

What is Programming?

Computer Programming is a medium for us to communicate with computers. Just like we use 'Hindi' or 'English' to communicate with each other, programming is a way for us to deliver our instructions to the computer.

What is C?

C is a programming language.

C is one of the oldest and finest programming languages.

C was developed by Dennis Ritchie at AT & T's Bell Labs, USA in 1972.

Uses of C

C language is used to program a wide variety of systems. Some of the uses of C are as follows:

- 1> Major parts of Windows, Linux and other operating systems are written in C.
- 2> C is used to write driver programs for devices like Tablets, printers etc.
- 3> C language is used to program embedded systems where programs need to run faster in limited memory (Microwave, cameras etc.)
- 4> C is used to develop games, an area where latency is very important. i.e. Computer has to react quickly on user input.

Chapter 1: Variables, Constants & Keywords

Variables

A variable is a container which stores a 'value'. In Kitchen, we have containers storing Rice, Dal, Sugar etc. Similar to that Variables in C stores value of a constant. Example:

`a = 3;` // a is assigned "3"

`b = 4.7;` // b is assigned "4.7"

`c = 'A';` // c is assigned 'A'

Rules for naming variables in C

1. First character must be an alphabet or underscore (`_`)
2. No commas, blanks allowed.
3. No special symbol other than (`_`) allowed.
4. Variable names are case sensitive.

We must create meaningful variable names in our programs. This enhances readability of our programs.

Constants

An entity whose value doesn't change is called as a constant.

A variable is an entity whose value can be changed.

Types of constants

Primarily, there are three types of constants:

- 1> Integer Constant $\rightarrow -1, 6, 7, 9$
- 2> Real Constant $\rightarrow -322.1, 2.5, 7.0$
- 3> Character Constant $\rightarrow 'a', '$', '@'$ (must be enclosed within single inverted commas)

Keywords

These are reserved words, whose meaning is already known to the compiler. There are 32 keywords available in C.

auto	double	int	struct
break	long	else	switch
case	return	enum	typedef
char	register	extern	union
const	short	float	unsigned
continue	signed	for	void
default	sizeof	goto	volatile
do	static	if	while

Our First C Program

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

```
int main() {  
    printf("Hello, I am learning C with Harry");  
    return 0;  
}
```

File: first.c

Basic Structure of a C Program

All C programs have to follow a basic structure. A C program starts with a main function and executes instructions present inside it.

Each instruction is terminated with a semicolon (;).

There are some rules which are applicable to all the C programs :

1. Every program's execution starts from main() function.
2. All the statements are terminated with a semicolon.
3. Instructions are case-sensitive.
4. Instructions are executed in the same order in which they are written.

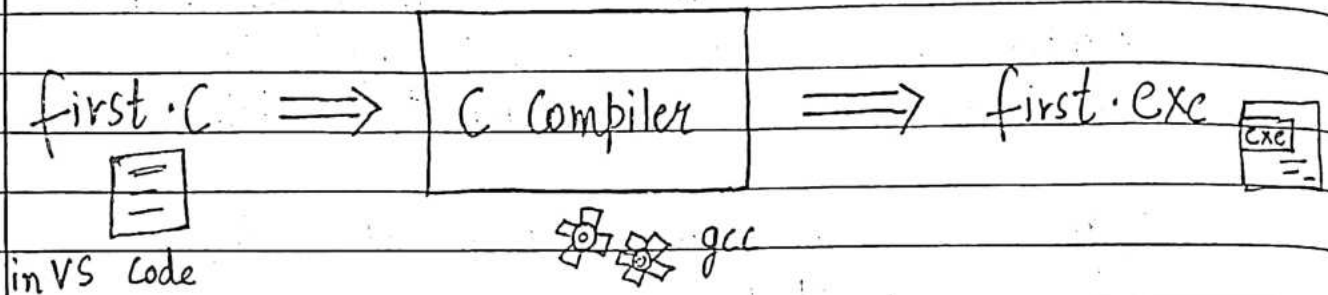
Comments

Comments are used to clarify something about the program in plain language. It is a way for us to add notes to our program. There are two types of comments in C.

1. Single line comment : // This is a comment
2. Multi-line comment : /* This is a multi line comment */

Comments in a C program are not executed and are ignored.

Compilation and Execution



A compiler is a computer program which converts a C program into machine language so that it can be easily understood by the computer.

A C program is written in plain text.

This plain text is combination of Instructions in a particular sequence. The compiler performs some basic checks and finally converts the program into an executable.

Library Functions

C language has a lot of valuable library functions which is used to carry out certain tasks. For instance `printf` function is used to print values on the screen.

```
printf("This is %d", i);
```

`%d` for integers

`%f` for real values

`%c` for characters