SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME : 23CST101 C PROGRAMMING AND DATA STRUCTURES
I YEAR / II SEMESTER

Unit 1- C PROGRAMMING FUNDAMENTALS- A REVIEW

Topic 1 :Fundamental rules – Structure of a 'C' program – Compilation and Linking processes

Brain Storming

1. What is Software?
2. How to develop software?

Example-Structure of C Program

```
#include <stdio.h>

void main()

{

printf("Hello C
Language");

}
```

Compile and Execute C Program in linux

•Open a text editor and add the above-mentioned code.

•Save the file as *hello.c*

•Open a command prompt and go to the directory where you have saved the file.

•Type *gcc hello.c* and press enter to compile your code.

•If there are no errors in your code, the command prompt will take you to the next line and would generate *a.out* executable file.

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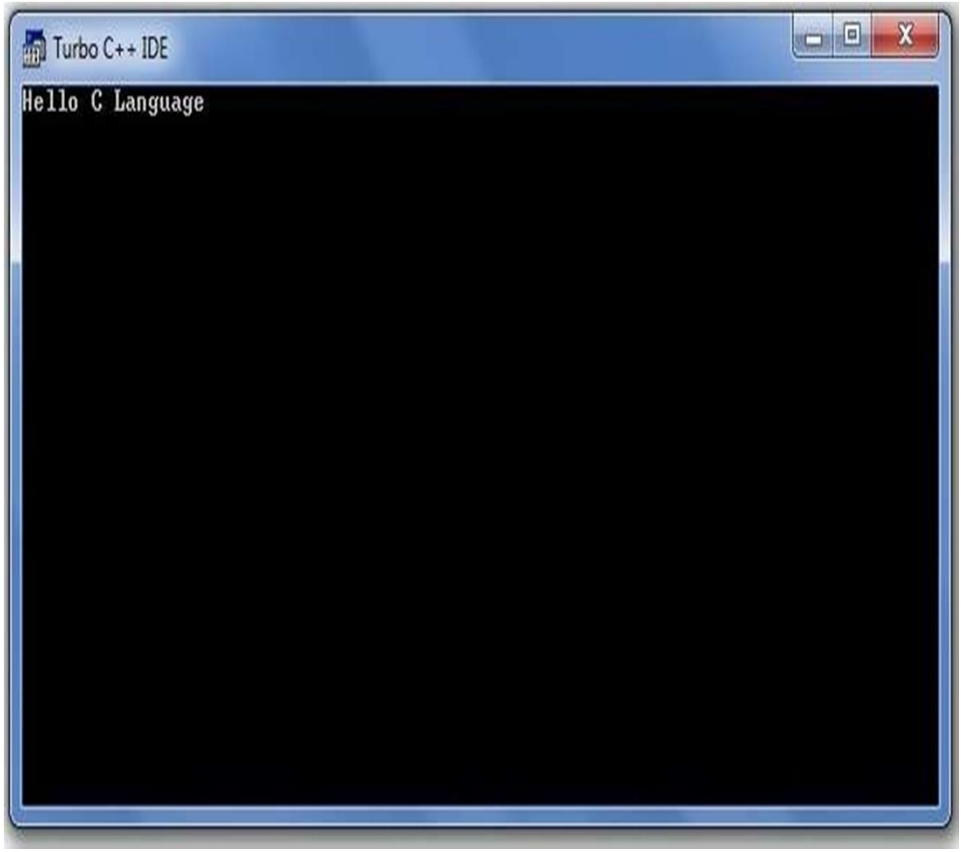
- If there are no errors in your code, the command prompt will take you to the next line and would generate *a.out* executable file.
- Now, type *./a.out or ./hello* to execute your program.
- You will see the output *"Hello World"* printed on the screen.

How to compile and run the c program in windows

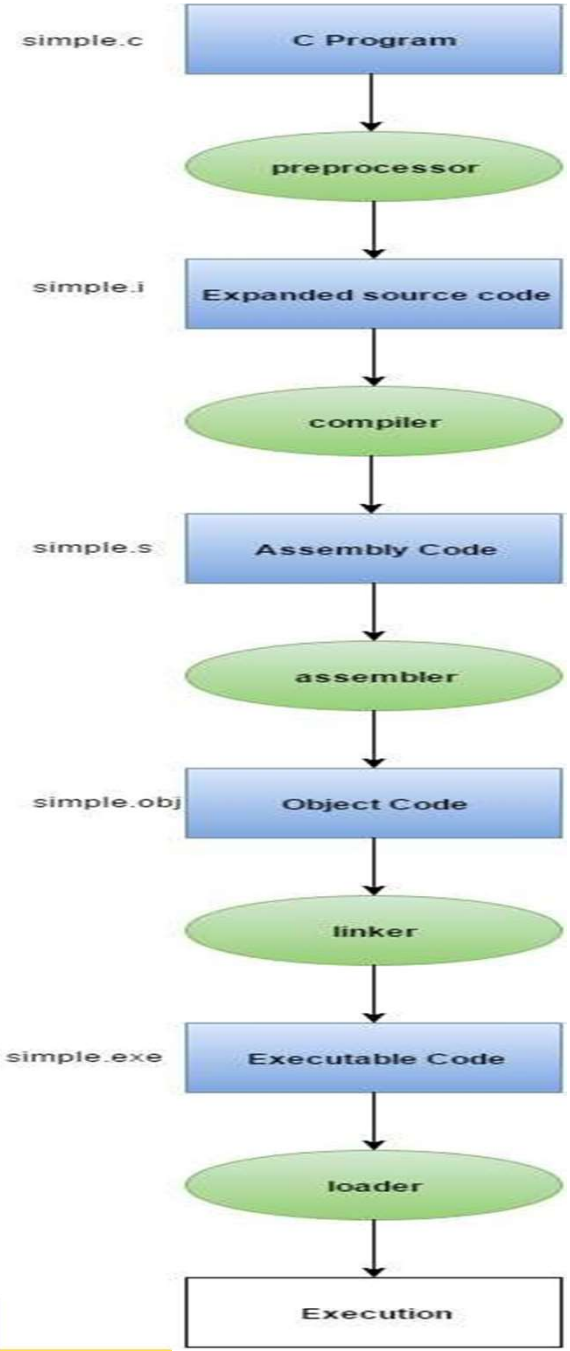
- Open the turbo C++ editor
- To save: filename.c (Example: hello.c)
- Type the program
- Compilation: Alt+F9
- Run : Ctrl+F9



Description

- **#include <stdio.h>** includes the **standard input output** library functions. The printf() function is defined in stdio.h
- **void main()** The **main() function is the entry point of every program** in c language. Void- the main program does not return any value.
- **printf()** The printf() function is **used to print data** on the console.

Compilation and Linking Process



Execution Flow

•C program (source code) is sent to preprocessor first. The preprocessor is responsible to **convert preprocessor directives into their respective values**. The preprocessor generates an expanded source code.

•Expanded source code is sent to compiler which compiles the code and converts it into assembly code.

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•The assembly code is sent to assembler which assembles the code and converts it into object code. Now a hello.obj file is generated.

•The object code is sent to linker which links it to the library such as header files. Then it is converted into executable code. A hello.exe file is generated.

•The executable code is sent to loader which loads it into memory and then it is executed. After execution, output is sent to console.

Execution Flow

Basic Structure of C programs

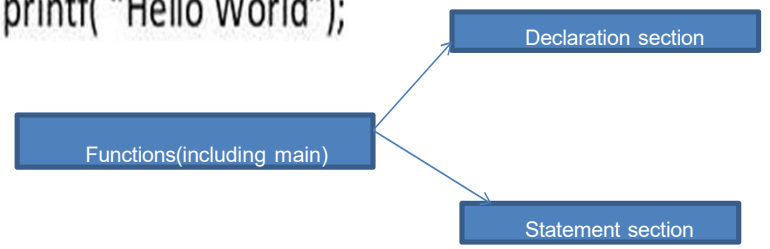
Documentation section represented used comment line //

Preprocessor Directive

```
#include <stdio.h>
#include <conio.h>

void main ( )
{
   printf( "Hello World");
}
```

void main ( )
- Every C program consists of one or more functions.
- main ( ) is a function. It is the first function to which control is passed from OS when a program is executed
- void indicates that the main function does not return any value



Example C Program

```
#include<stdio.
h>  void main()
{
int a, b, sum;
printf("\nEnter two no:
");  scanf("%d %d", &a,
&b);  sum = a + b;
printf("Sum : %d", sum);
}
```

OUTPUT:

Enter two no:5

6 Sum:11

Assessment 1

1. Write about compilation and linking process of C Program?

Ans :

References

TEXT BOOKS

1. Brian W. Kernighan and Dennis M. Ritchie, “The C Programming Language”, 2nd Edition, Pearson Education, 1988.

REFERENCES

1. Balagursamy “Programming In Ansi C “TATA Mc Graw Hill, First Edition,”2019.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, “Introduction to Algorithms", Second Edition, Mcgraw Hill, 2002.
3. Ashok.N.Kamthane,“ Computer Programming”, Pearson Education (India) (2010). (UNIT –II, III IV, V)

Thank You