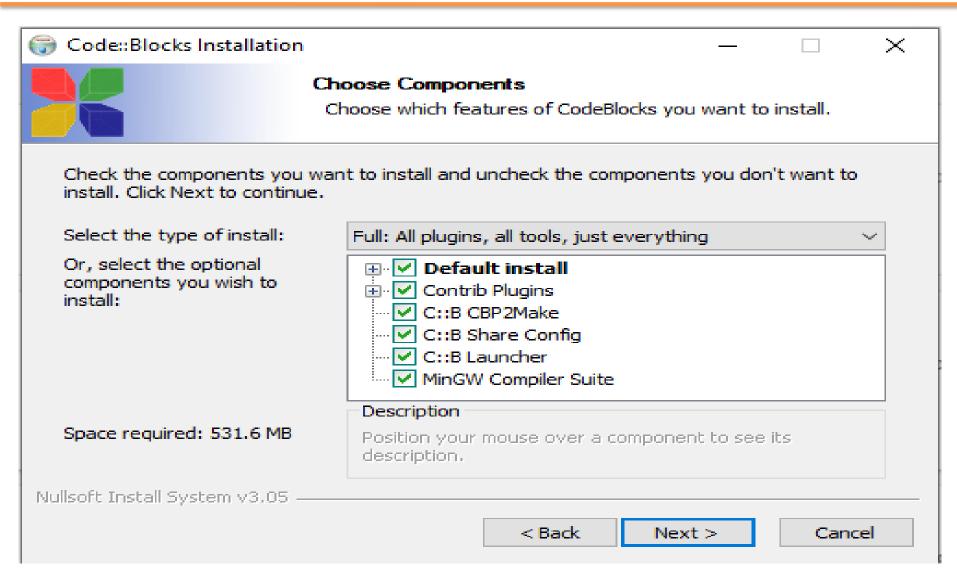




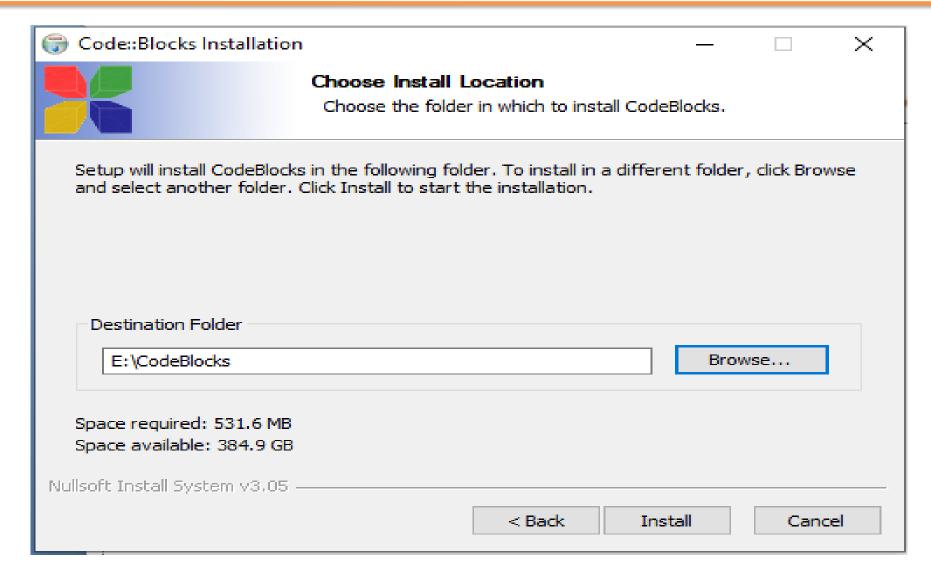






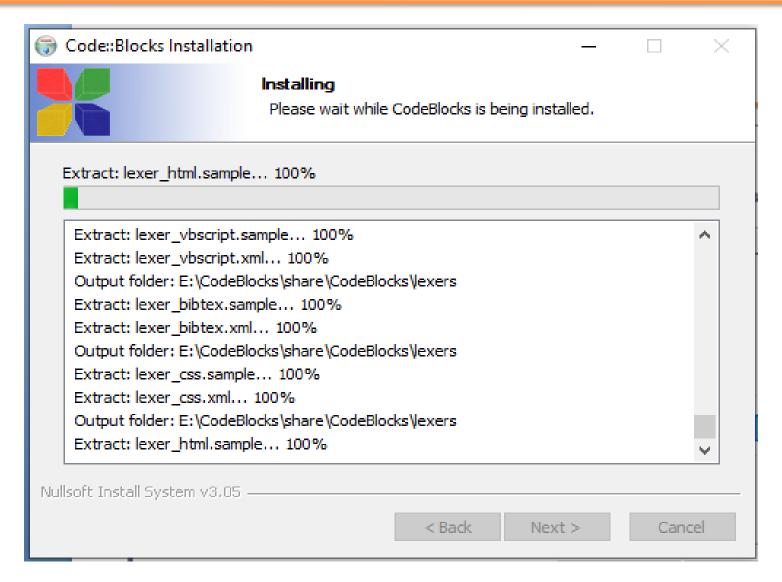






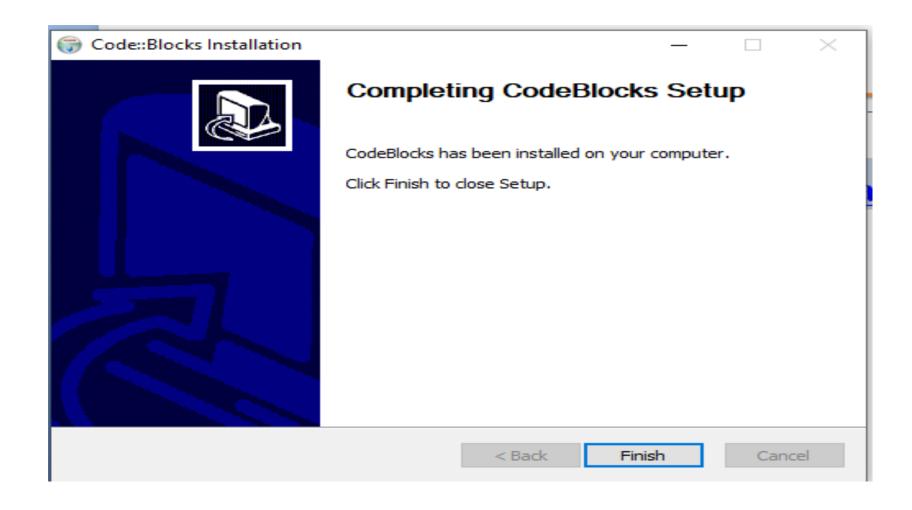
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MCQ



- Q1 Who is the father of C language?
- a) Bjarne Stroustrup
- b) James A. Gosling
- c) Dennis Ritchie
- d) Dr. E.F Codd

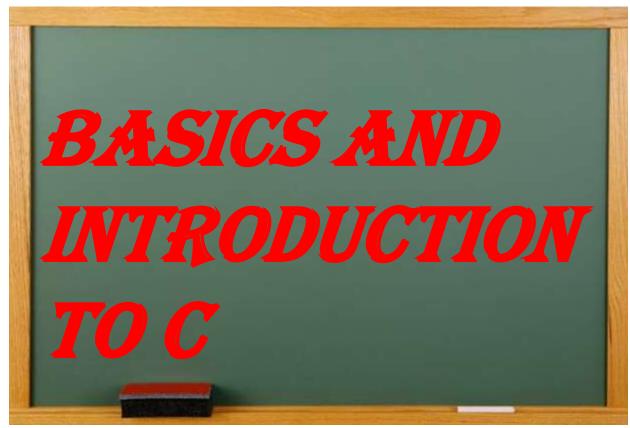
MCQ



- Q2 C was primarily developed as?
- a) System Programming Language
- b) General Purpose Language
- c) Data Processing Language
- d) None of the above







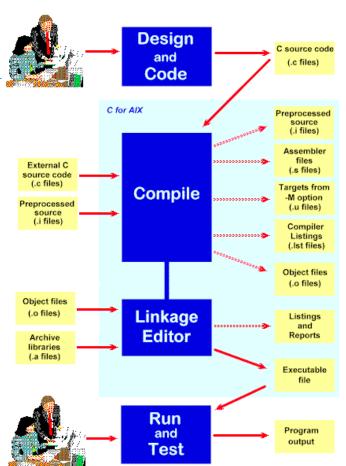


CSE101-Lec 1

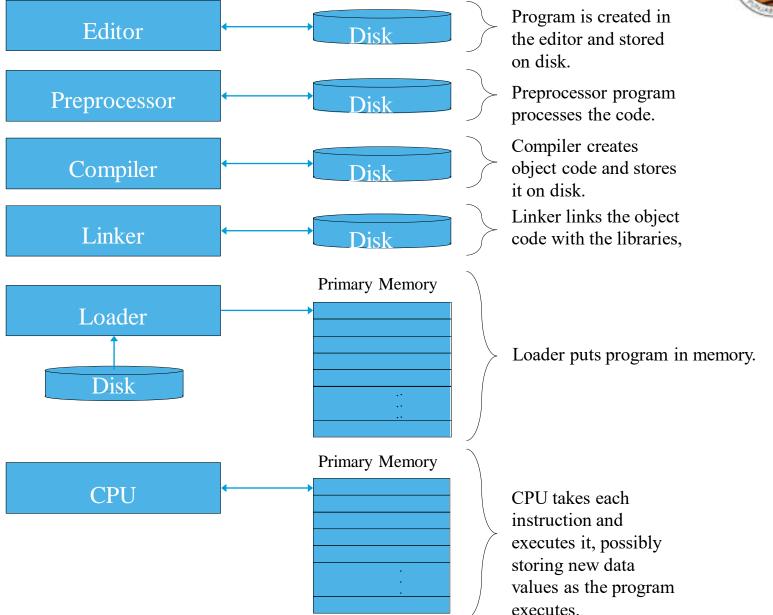
C Program Development Environment

C Program Development Environment

- A C program must go through various phases such as:
 - 1. Creating a program with editor
 - 2. Execution of preprocessor program
 - 3. Compilation
 - 4. Linking
 - 5. Loading
 - 6. Executing









C Program Development Environment(cont.)

Phase 1: Create your program with an **editor** program



Phase 2: A preprocessor find some preprocessor directives (#include <stdio.h>) to include other files.



Phase 3: Compiler compiles the program into machine languages



Phase 6: CPU executes the program one instruction at a time. The load process in Windows OS is just input the name of the executable file.



Phase 5: A **loade**r loads the executable image into memory (RAM).



Phase 4: A linker links the object code with the code in library or other places to produce an executable image.



MCQ

- C programs are converted into machine language with the help of
- a) An editor
- b) A compiler
- c) An operating system
- d) An interpreter





Next Class: Program structure of C program. Various programming tools like flow chart and algorithms.



CSE101-Lec 2

Program structure of C program.

Various programming tools like flow chart and algorithms.



Algorithm

- Algorithm is defined as "the finite set of steps, which provide a chain of action for solving a problem"
- It is step by step solution to given problem.
- Well organized, pre-arranged and defined textual computational module

Characteristics of good Algorithm

- 1. Correctness terminates on ALL inputs (even invalid inputs!) and outputs the correct answer.
- 2. Simplicity each step of the algorithm performs one logical step in solving the problem.
- **3. Precision** each step of the algorithm is unambiguous in meaning.
- **4. Comprehensibility** the algorithm is easy to read and understand.
- **5. Abstraction** presents the solution steps precisely and concisely without referring to low-level (program code) details.
- 6. **Efficient** Gives results rapidly based on the problem size; does not waste any space or time.
- Easy to Implement relatively easy to translate into a programming language.

Steps to create an Algorithm

- 1. Identify the Inputs
- What data do I need?
- How will I get the data?
- In what format will the data be?

- 2. Identify the Outputs
- What outputs do I need to return to the user?
- What format should the outputs take?

Steps to create an Algorithm

- 3. Identify the Processes
- How can I manipulate data to produce meaningful results?
- Data vs. Information

4. Break the Solution to steps

By breaking the solution to the steps we can easily understand the logic of program



Example of Algorithm

To establish a telephone communication

- Step 1: Dial a phone number
- Step 2: Phone rings at the called party
- Step 3: Caller waits for the response
- Step 4: Called party picks up the phone
- Step 5: Conversation begins between them
- Step 6: After the conversation, both disconnect the call

Algorithm: Add 2 Numbers

Problem: To add two numbers.

- Step1. Start.
- Step2. Take the two numbers.
- Step3. Add them.
- Step4. Print the result.
- Step5. Stop.

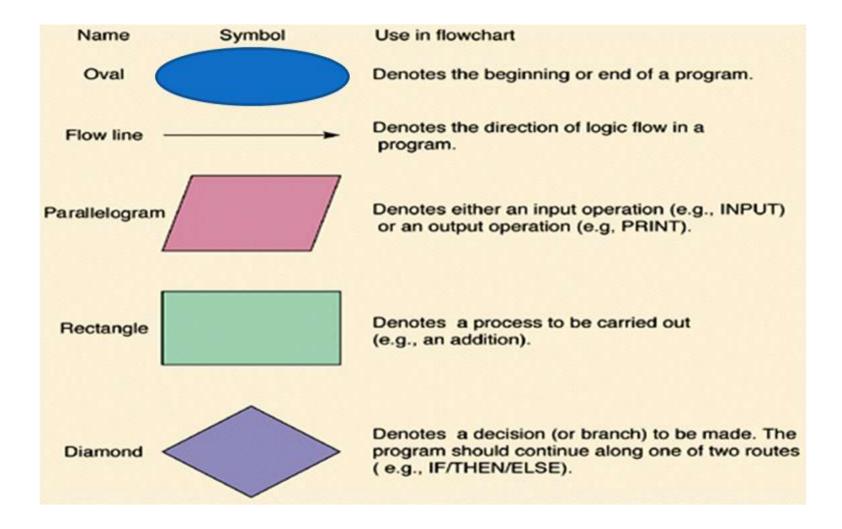


Flow Chart

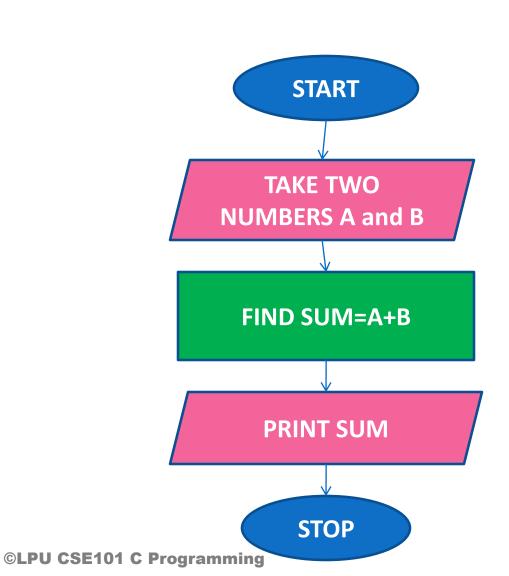
- Flow Chart is pictorial representation of an algorithm.
- Whatever we have done in algorithm we can represent it in picture.
- It is easy to understand.
- Shows the flow of the instruction



Flow Chart Symbols

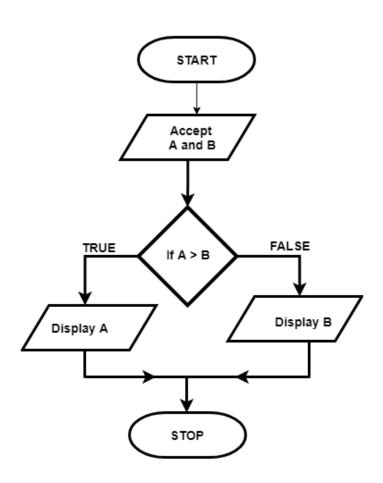


Flow Chart: Add 2 Numbers





Flow Chart: Greater than two Numbers





Pseudocode

- pseudocode statements that appear to have been written in a computer programming language but do not necessarily follow any syntax rules of any specific language.
- The purpose of using pseudocode is that it is easier for people to understand than conventional programming language code, and that it is an efficient and environmentindependent description of the key principles of an algorithm.



Example of Pseudocode

start
 input myNumber
 set myAnswer = myNumber * 2
 output myAnswer
 Stop



MCQ

Q1 The symbol

denotes _____

- a) I/O
- b) Flow
- c) Terminal
- d) Decision



MCQ

- Q2 In computer science, algorithm refers to a pictorial representation of a flowchart.
 - a) True
 - b) False



Explanation

- A simple C program consists of
 - Comments (optional)
 - ///*...*/
 - Including header files
 - #include<header file name>
 - Functions
 - main function as special function
 - Other user defined functions (optional)
- Let's discuss these in detail...



Comments

//Problem 1.1: If the price of one kg mango is 45 Rs. then find the price //of 7.5 kg mangoes.

- Two forward slashes ' // ' (double forward slashes), are used to write single line comment
- The next combination '/*....*/' (forward slash with asterisk) is used for commenting multiple lines
- These comments are not being executed by compiler
- * comment can appear anywhere in a program where a white space can appear



Header files

- The next two lines are command for including header files
- #include<stdio.h> // including stdio.h header file #include<conio.h> // includeing conio.h header file
 - These two lines must be included in every C program
 - stdio.h: standard input output header file for functions printf(),scanf(),... and so on
 - conio.h: console input output header file for functions getch().... and so on
 - Here '#' is called preprocessor directive



Header files

C code example

Program



```
//Sample program
#include<stdio.h> //header file for printf()
#include<conio.h> //header file for getch()
int main()
{
    //stdio.h is providing printf() function
    printf("Car is under process");
    //conio.h is providing getch() function
    getch();
}
```

Output:

Car is under process





Next Class: Components of C Identifier and Keywords Data Type

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