Chapter 0: Introduction

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 in 1972.

Uses of C

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

Major parts of Windows, Linux, and other operating systems are written in C.

C is used to write driver programs for devices like Tablets, Printers, etc.

C language is used to program embedded systems where programs need to run faster in limited memory.

C is used to develop games, an area where latency is very important, i.e., a computer has to react quickly to user input.

Chapter 1: Variables, Constants, and Keywords:

Variables

A variable is a container that stores a ‘value.’ In the kitchen, we have containers storing rice, dal, sugar, etc. Similar to that variable in c stores the 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. The first character must be an alphabet or underscore(_).

2. No commas or blanks are allowed.

3. No special symbol other than underscore is allowed

4. Variable names are case sensitive

Constants

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

Types of constant

Primarily there are 3 types of constant:

1. Integer Constant -1,6,7,9
2. Real Constant -322.1,2.5,7.0
3. Character Constant ‘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”);
return 0;

}
```

File : first.c

The basic structure of a C program

All c programs have to follow a basic structure. A c program starts with the main function and executes instructions presents inside it. Each instruction terminated with a semicolon(;)

There are some basic rules which are applicable to all the c programs:

Every program's execution starts from the main function.

All the statements are terminated with a semi-colon.

Instructions are case-sensitive.

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:

Single line comment: //This is a comment.

Multi-line comment : /*This is multi-line comment*/

Comments in a C program are not executed and ignored.

Compilation and execution

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

A program is written in plain text. This plain text is a 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 a certain task; 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

Types of variables

Integer variables int a=3;

Real variables int a=7.7 (wrong as 7.7 is real) ; float a=7.7;

Character variables char a=’B’;

Receiving input from the user

In order to take input from the user and assign it to a variable, we use scanf function.

The syntax for using scanf:

scanf(“%d”,&i); // [This & is important]

& is the “address of” operator, and it means that the supplied value should be copied to the address which is indicated by variable i.

Chapter 1: Practice Set:

Q1. Write a c program to calculate the area of a rectangle:

a) using hardcoded inputs &

b) using inputs supplied by the user

Q2. Calculate the area of a circle and modify the same program to calculate the volume of a cylinder given its radius and height.

Q3. Write a program to convert Celsius (Centigrade degrees temperature to Fahrenheit)

Q4. Write a program to calculate simple interest for a set of values representing principle, no of years, and rate of interest.