INTRODUCTION TO C

C is a

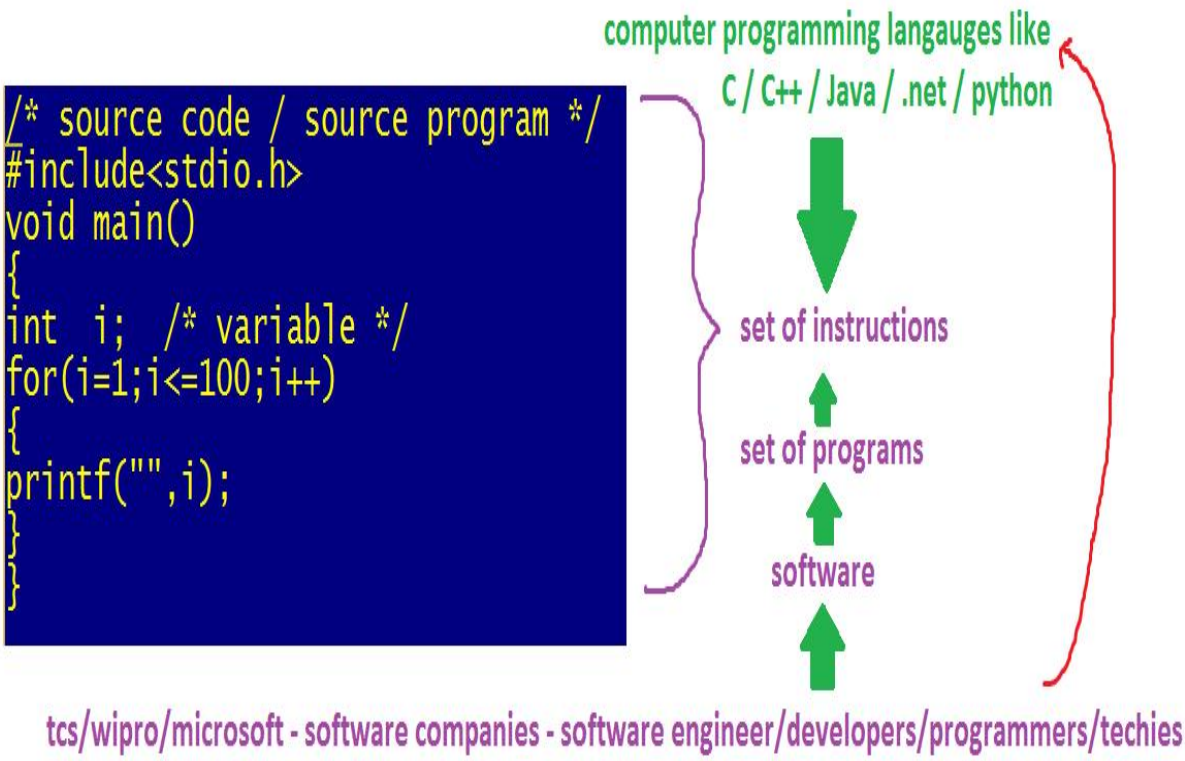
1. **It is a high level / middle level programming language.**
2. **C is a compiler based programming language.**
3. **C is a procedure oriented programming language[POP's].**
4. **C is a general purpose programming language.**

What is a program?

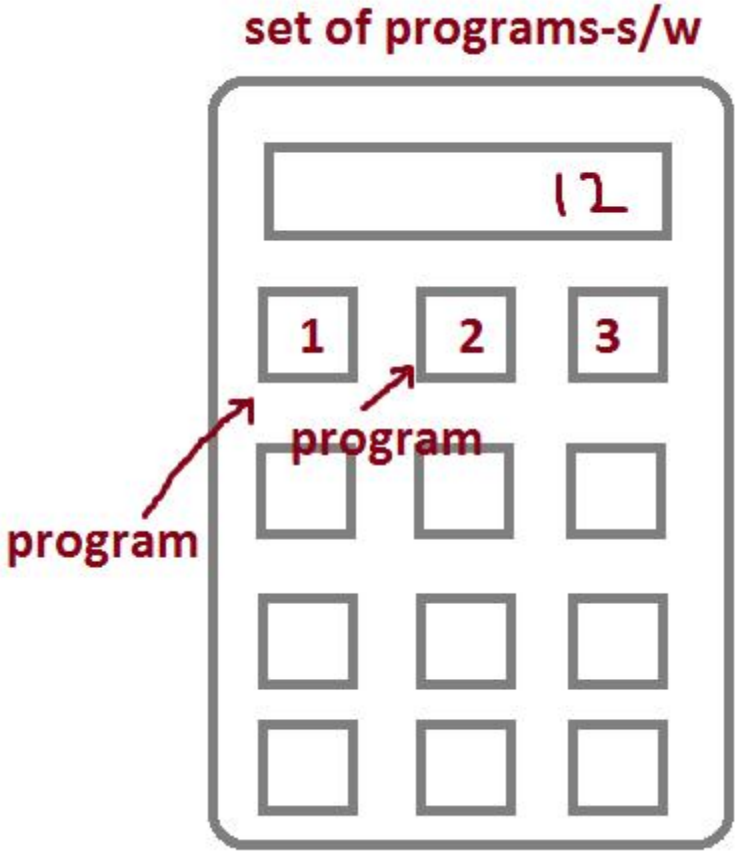
Set of instructions is called program.

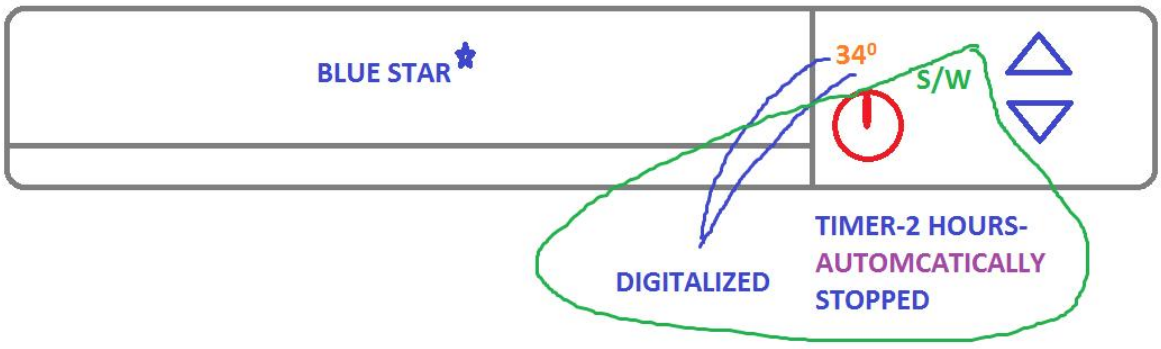
What is a software?

Set of programs is called software. As per it industry software is a digitalized and automated process.



tcs/wipro/microsoft - software companies - software engineer/developers/programmers/techies





We are having 2 type of software.

1. System software

Eg: o.s, device drivers, translators

2. Application software

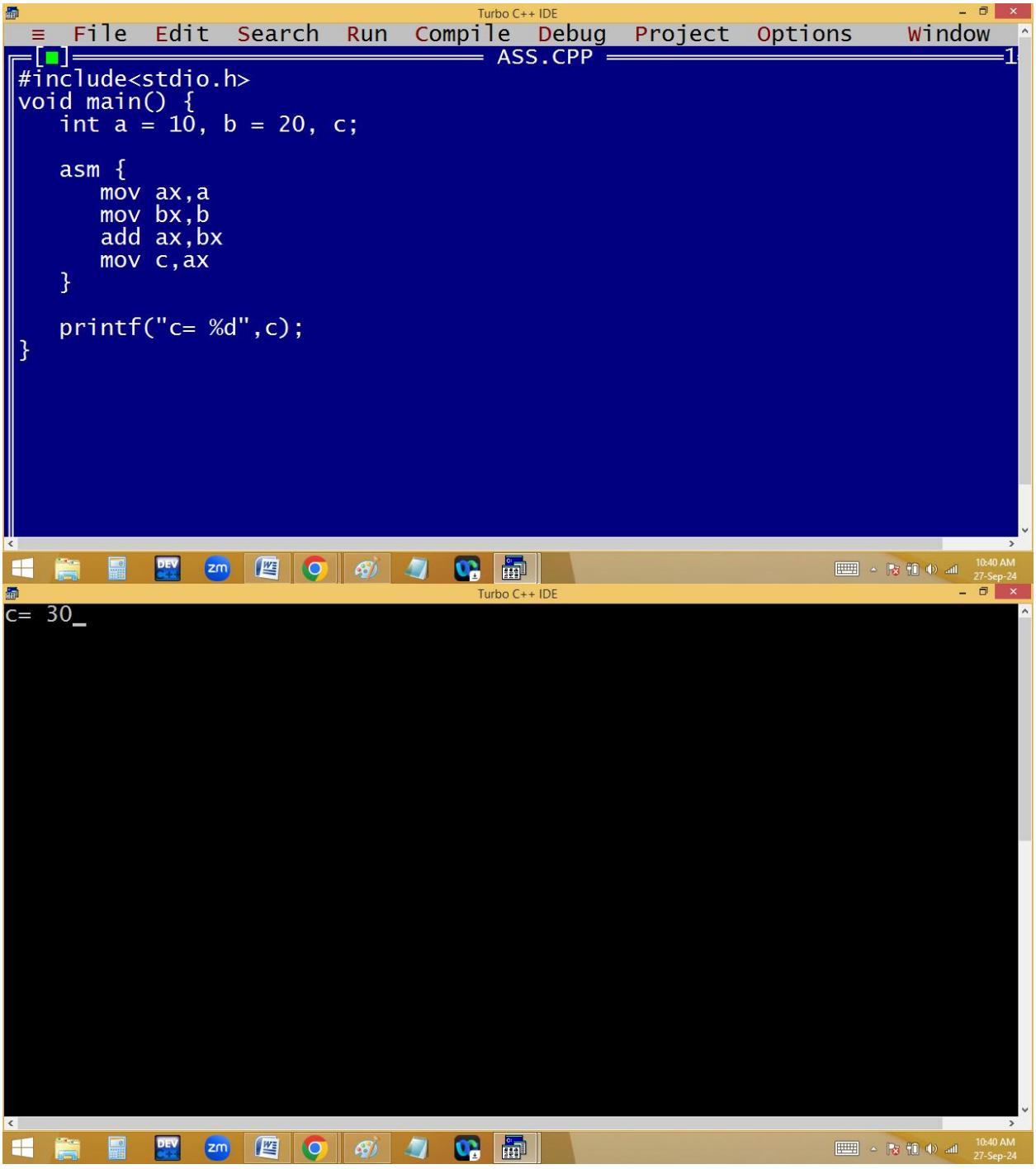
Eg: phonepe, irctc, whatsapp,instagram,…

What is a language?

Generally the languages like telugu / English / Marathi / hindi etc are used to communicate with humans. Hence they are called human languages / regional languages. By using these human languages we can't communicate with the machines. Hence we are using the computer programming languages like C / C++ / Java / .net / pythos etc. By using these languages we are creating the software [programs] to communicate.

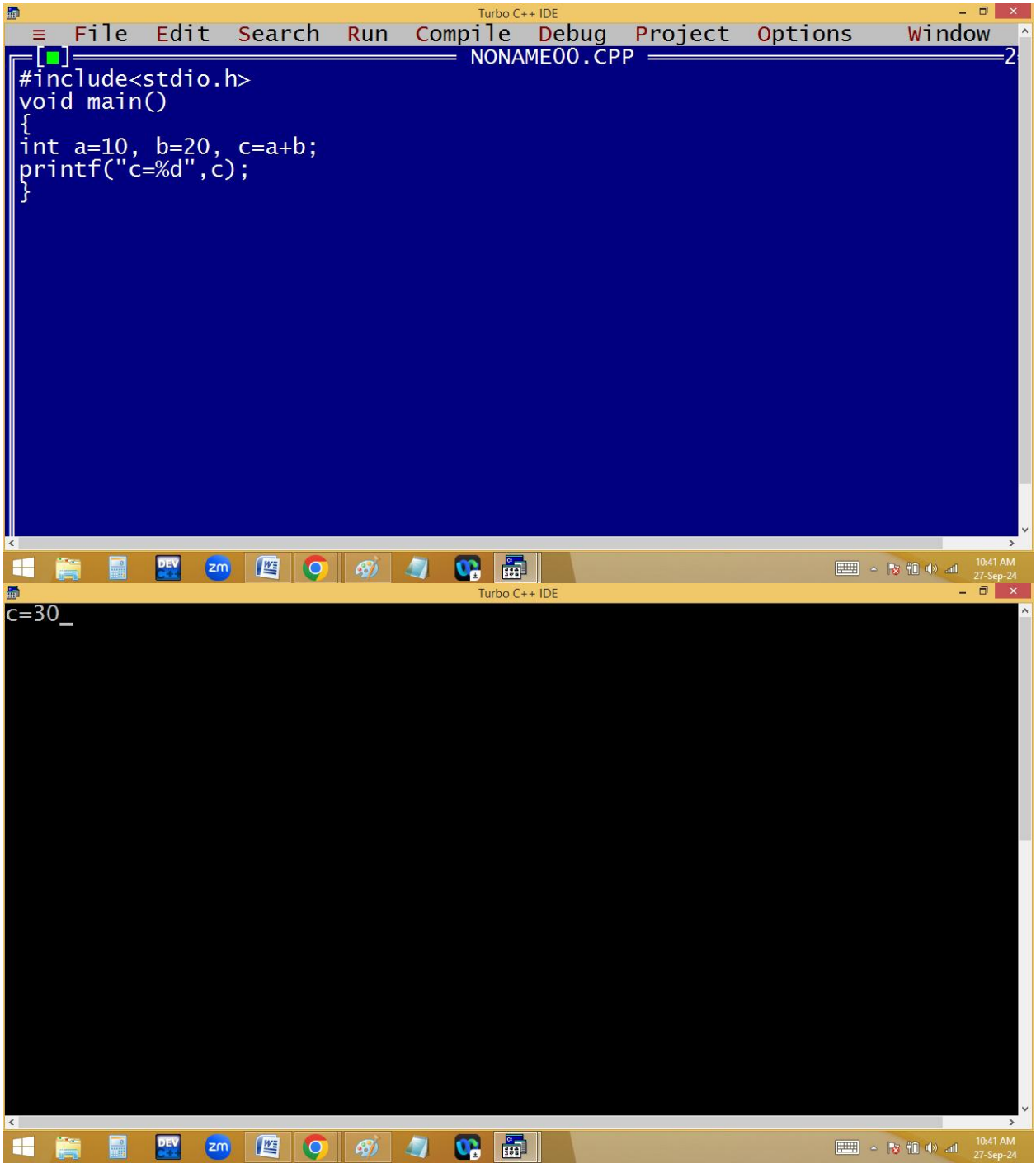
Basically the languages are divided into 3 types.

1. **Machine language: Created with binary code [0,1] and very difficult to understand.**
   Eg: 1000111
2. **Low level / assembly language: Created with English like shortcuts called MNEMONICS.**
   Eg: gd mrg, plz, sub,…….



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

Eg: good morning, please, subject,….



C comes with both low level and high level features. Hence it is a middle level language. Because of both features using c we can develop system software and

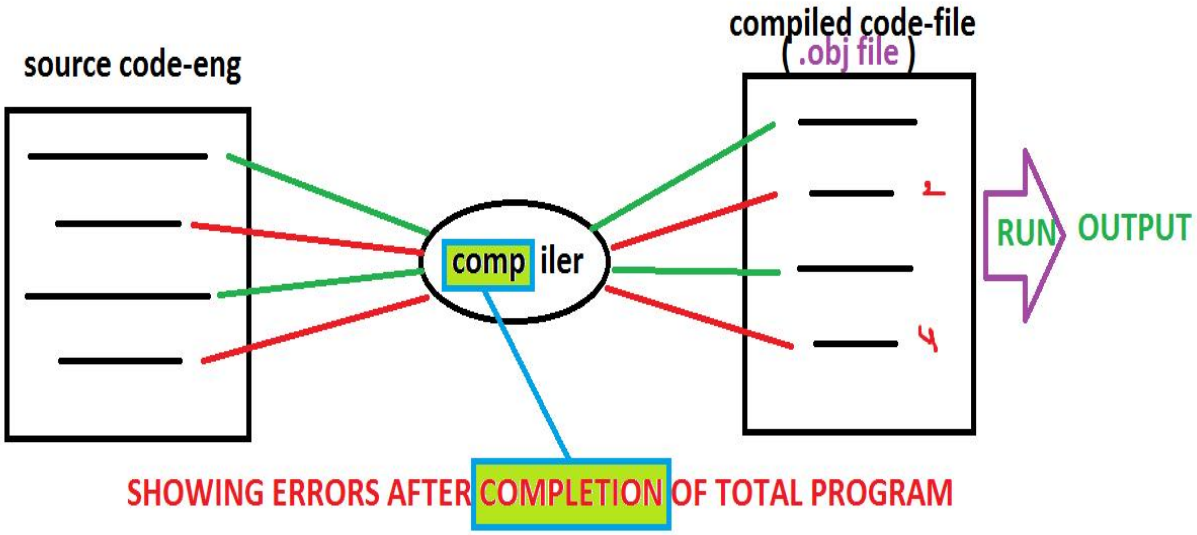
application software. Hence c is a multi-purpose programming language.

What is a compiler?

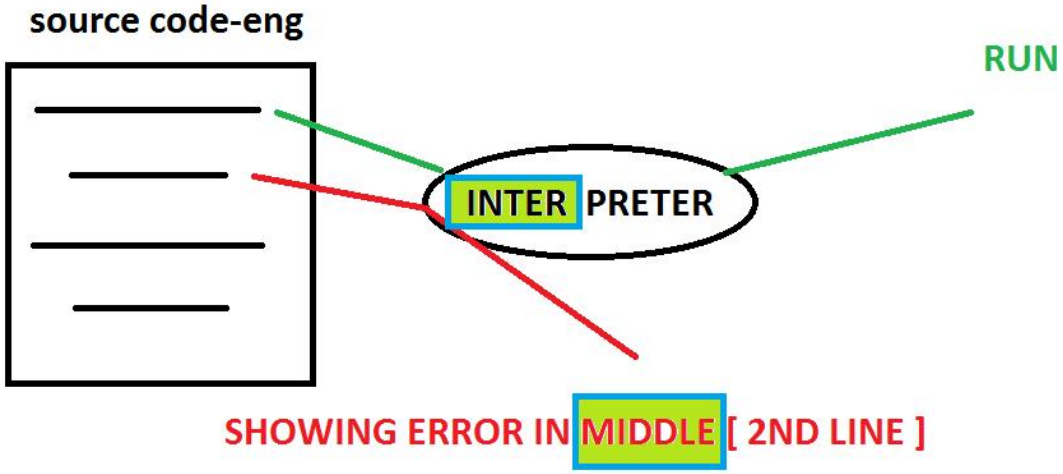
Always the user given instructions are in English, which is called source code or so9urce program. But the machine understandable language is binary code / machine language. To convert the source code to binary code and to check the errors we are using the translators like Compiler / interpreter / assembler.

Compiler and interpreter both are 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 converts line by line.



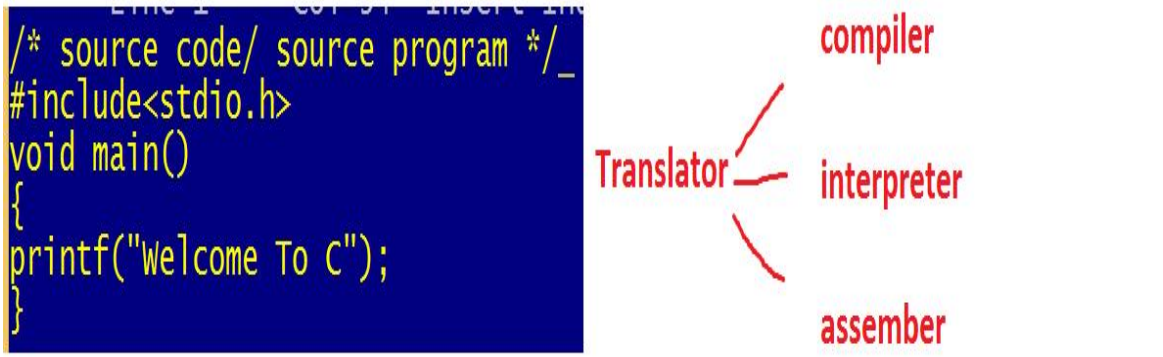
Assembler is used to convert low level programs to binary code.

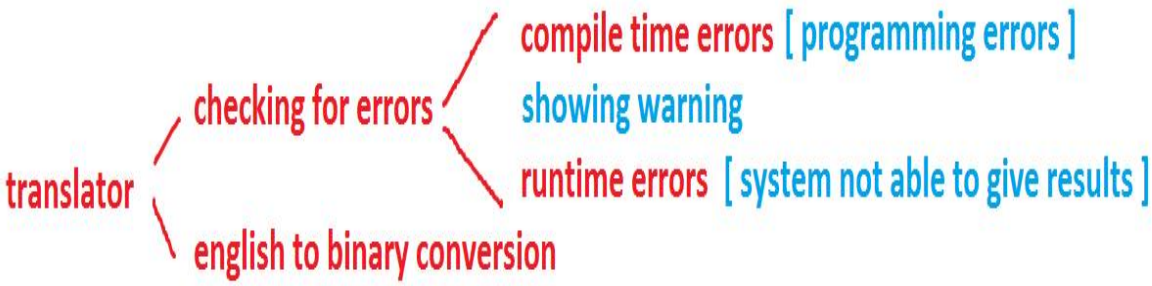
Assembler working style is similar to the compiler.

In c language we are using compiler as a interpreter. Hence it is a compiler based programming language.

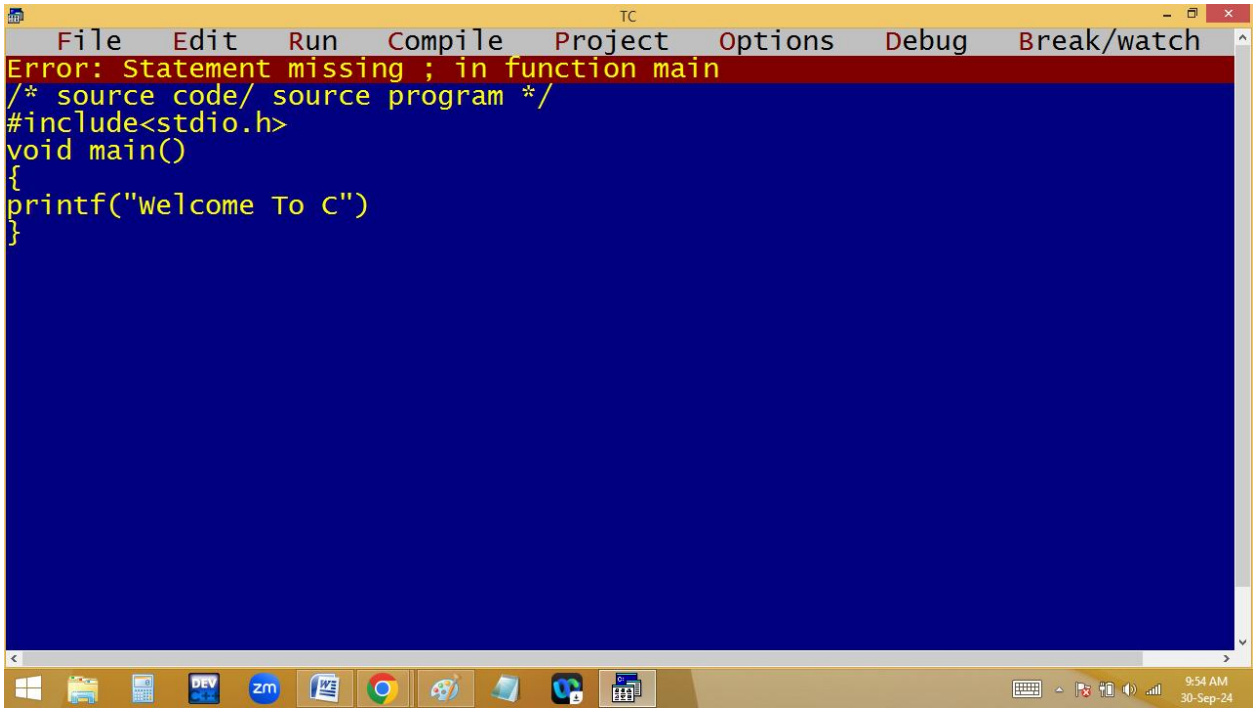
In java we are using both compiler and interpreter. Hence it is a compiler based interpreted language.

```c
/* source code/ source program */
#include<stdio.h>
void main()
{
printf("Welcome To C");
}
```

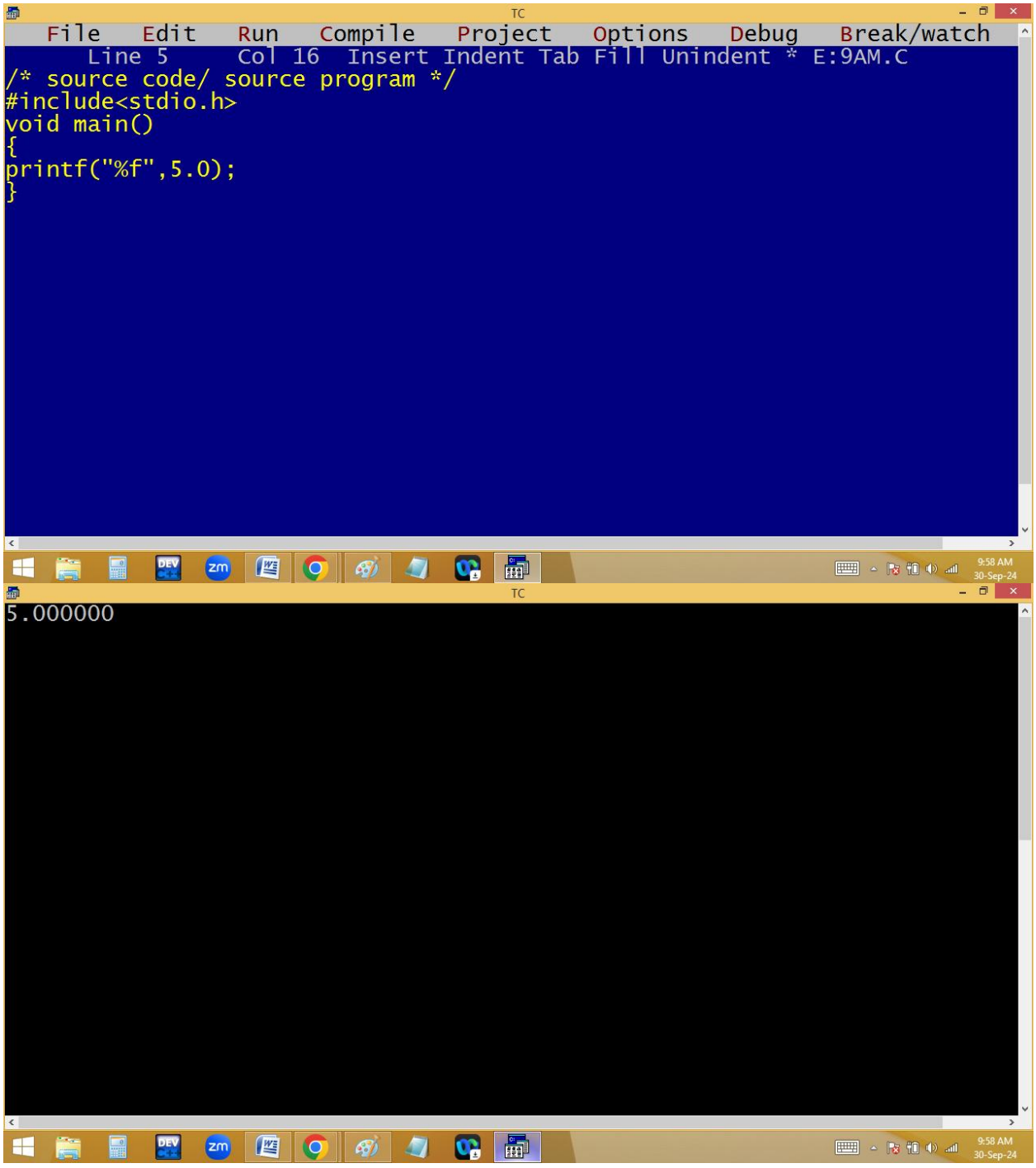


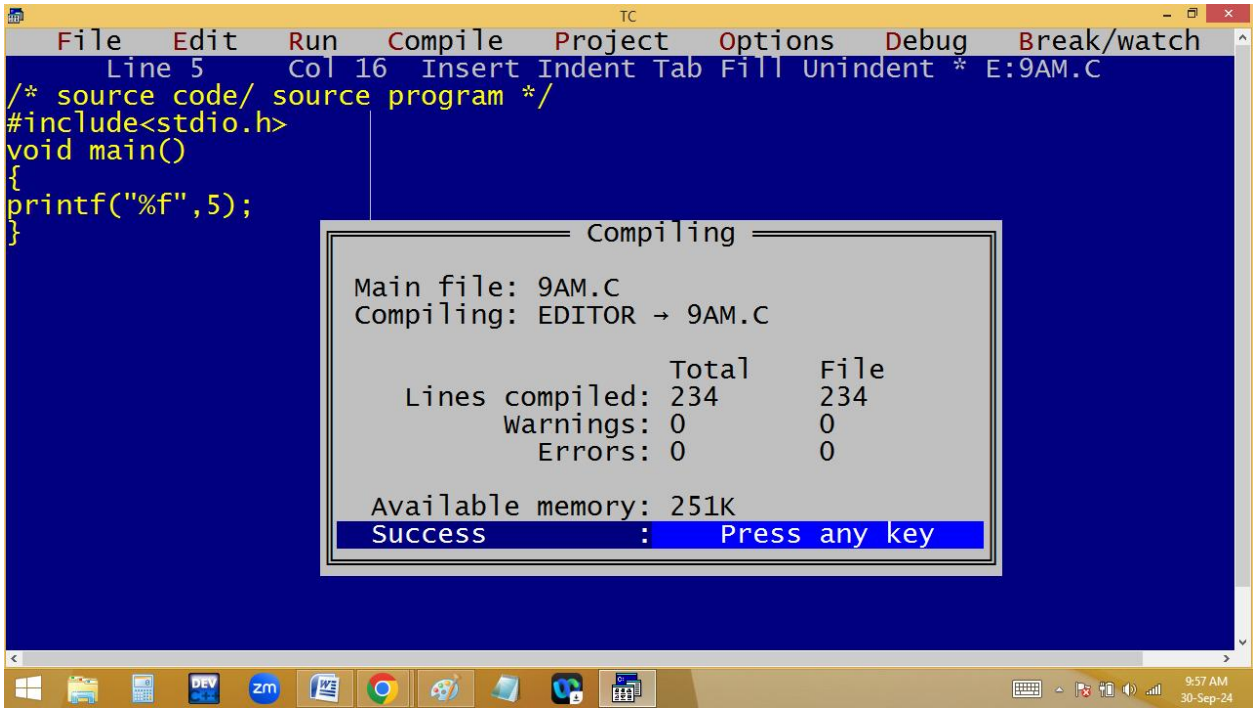


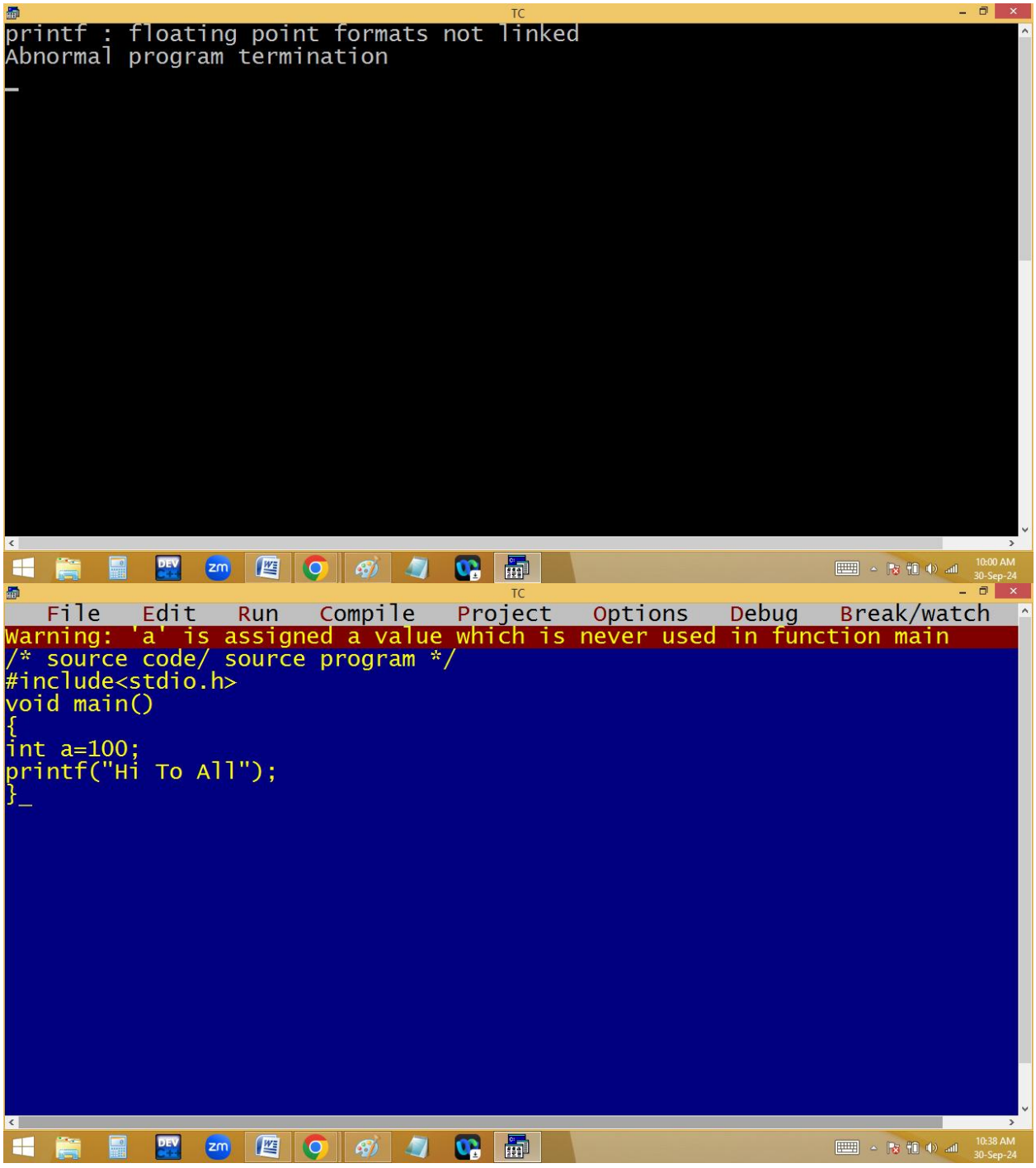
Example for compile time error:

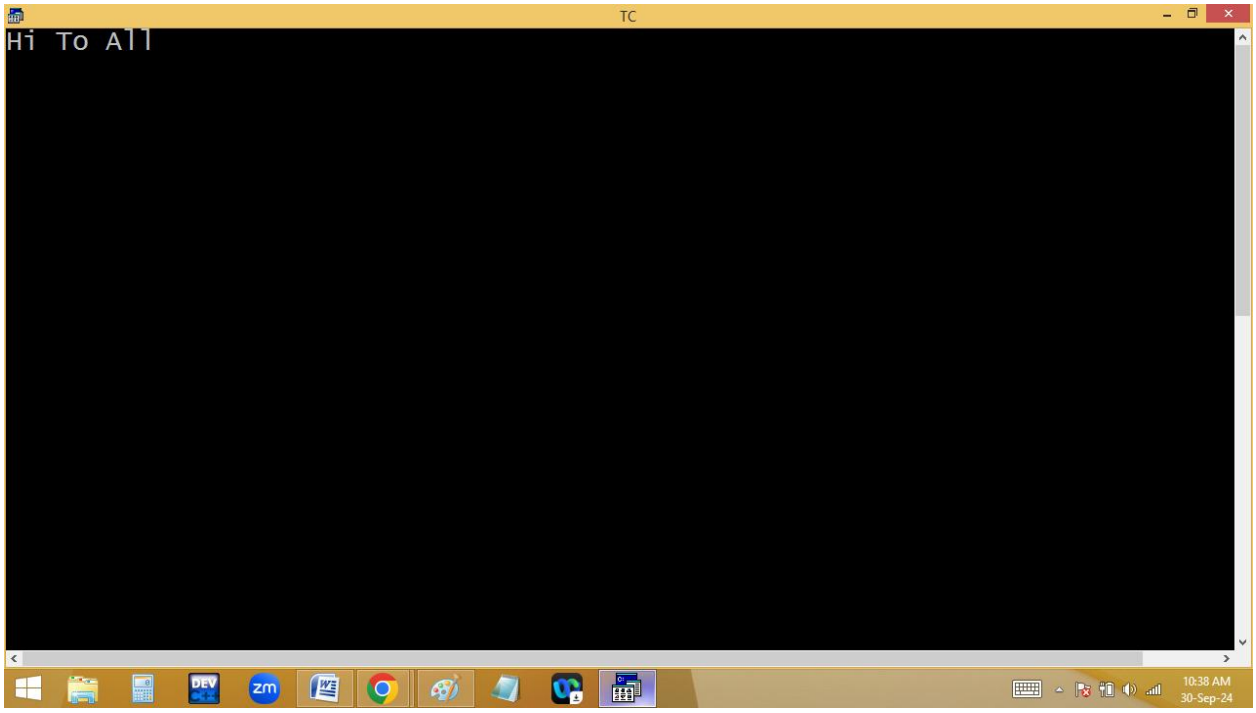


Example for runtime error:


TC
File Edit Run Compile Project Options Debug Break/watch
Line 5 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C
/* source code/ source program */
#include<stdio.h>
void main()
{
printf("%f",5.0);
}
9:58 AM
30-Sep-24
TC
5.000000
9:58 AM
30-Sep-24


TC
File Edit Run Compile Project Options Debug Break/watch
Line 5 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C
/* source code/ source program */
#include<stdio.h>
void main()
{
printf("%f",5);
}
Compiling
Main file: 9AM.C
Compiling: EDITOR → 9AM.C
Total File
Lines compiled: 234 234
Warnings: 0 0
Errors: 0 0
Available memory: 251K
Success : Press any key


TC
printf : floating point formats not linked
Abnormal program termination
TC
File Edit Run Compile Project Options Debug Break/watch
Warning: 'a' is assigned a value which is never used in function main
/* source code/ source program */
#include<stdio.h>
void main()
{
int a=100;
printf("Hi To All");
}

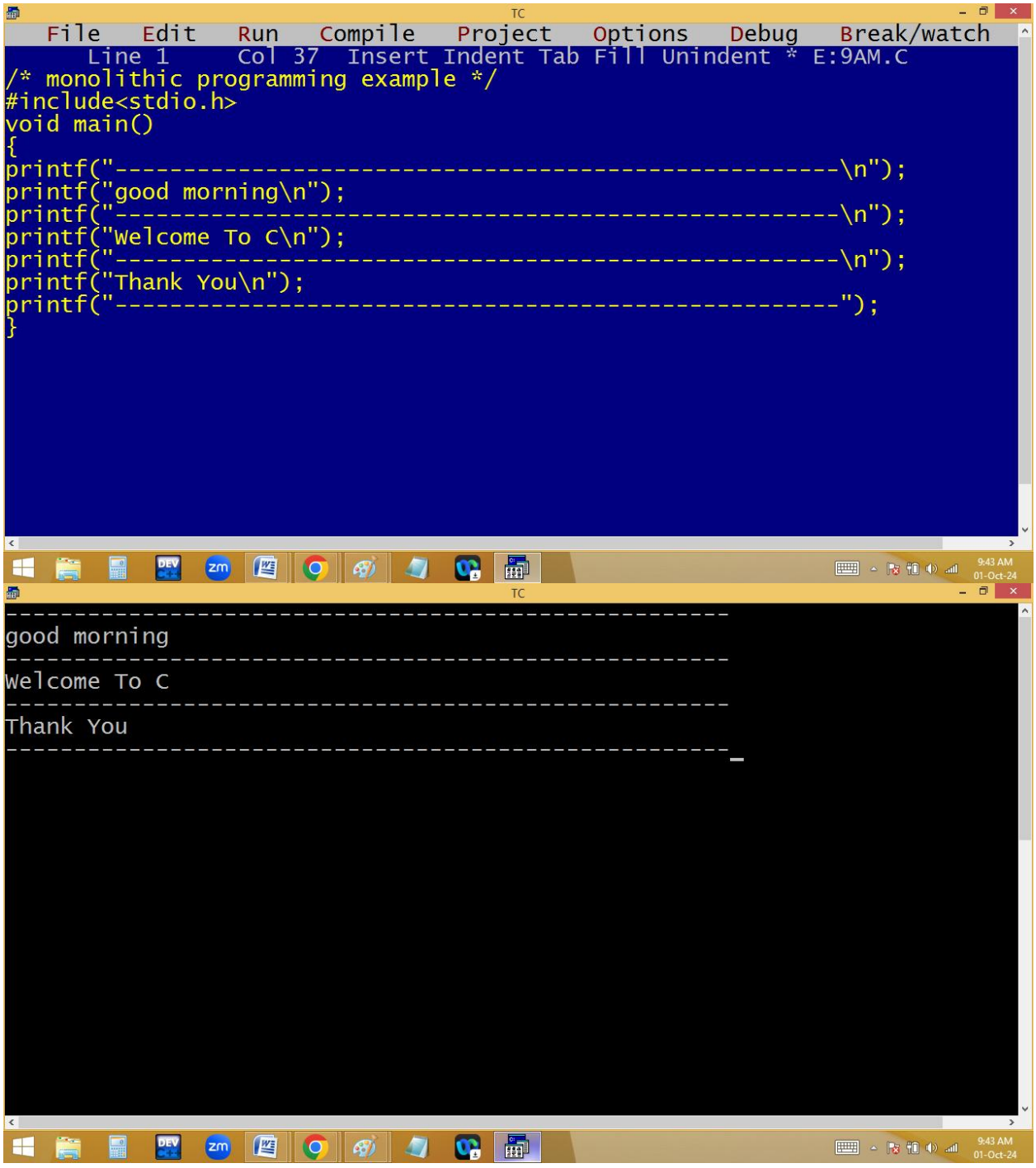


What is called programming paradigm?

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

Before C language, the languages are using monolithic programming paradigm. Here the entire program they are creating by using a single program. Due to this it is very difficult to

1. Find the errors
2. Take more memory
3. Performance is low
4. No reusability
5. Program size increased

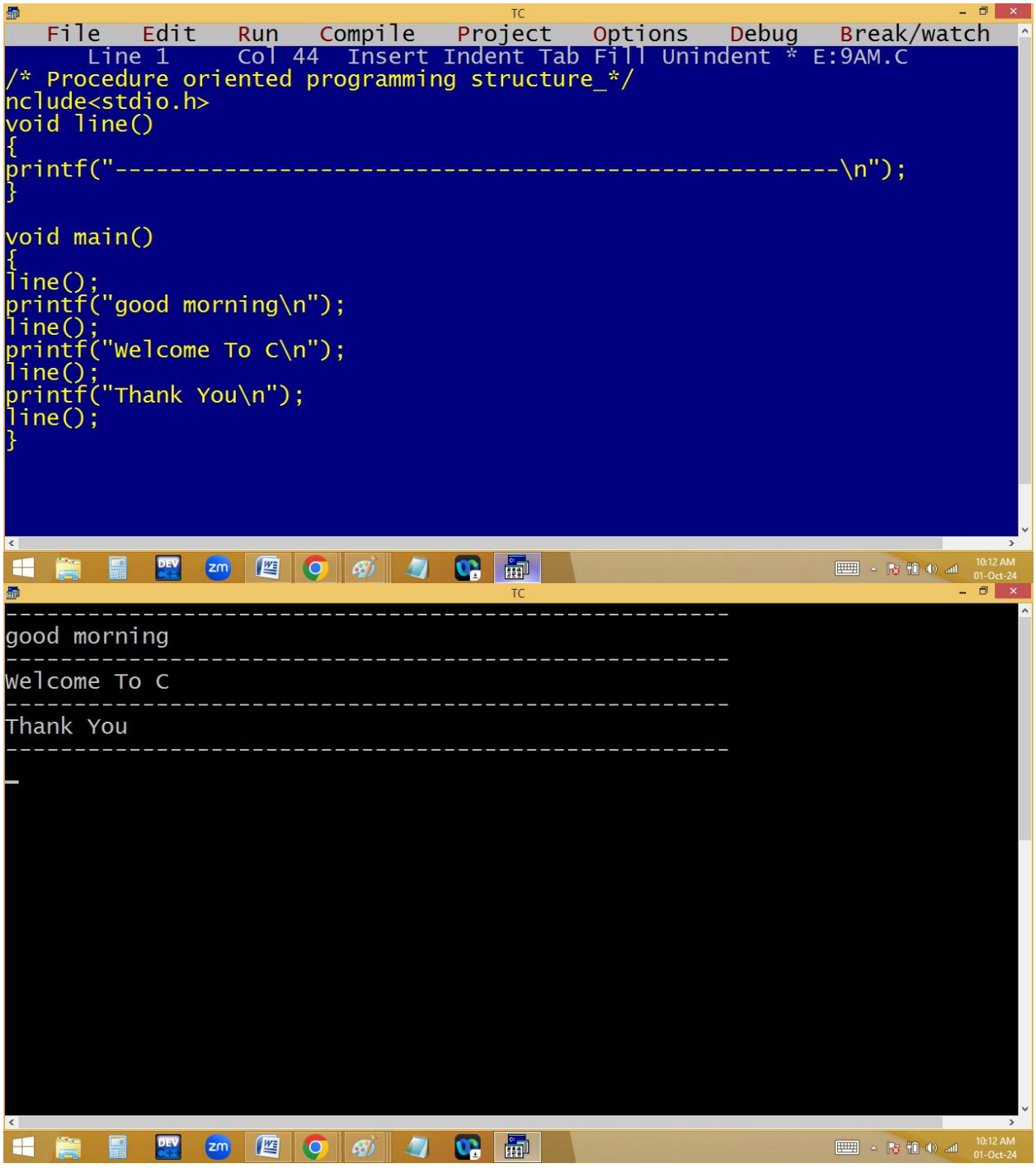


What is procedure oriented programming structure[POP's]: To avoid the drawbacks in monolithic programming problems, in C they have divided a big program into several small sub programs / sub routines /

procedures / functions / modules / structures. i.e. C program is collection of procedures, it is called POP's.

POP's Advantages:

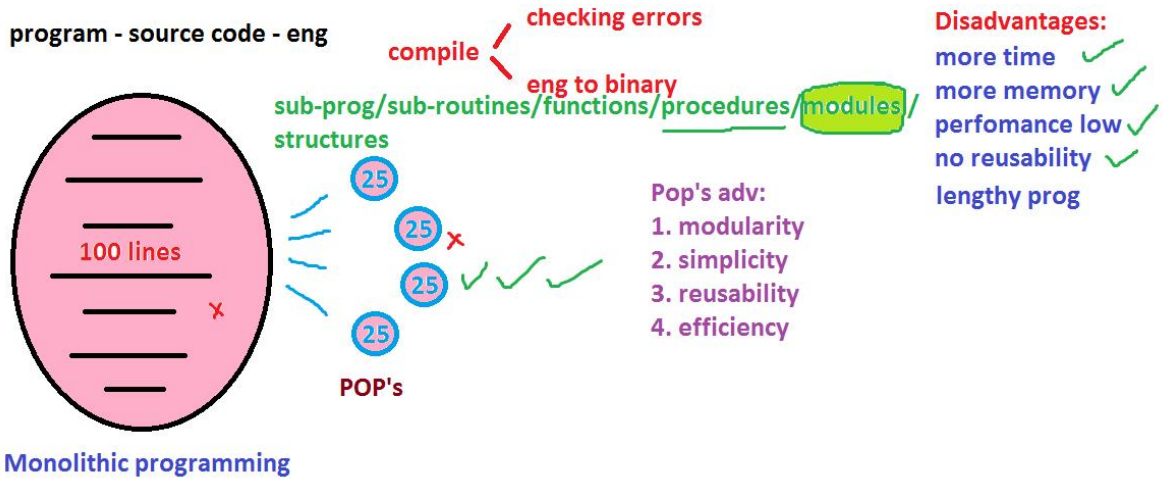
1. **Modularity: Dividing big program into several small pieces as per the project requirement.**
2. **Simplicity: easy to read and understand.**
3. **Reusability: Write once, use many times.**
4. **Efficiency: Performance is high.**

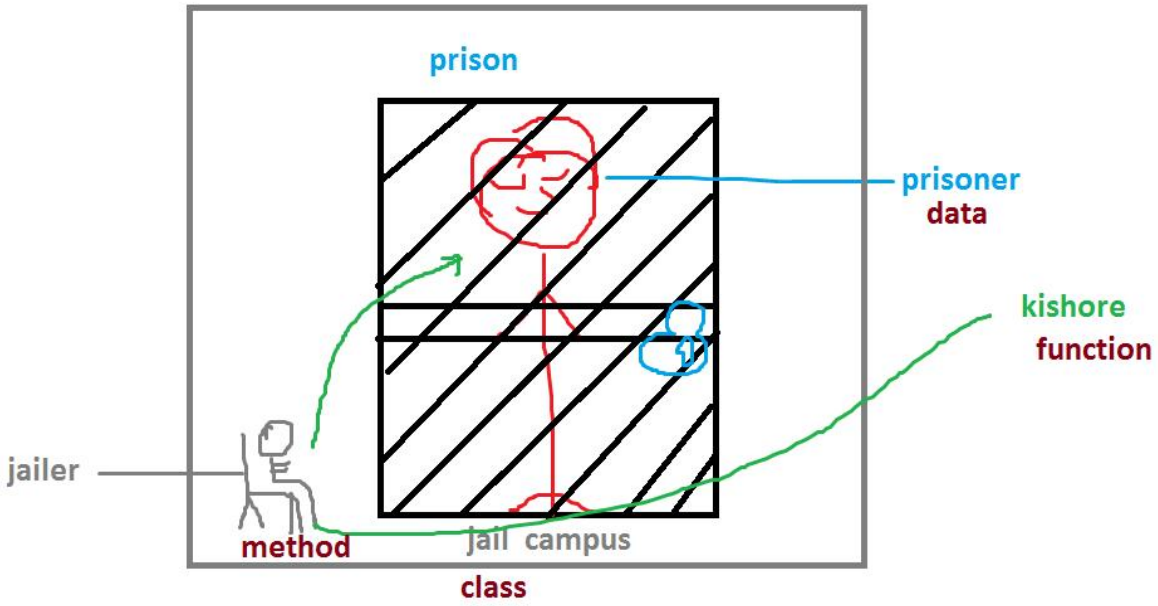

TC
File Edit Run Compile Project Options Debug Break/watch
Line 1 Col 44 Insert Indent Tab Fill Unindent * E:9AM.C
/* Procedure oriented programming structure_*/
nclude<stdio.h>
void line()
{
printf("----------\n");
}
void main()
{
line();
printf("good morning\n");
line();
printf("Welcome To C\n");
line();
printf("Thank You\n");
line();
}
10:12 AM
01-Oct-24
TC
----
good morning

Welcome To C

Thank You

10:12 AM
01-Oct-24





POP's Disadvantages:

In C the data is not secured because of by default it is public.

OOP's:

Object Oriented Programming Structure

Features:

1. **Class – It is a blue print to create the objects.**
2. **Object: it is the physical instance/copy of class**
3. **Data hiding – private / public / protected**
4. **Encapsulation**
5. **Inheritance**
6. **Poly-many morphism-shapes / kinds / forms**
7. **Abstraction - briefing**

class father – programmer – super / base class

{

200 lines

2 crore building;

};

Class newclass create from oldclass / sub / derived class

{

200 lines;

Class child derived from father

{

2 crore building

}

Class stu

{

…;

…;

}

Class emp

{

…;

…;

}

Why c is a general purpose language?

Using c language we can develop the software like

1. **Operating systems**
2. **Device drivers**
3. **Translators**
4. **Commercial applications**

5. Editors
6. Data base
7. Embedded applications
8. Antivirus
9. Browsers
10. Media players
11. PC & Mobile games
12. Any type of standalone applications