INTRODUCTION TO C

C is a

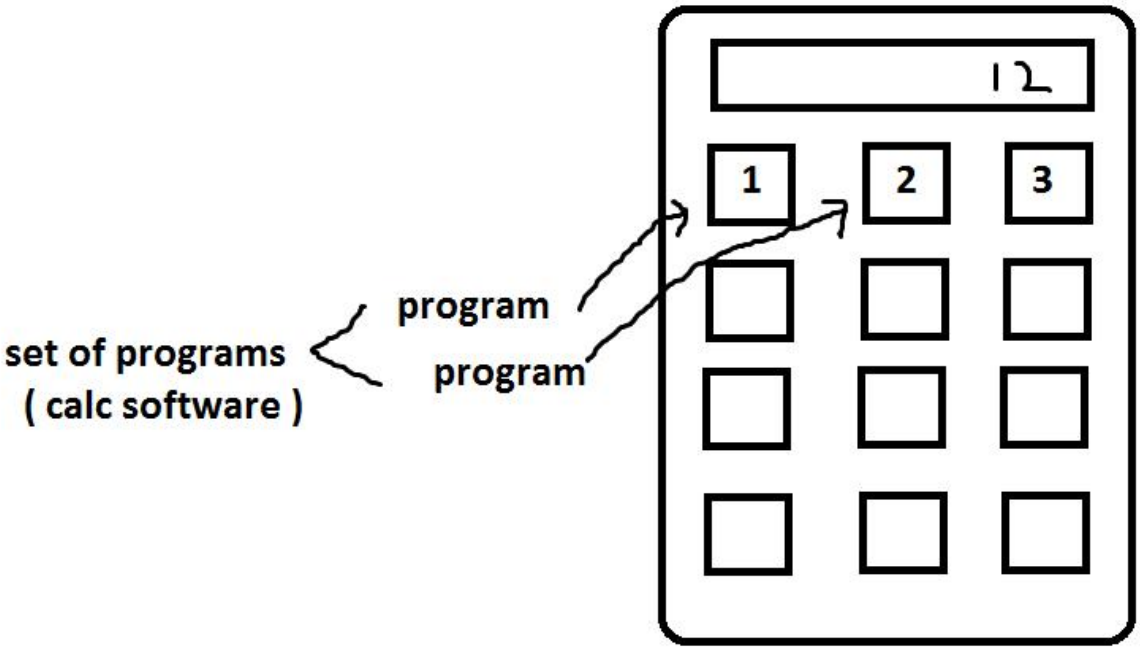
1. **High level / middle level programming language.**
2. **C is a compiler based programming language.**
3. **C is a procedure oriented programming language [POPs].**
4. **C is a general purpose programming language.**

What is a program?

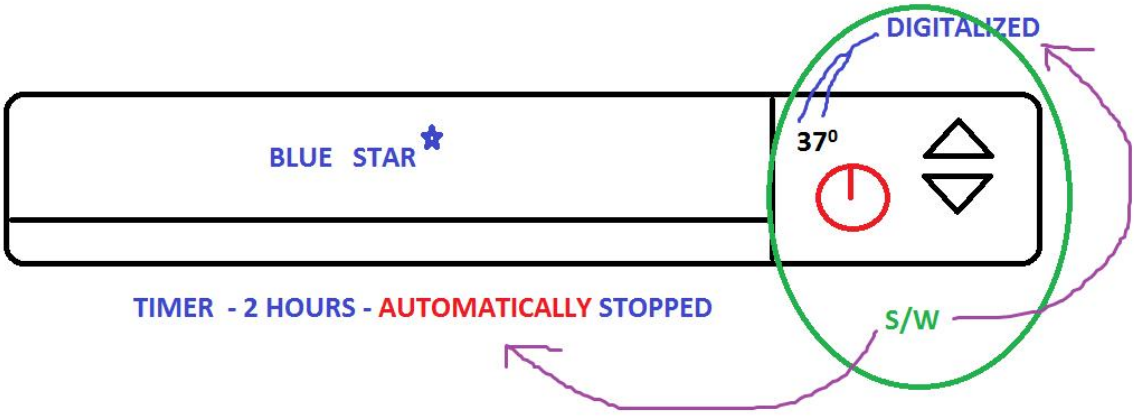
Set of instructions is called program.

What is a software?

Set of programs is called software.



As per IT Industry software is a digitalized and automated process.



We have two of software.

1. System software

   Eg: o.s, device drivers, translators

2. Application software

   Eg: whatsapp, phonepe, irctc,….

What is a language?

The languages are used to communicate with others. For example the languages like telugu / English / hindi / Marathi are called human languages and which are used to communicate with the humans. But to communicate with the machines we are using the programming languages like c / C++ / java / .net / python / go / R language etc. i.e. computer programming languages used to write the programs [software] to communicate with the machines.

Basically the computer languages are divided into 3 types.

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

   Eg: 11100010

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

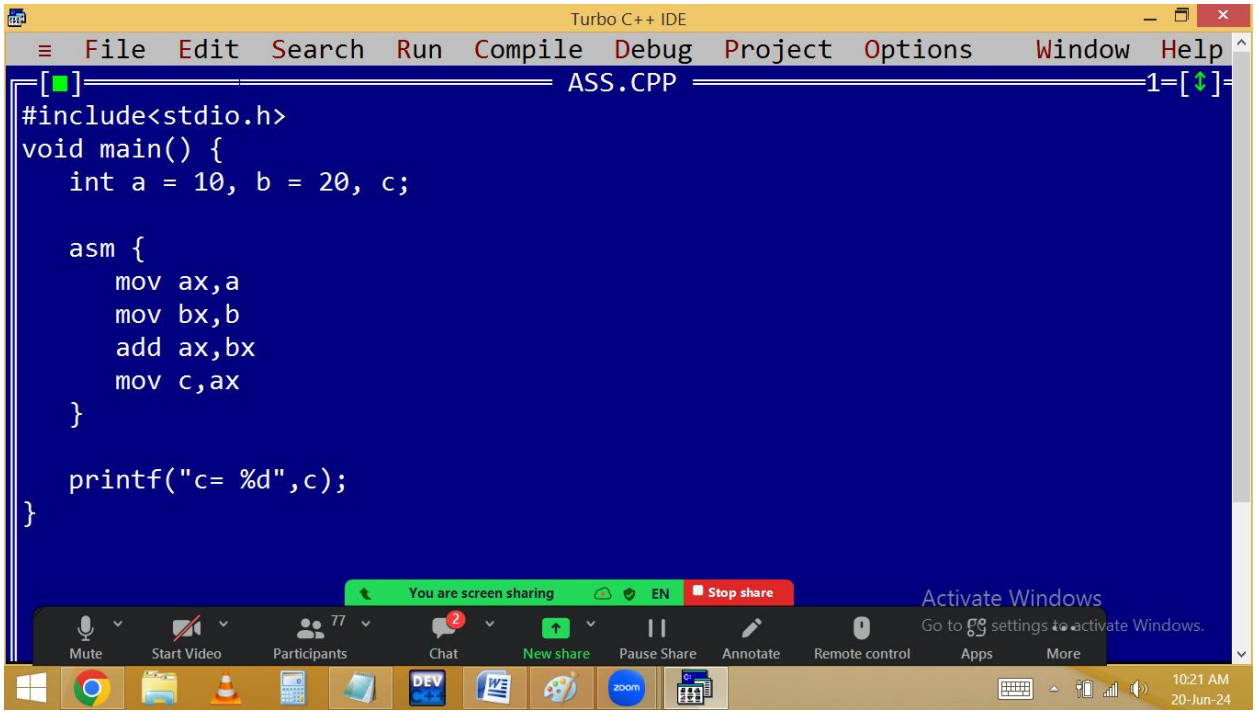
Eg: gd mrg, sub, add

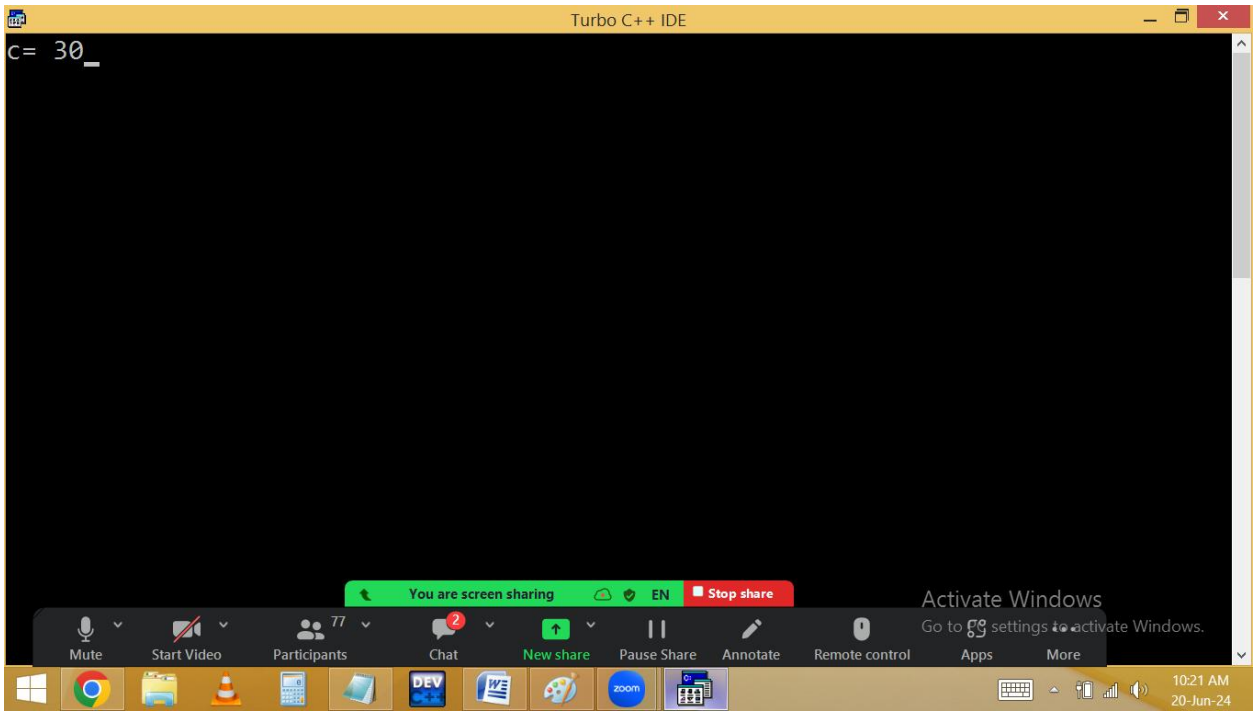
3. **High level language**: Created with simple english

Eg: good morning, subject, address

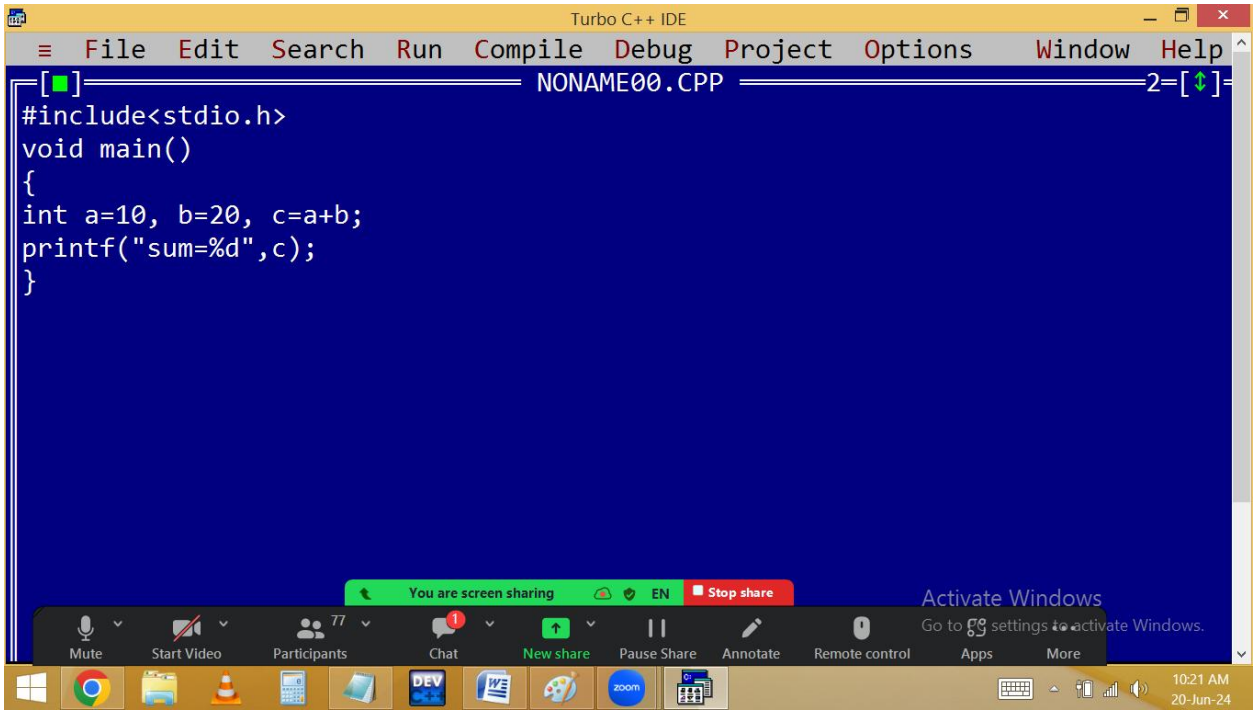
Low level programming example:

Adding of two numbers:





Example for high level programming:


Turbo C++ IDE
File Edit Search Run Compile Debug Project Options Window Help
NONAME00.CPP
#include<stdio.h>
void main()
{
int a=10, b=20, c=a+b;
printf("sum=%d",c);
}
You are screen sharing
EN
Stop share
Mute
Start Video
Participants
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Chat
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Annotate
Remote control
Apps
More
Activate Windows
Go to settings to activate Windows.
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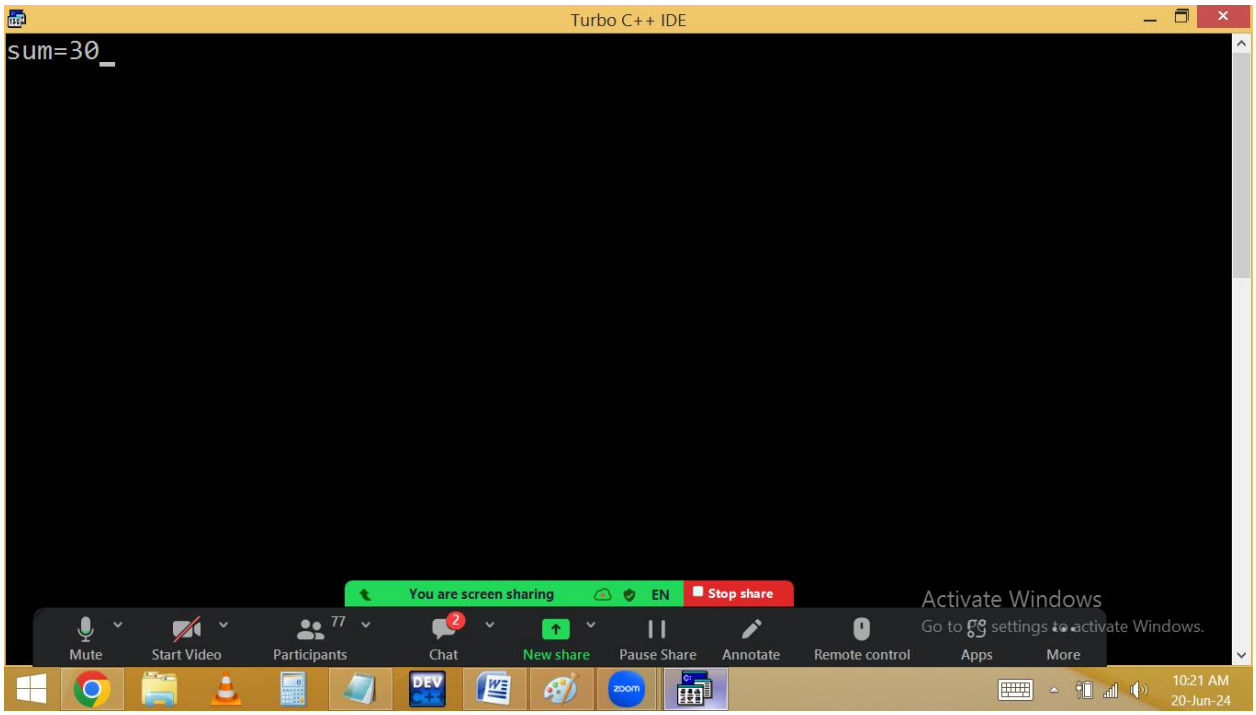
20-Jun-24


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

C low level features are used to develop the system software and high level features are used to develop application software. Hence c is called it is a multi-purpose programming language.

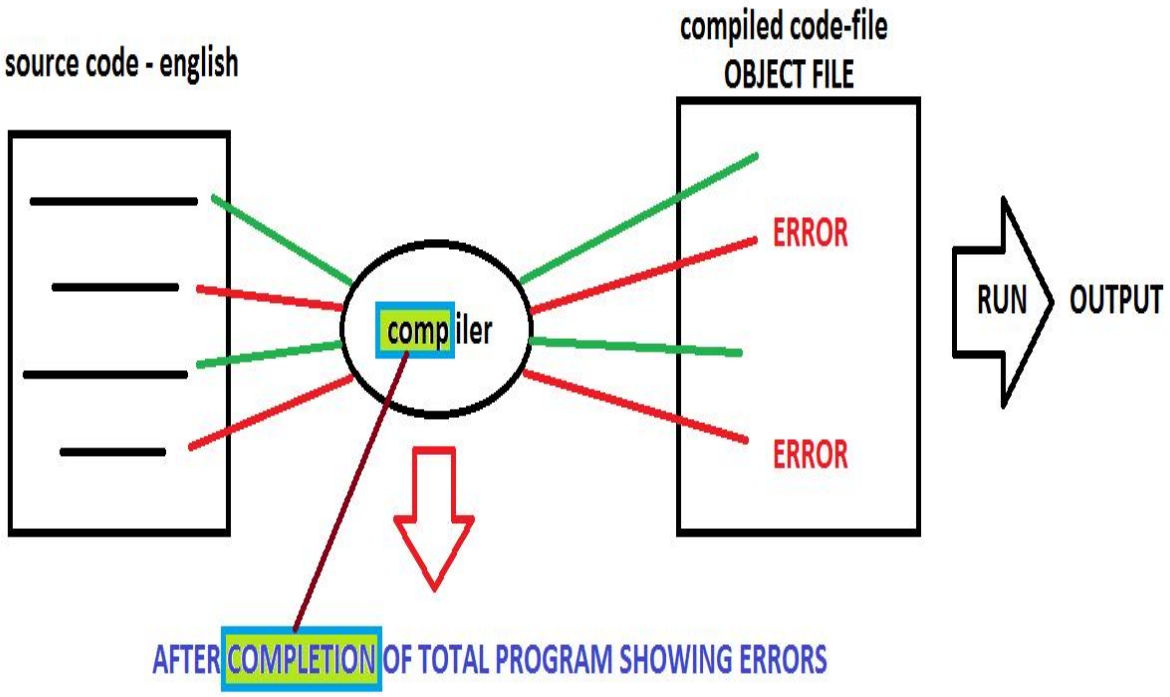
What is a translator?

Always the user [programmer] given instructions are in English, which is called source code / source program. But the computer is not able to understand the English. Due to this we have to convert this English code to binary code. For this we are using the translators like

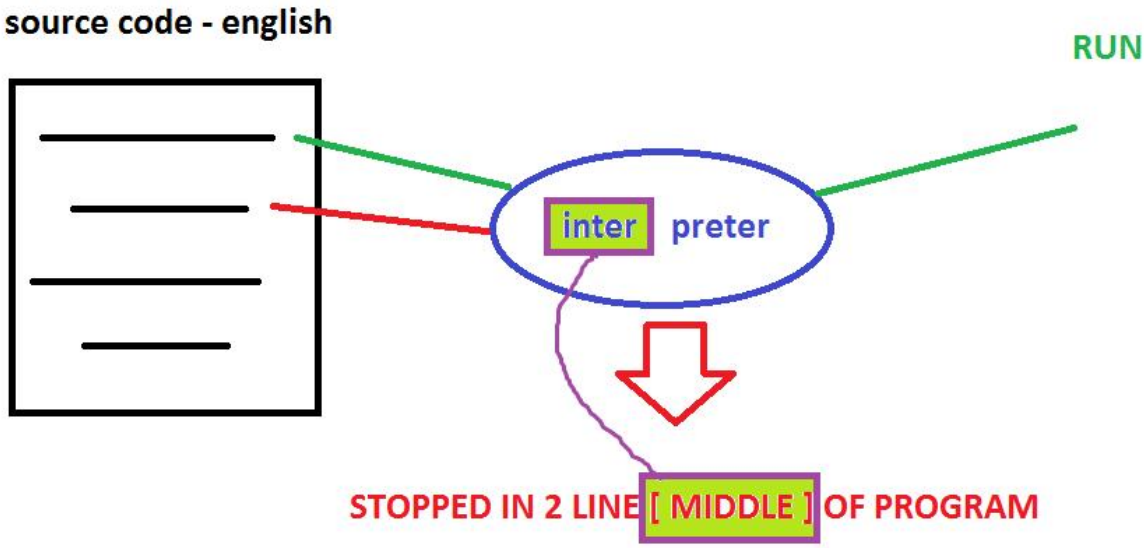
1. Compiler
2. Interpreter
3. Assembler

Compiler and interpreter used to convert high level programs to machine language [binary code].

Compiler converts the total program into binary code at once by leaving error lines.



Interpreter checks line by line.



Assembler is used to convert low level programs to binary code.

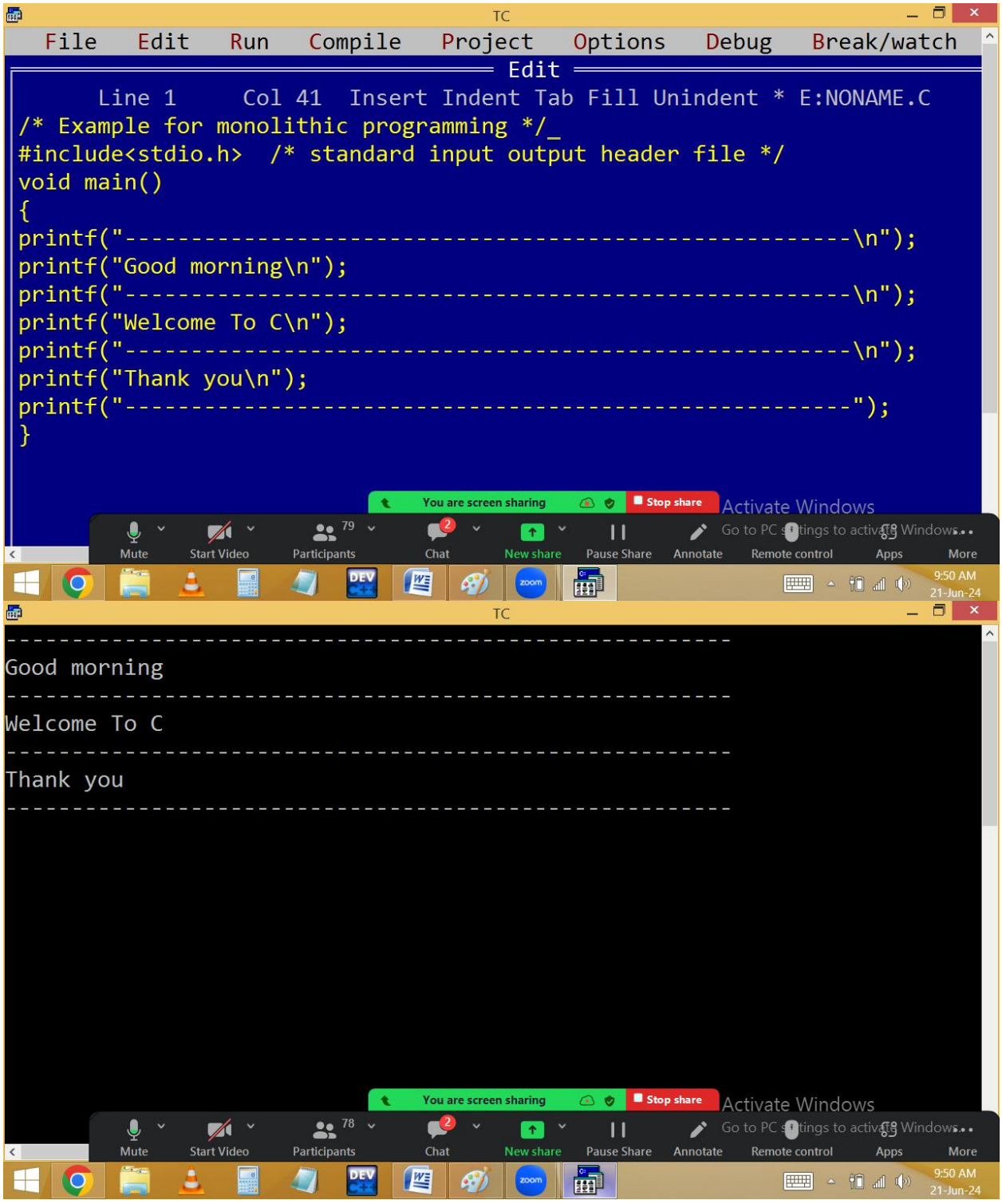
Assembler working style is similar to compiler.

In C & C++ we are using compilers. In Java / .net and python we are using compiler and interpreter. Hence they are called compiler based interpreted languages.

What is called programming paradigm?

Every programming language is having particular programming structure with rules and regulations, which is technically called programming paradigm.

Before C language we are having monolithic [single] programming paradigm. In this the whole application designed with single program. Due to this is very difficult to find the errors, it takes more memory and performance is poor. It doesn't allows the concept of reusability and allows only rewriting.



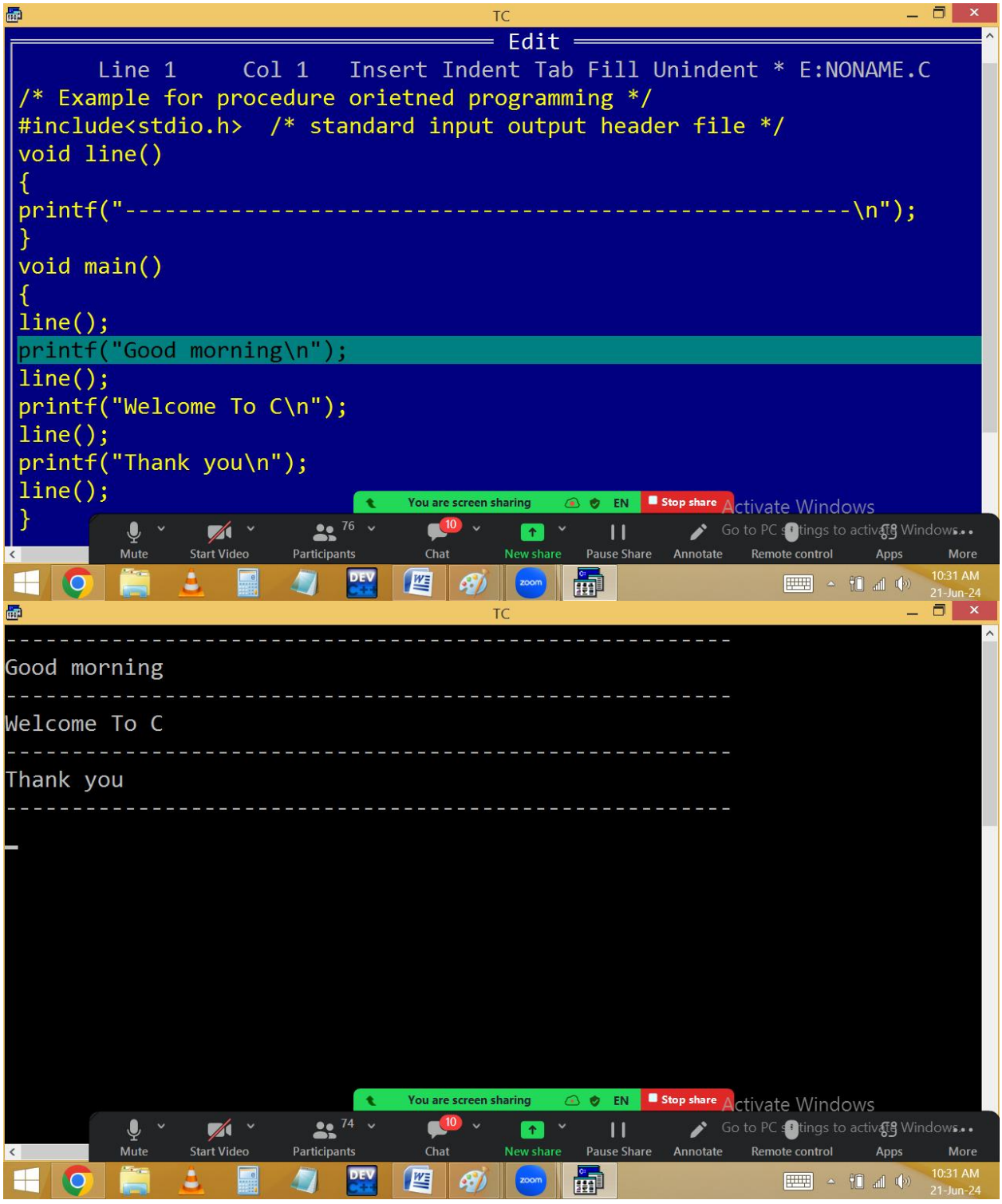
To avoid the problems in monolithic programming they have introduced procedure oriented

programming structure [POPs]. In this a big program is divided into several small sub programs / sub routines / procedures / functions / modules / structures. i.e. C program is collection of procedures, it is called POPs.

Advantages:

1. Modularity: Dividing a big program into small modules [pieces] according to the project requirement.
2. Simplicity: easy to read and understand.
3. Reusability: write once, use many times.
4. Efficiency: performance is high

Example for POP:


TC
Edit
Line 1 Col 1 Insert Indent Tab Fill Unindent * E:NONAME.C
/* Example for procedure orietned programming */
#include<stdio.h> /* standard input output header file */
void line()
{
printf("----------\n");
}
void main()
{
line();
printf("Good morning\n");
line();
printf("Welcome To C\n");
line();
printf("Thank you\n");
line();
}
You are screen sharing
EN
Stop share
Activate Windows
Go to PC settings to activate Windows.
Mute
Start Video
Participants
76
Chat
10
New share
Pause Share
Annotate
Remote control
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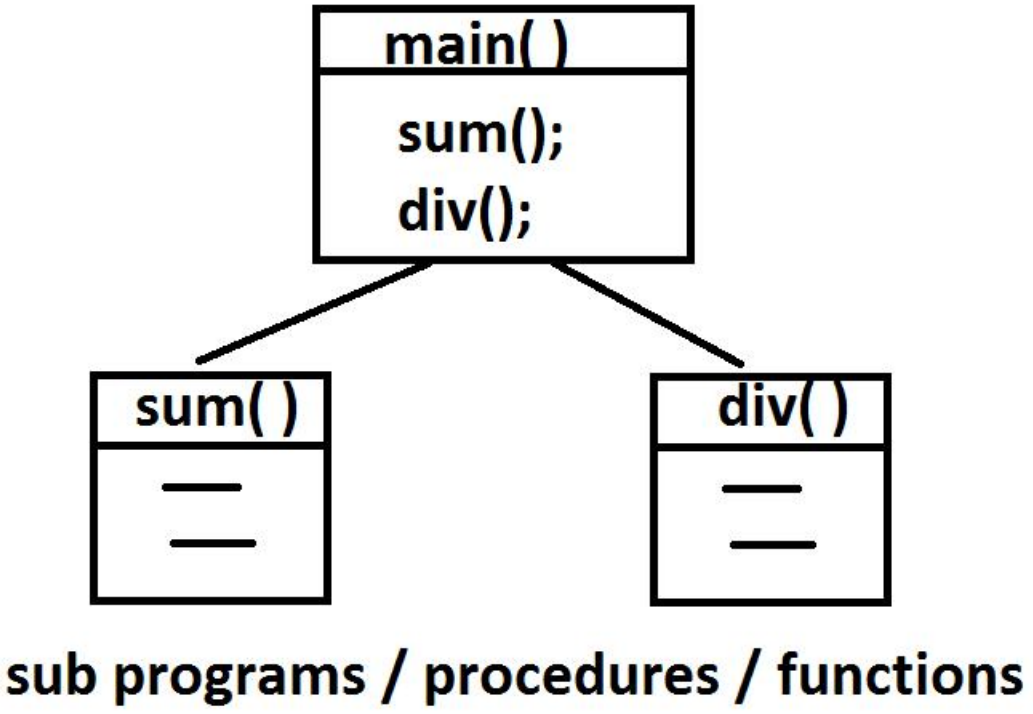
Structure of pop/fop:

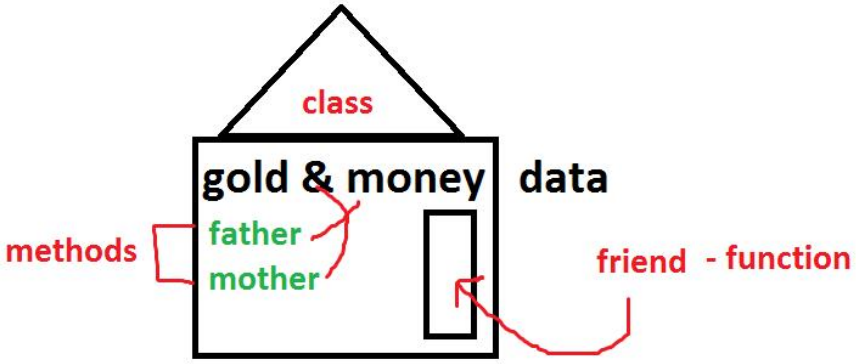


Disadvantage of pop:

The data is public. i.e. any function can access the data from anywhere.

Oops [Object oriented programming structure]

Data hiding
encapsulation
inheritance



Class: it is a blue print to create the objects.

Object: it is a class variable / instance of a class / physical copy of a class.

Inheritance

Polymorphism: poly means many + morph [forms / shapes / kinds]

Abstraction – briefing

Class stu

{

…;

….;

};

Class book

{

…;

….;

};

int a,b,c; ← **int** variables / copies / instance

class xyz;

xyz a, b, c; class variables

C is a pop

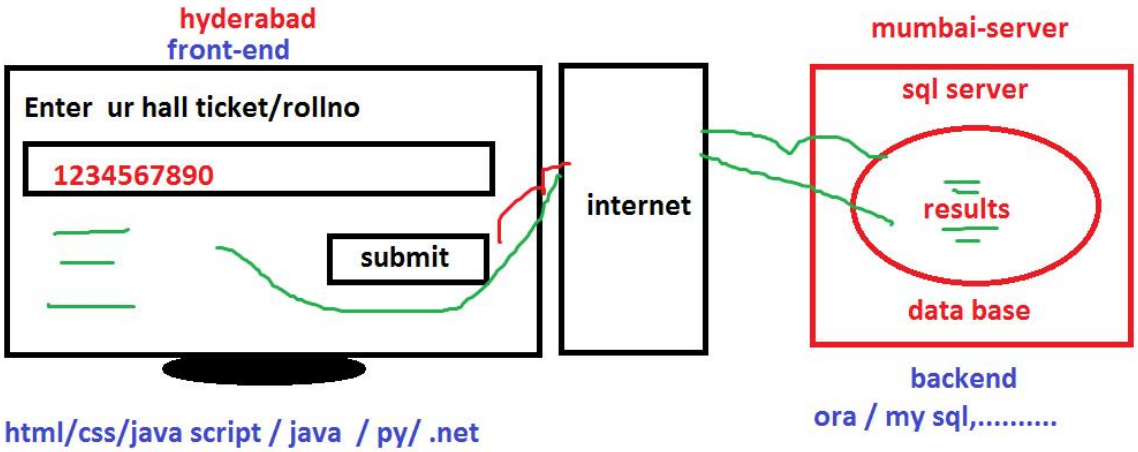
C++ & Python are called **multi-paradigm** programming languages. Because of this they follows both pops & oops.

Java & .net – oops

Why c is a general purpose language?

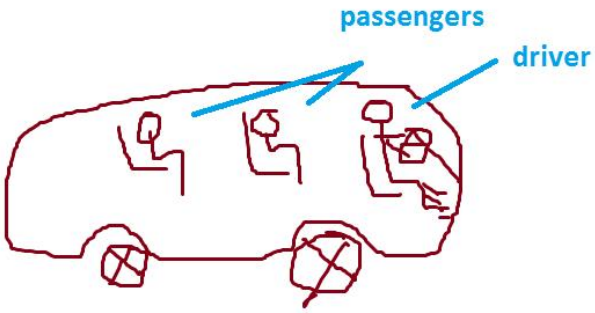
Using C language we can develop the software like

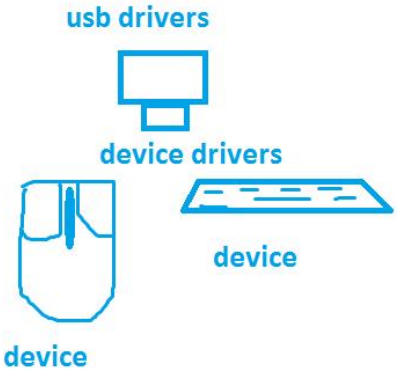
1. Operating systems
   Eg: windows, linux, mac, android, ios,..
2. Editors
   Eg: notepad, wordpad, ms-word,…
3. Translators
   Eg: compiler, interpreter, assembler
4. Commercial applications
   Eg: hotel / college / super market prog,…
5. Data base
   Eg: oracle, sql server, mangodb, access,…



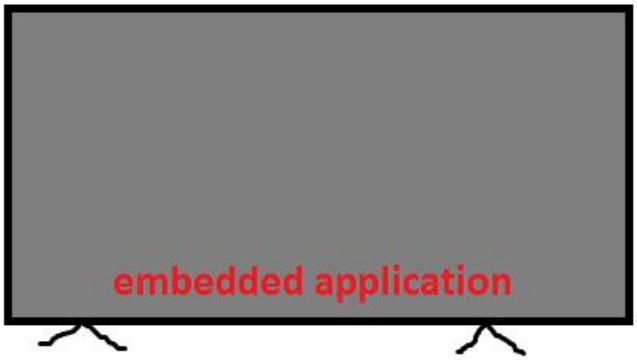
6. Device drivers

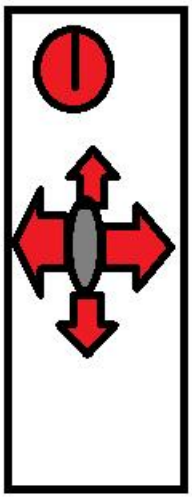
   Eg: audio / video / printer / usb drivers,…..

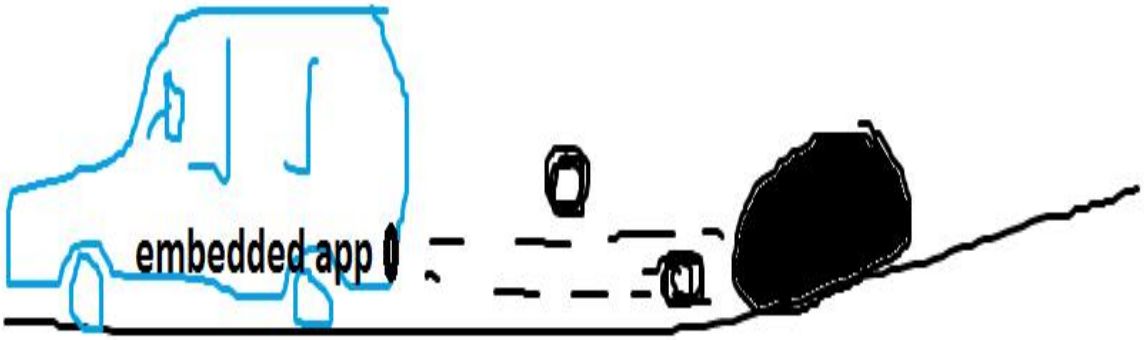




7. Embedded app







8. Mobile and pc games
9. Media players
   Eg: vlc, mx, windows media player,….
10. Antivirus
   Eg: avast, nod, mcafee,…
11. Browsers
   Eg: chrome, firefox, edge,….
12. Standalone application

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