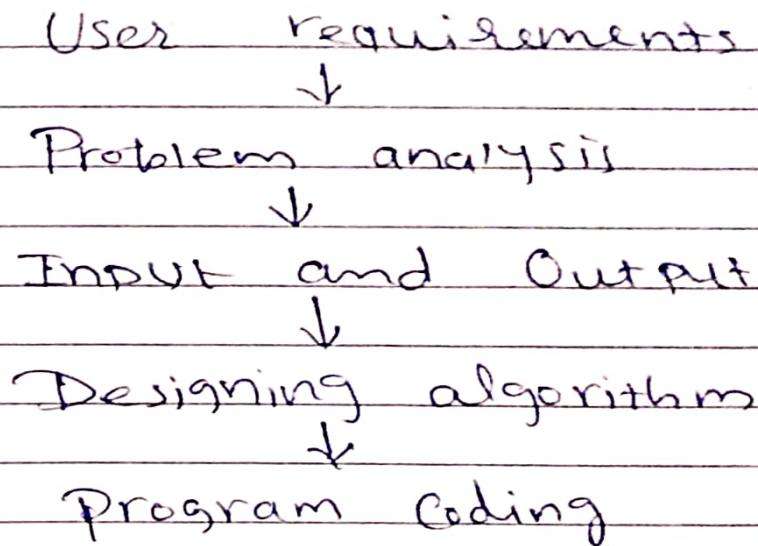# Introduction to C

- Software is a collection of programs
- Programs is a collection of instructions
- Software development

<div align="center">

User requirements

↓

Problem analysis

↓

Input and Output

↓

Designing algorithm

↓

Program Coding

</div>

* Process of Program development

Design Methods

Purpose of designing is to represent the solution for the system. Every system has several heierarchies of Components.

→ **Top - Down Design**
- top-level component represents the whole system.
- top-down design method starts from top-le[vel] component to lowest level (bottom) compone[nt]
- the system is divided into some major compe[nent]
- each major component is divided into lower-level components.

→ Bottom-up Design
- design method is the reverse of Top-down approach.
- It starts from the lowest level component to the highest-level component.

→ Modular Approach.
- It is better to divide a large system into modules.
- module is logically a well defined Part of program
- Each module is seperate part of program

* Characteristics of C
→ It is a middle level language.
→ It has the simplicity of high level language as well as power of low level language
→ This aspect of C makes it suitable for writing both application programs and system programs.
→ It has 32 keywords.

Structure of a C program

Comments
Preprocessors directives   # include
Global variables   ~~# define~~
main ( ) function
{

         local variables
         Statements
         - - - - -

}

func I ( )
{

         local variables
         Statements
         - - - -

}

Environment for c
   — Program Creation
   — Program compilation
   — Program execution.

(a)   Program creation

     — vi filename.c
     — file can be saved by Esc and
                             SHIFT + zz

(b) Program compilation

- cc filename.c
- if program contain methemetical fun^c
   cc filename.c   -lm

(c) Program execution

- a.out

② Elements of C

- character set
- Variables , data types, Constants,
- Keywords , expressions, statements

1. character Set
   - Alphabets
   - Digits
   - Special characters
   - + *) < > ({ [ ] : ? ! @ $ ~

2. Execution Characters | Escape Sequence

   - newline, tabs, backspace cannot be printed
   like other normal characters
   - C supports the combinations of
   backslash (\) and some characters
   from character set to print these
                                characters.

Meaning	Purpose	_/_/_
backspace	Moves the cursor to Previous Position	
bell (alert)	Generate a beep sound for alert	
carriage return	Moves the cursor to beginning of the current line	
new line	moves the " " " of the next line	
form feed	Moves the cursor to the initial Position of the next logical page	
null	Null	
vertical tab	Moves the cursor to the next Vertical tab Position	
Horizontal tab	moves the cursor to the next horizontal tab Position	
backslash	presents a charracter with backslash (\)	

Trigraph Characters

Delimiters

:	Colon	used for label
;	Semi colon	end of statement
( )	Parentheses	used in expression
[ ]	square brackets	used for array
{ }	curly braces	used for block of statement
#	hash	Preprocessor directive
,	Comma	variable delimiter