

## INTRODUCTION TO C

**C is a**

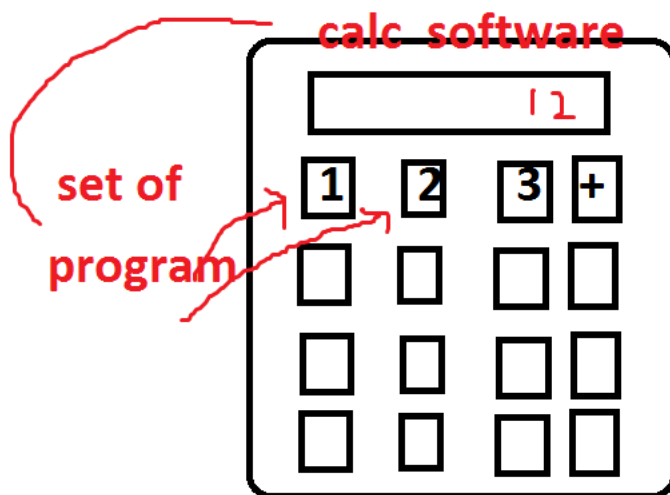
1. High level / middle level programming language.
2. It is a compiler based programming language.
3. It is a procedure oriented programming language [ POP ]
4. It is a general purpose / multi-purpose programming language.

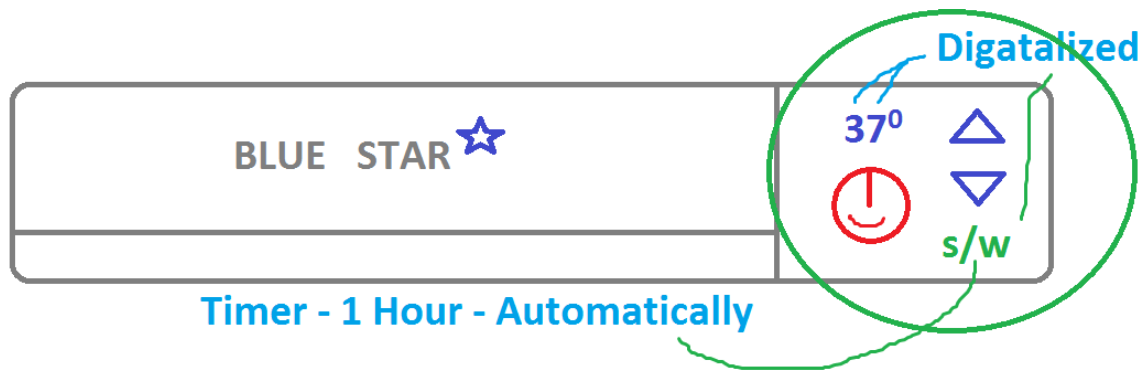
**What is a program?**

**Set of instructions is called program**

**What is a software?**

**Set of programs is called software. Or As per IT Industry software is a digitalized and automated process.**





Basically the software divided into 2 types.

**1. System software**

Eg: operating system, device drivers, translators

**2. Application software**

Eg: whatsapp, fb, phonepe,...

**What is a language?**

Generally the human languages like telugu, English, hindi, Marathi etc used to communicate with humans. But to communicate with the machines we have to the computer languages like C / C++ / Java / .Net / Py etc. by using these computer languages we can write the programs [ software ] to communicate the machines.

These languages basically divided into 3 types.

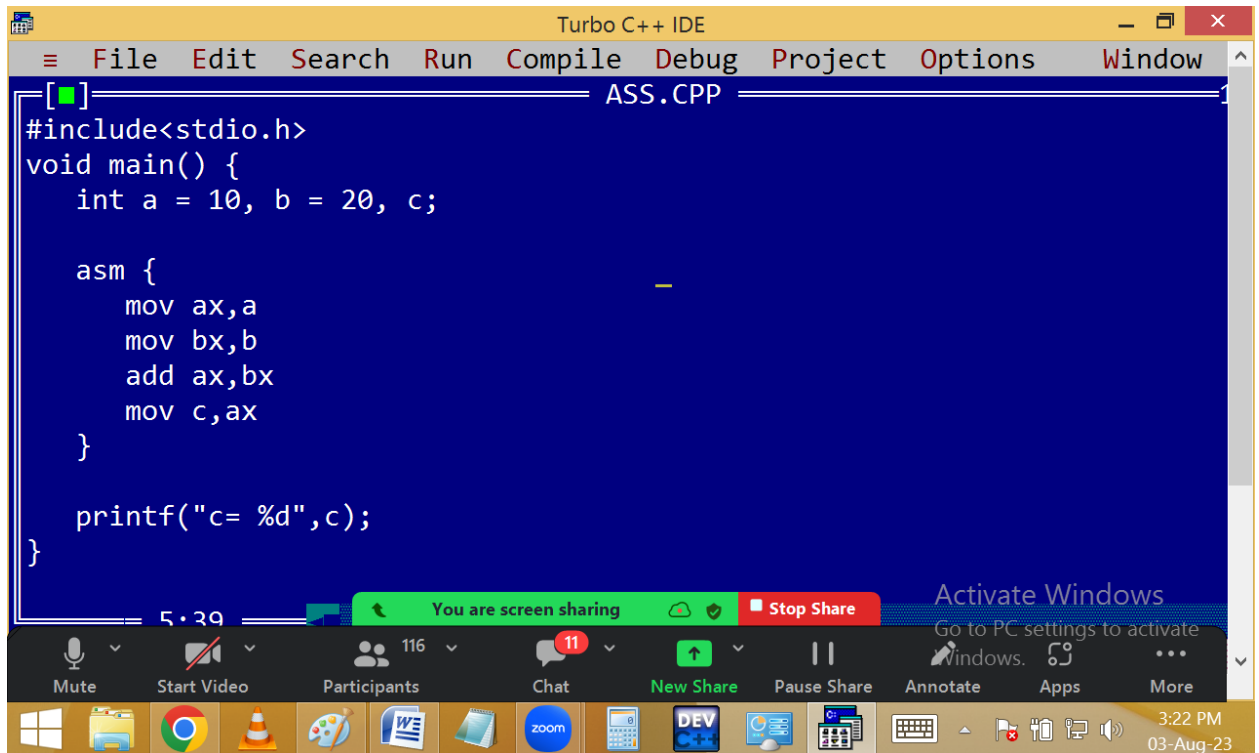
**1. Machine language: Created with binary code [0, 1]**

Eg: 10001111

## 2. Low level / assembly language: Created with English like shortcuts called MNEMONICS.

Eg: gd ngt, sub

Example:



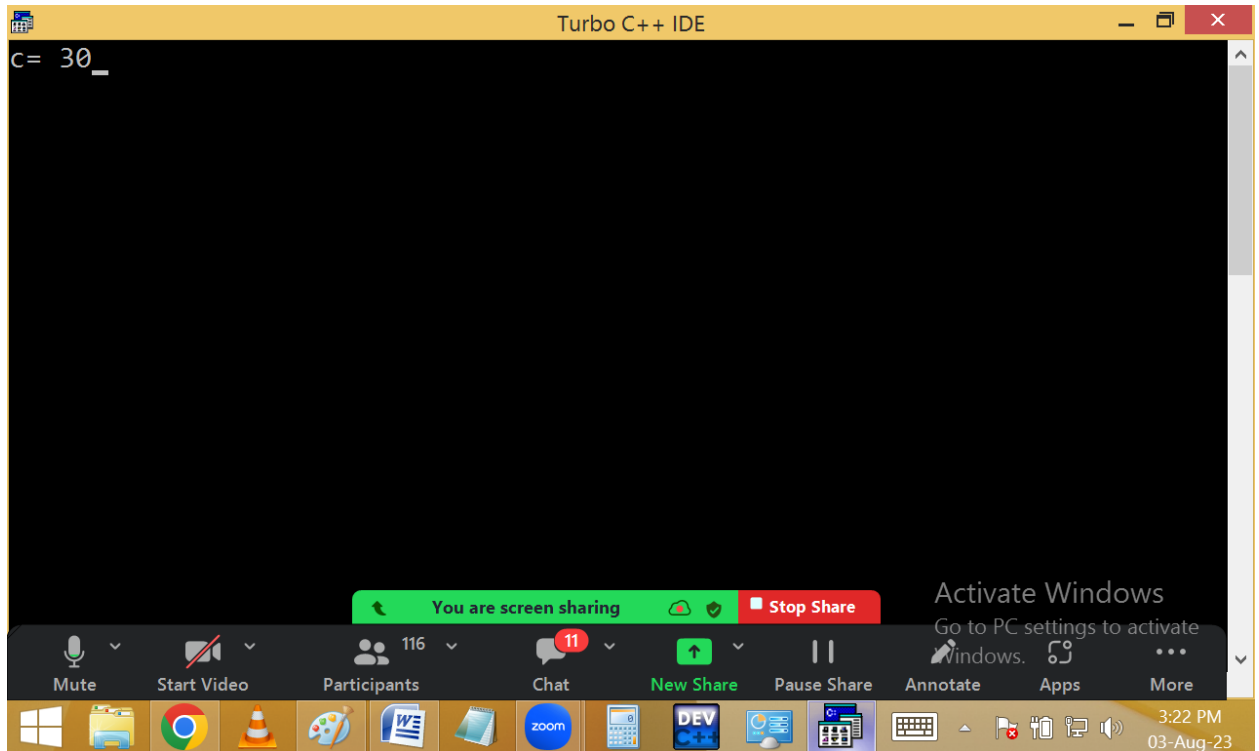
The screenshot shows the Turbo C++ IDE with a menu bar (File, Edit, Search, Run, Compile, Debug, Project, Options, Window) and a toolbar. The main window displays the file ASS.CPP with the following code:

```
[ ] ASS.CPP
#include<stdio.h>
void main() {
    int a = 10, b = 20, c;

    asm {
        mov ax,a
        mov bx,b
        add ax,bx
        mov c,ax
    }

    printf("c= %d",c);
}
```

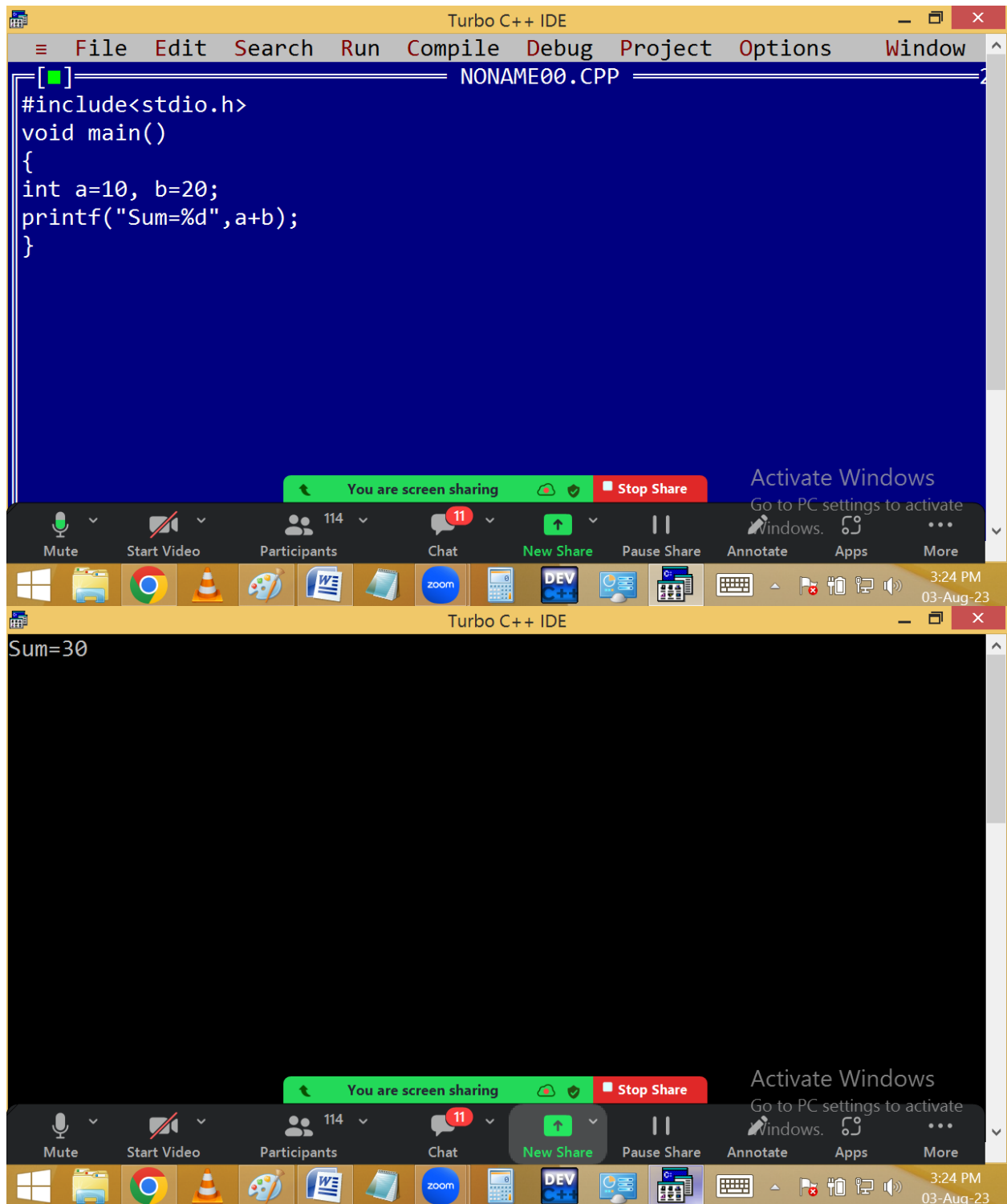
At the bottom, there is a Windows taskbar with various application icons (File Explorer, Chrome, VLC, Paint, Word, etc.) and a system tray showing the time as 3:22 PM on 03-Aug-23. A green banner at the bottom of the IDE window indicates "You are screen sharing" with a "Stop Share" button.



**3. High level language: Created with simple English. Hence easy to understand.**

**Eg: good night, subject**

**C is a high level language with low level features. Hence c is called it is a middle level language.**



**C high level features used to design application software and low level features used to develop system software. Hence C is multi-purpose language.**

## What is a translator?

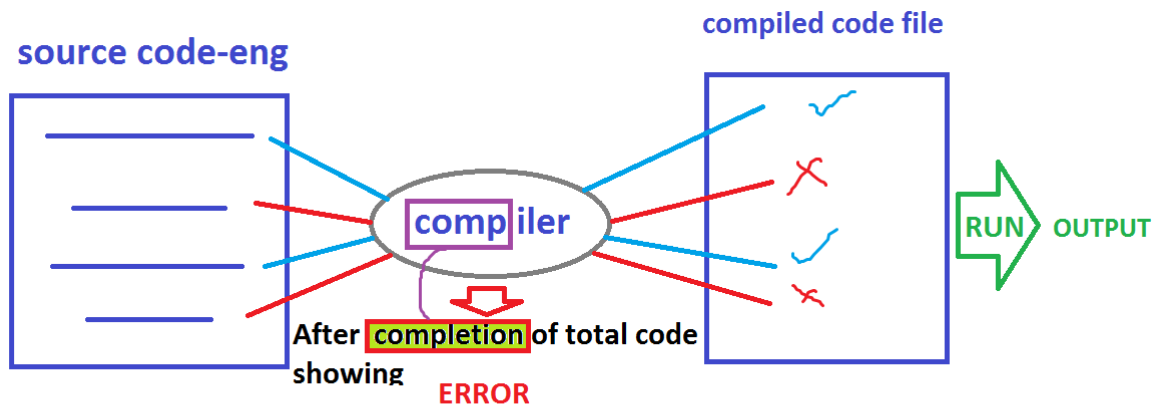


Always the user given instructions are in English, which is called source code / source program. But the computer understandable code is binary code / machine language. to convert this source code into binary code we are using the translators like

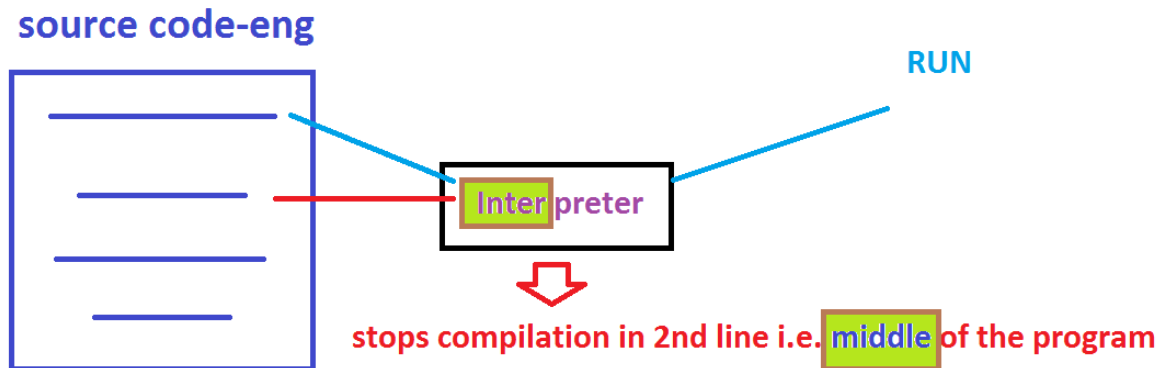
1. Compiler
2. Interpreter
3. Assembler

Compiler and interpreter used to convert high level programs to machine language.

Compiler completes the total source code at once by leaving error lines.



**Interpreter converts / checks the program line by line**



**Assembler used to convert assembly programs / low level programs to machine language.**

**Assembler working style is similar to compiler.**

**In C & C++ we are using compilers.**

**In Java / .net / Py we are using compiler with interpreter. Hence they are called compiler based interpreted languages.**

## **What is called programming paradigm?**

Every programming language follows certain structure with rules and regulations.

Before C language the languages are using monolithic programming structure. In this the whole program is created using single programs.

**Disadvantages:**

- 1. It is very difficult to find the erros.**
- 2. Takes more memory space.**
- 3. Low performance**
- 4. No reusability**



The image shows a screenshot of a Turbo C++ (TC) IDE window. The top menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 1 Col 38 Insert Indent Tab Fill Unindent \* E:NONAME.C'. The main editing area contains the following C code:

```
/* Example for monolithic program */
#include<stdio.h>
void main()
{
printf("-----\n");
printf("Good afternoon\n");
printf("-----\n");
printf("Welcome To C\n");
printf("-----\n");
printf("THANK YOU\n");
printf("-----\n");
}
```

Below the code editor, there is a Windows taskbar with various icons. Overlaid on the taskbar is a Zoom meeting control bar with buttons for Mute, Start Video, Participants (121), Chat, New Share, Pause Share, Annotate, Apps, and More. A green status bar above the taskbar says 'You are screen sharing' with a 'Stop Share' button. To the right of the taskbar, a message says 'Activate Windows Go to PC settings to activate Windows.' The system clock shows 3:03 PM on 04-Aug-23.

Below the taskbar, a separate window shows the output of the program. It displays the text:

```
-----
Good afternoon
-----
Welcome To C
-----
THANK YOU
-----
```

The output window also has a similar Zoom meeting control bar and system clock showing 3:04 PM on 04-Aug-23.

**In POP a big program divided into several small sub programs / sub routines / procedures / functions / structures / modules.**

**Hence c program is collection of procedures, it is called procedure oriented programming language.**

**Example:**

The image shows a screenshot of a Turbo C++ (TC) IDE window. The top menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 7 Col 28 Insert Indent Tab Fill Unindent \* E:PO.C'. The main editing area contains the following C code:

```
/* Example for POP program */
#include<stdio.h>
void line() /* function */
{
printf("-----\n")
}
void main() /* function */
{
line();
printf("Good afternoon\n");
line();
printf("Welcome To C\n");
line();
printf("THANK YOU\n");
line();
}
```

Below the code editor, a Windows taskbar is visible with various application icons. A green banner at the bottom of the IDE window states 'You are screen sharing' with a 'Stop Share' button. To the right, an 'Activate Windows' watermark is present.

The bottom portion of the image shows the output window of the TC IDE. It displays the output of the program:

```
-----
Good afternoon
-----
Welcome To C
-----
THANK YOU
-----
```

The output window also features a 'You are screen sharing' banner and an 'Activate Windows' watermark. The Windows taskbar at the bottom shows the time as 3:48 PM on 04-Aug-23.

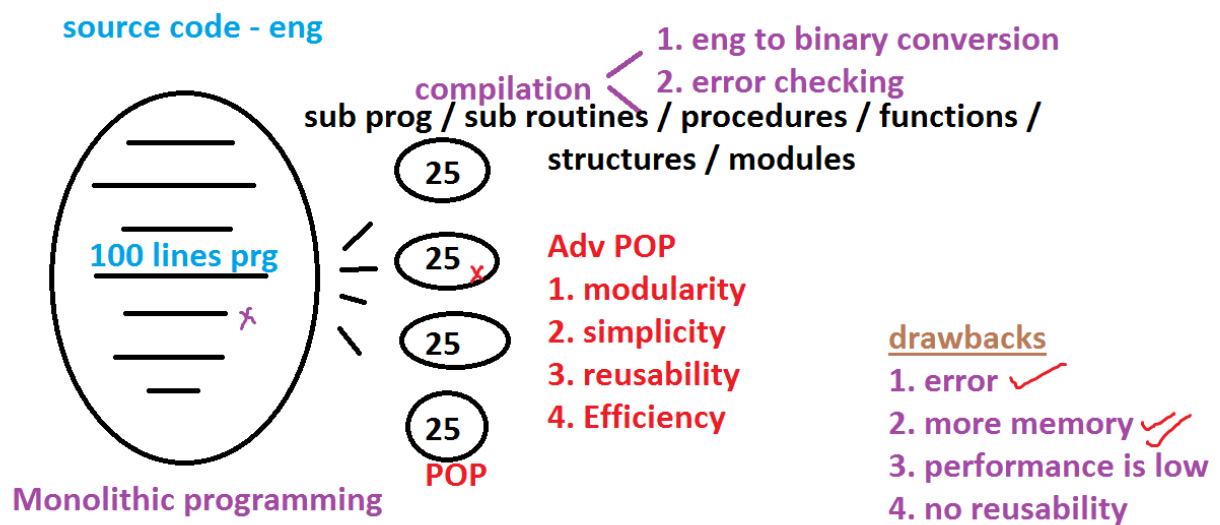
**Advantages:**

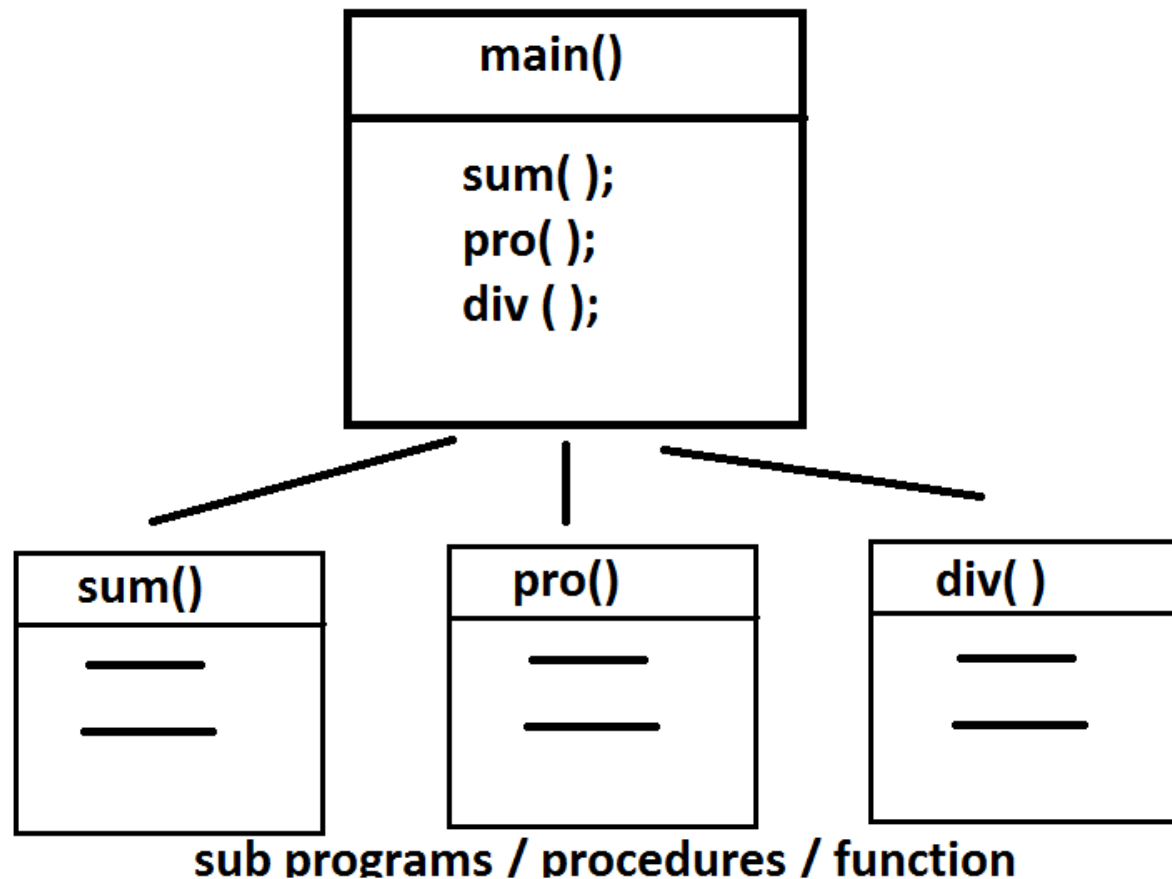
**Modularity:** Dividing big program in to small modules based on program requirement.

**Simplicity:** Easy to read the instructions.

**Reusability:** Write once, use many times.

**Efficiency:** Performance is high.





**Why C is general purpose / multi-purpose programming language?**

Using C language we can develop different type of software like

### **1. Operating system**

Eg: windows, unix, android, mac,...

### **2. Editors**

eg: Notepad, wordpad, Ms-Word, Edit,....

### **3. Translators**

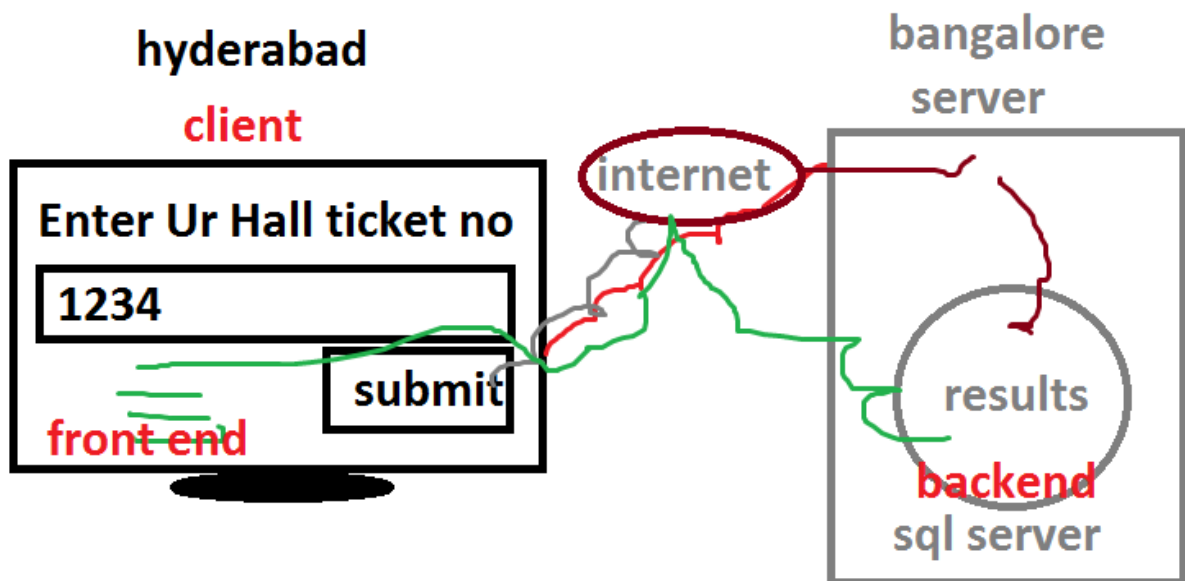
Eg: compiler, interpreter, assembler

#### 4. Commercial applications

Eg: Hotel / college / super market / atm,...

#### 5. Data base

Eg: oracle, sql server, my sql, dbII , Mongodb, SQLite,..



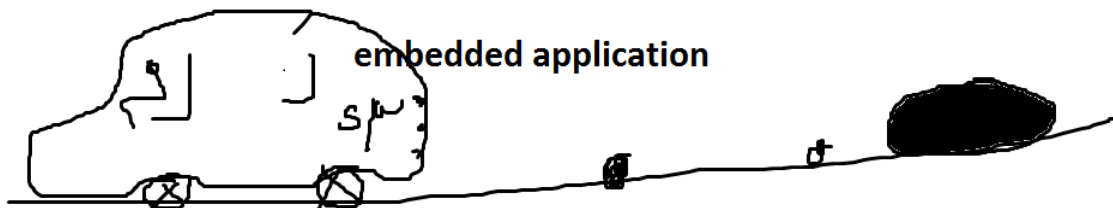
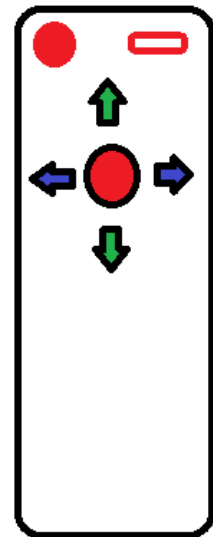
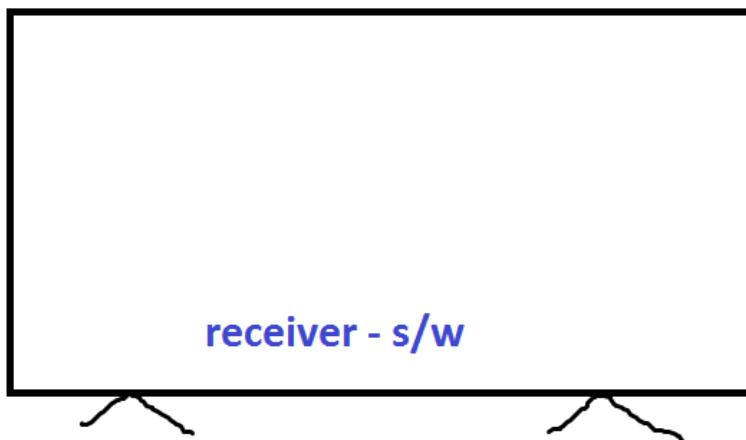
#### 6. Device drivers

Eg: audio / video / usb / printer drivers,.....



controlling the bus  
bus driver

## 7. Embedded applications



## **7. PC & Mobile games**

## **8. Antivirus**

Eg: quick heal, avast, Norton,....

## **9. Media players**

Eg: VLC , mx player, ...

## **10. Browsers**

Eg: chrome, firefox, edge,....

## **11. Stand alone applications**

Eg: ms-office, file manager, calculator,...

Hence C is also called it is a multi-purpose programming language.