C Programming

Mid-Level (features of both low & high level), **Structural** (ability to break program into parts/block), **Procedural Oriented** programming language developed by **Dennis Ritchie** in **1972**.

Hello World Program

```
#include<stdio.h>
int main()
{
        pri ntf ("Hello World");
        ret urn(0);
}
```

Comments in C

Used for documenting code, Compiler ignores the comments in c program. Two Types:

1. Single Line Comments: Starts with double slash (**//**)

2. Multi Line Comments: Starts with /* & Ends with */

printf Function

Used to show output on the screen/console.

```
printf (fo rma t_s tring, data_t o_p rint);
printf ("%s ", " Pus hpender Singh");
```

Format string can be %d (**integer**), %c (**character**)**

%s (string**), %f (**float**)**, %lf (**double**)

scanf Function

Used to take command line input from the user. e.g.

Syntax: `scanf( " format string ", argume nt_ list);`

```
scanf( " %d", &num); // Take integer & store it in num variable
```

Data Types in C

A data type specifies the type of data that a variable

There are 4 Types of DataTypes:

1. **Basic/Fundamental**: int, char, float, double
2. **Derived**: array, pointer, structure, union
3. **Enumeration Data Type**: enum
4. **Void Data Type**: void

Variables in C

Variable is a **Name of Memory Location**, **Used to Store & Access Data**

Syntax to declare variable: `DataType Var iab leName = Value;`

e.g. `int rollNo = 69;`

General Rules for Constructing Variable Name

1. Variable can have **alphabets**, **digits** & **underscore**.
2. Can start with the **alphabet** & **underscore only**. It **CANNOT** start with a **digit**.
3. **No whitespace is allowed** within the variable name.
4. **CANNOT** be any **Reserved word** or **Keyword** e.g. int, float, etc.

Declaring Variable of Other DataTypes

```
// Create variables
int age = 35;
float percentage = 94.86; // 7 digit Decimal Precision
double pi_value = 3.1415 926 - 5359; // 15 Decimal Precision
char section = 'A';
// String: Array of characters
char name[] = " Pus hpender Singh";

// Print variables
printf ("Age: %d\n", age);
```

Declaring Variable of Other DataTypes (cont)

```
> printf("Percentage: %f\n", percentage);
printf("Percentage (Only 1 Decimal): %.1f\n", percentage);
printf("Value of Pi: %lf\n", pi_value);
printf("Section: %c\n", char);
printf("Name: %s\n", name);
```

Data Types

Data Type	Size	Description
int	2 or 4 bytes	e.g 20, 30, etc
float	4 bytes	Hold Upto 7 Decimal Digit
double	8 bytes	Hold Upto 15 Decimal Digit
char	1 byte	e.g. 'A', 'B', etc

Type Casting

```
// Implicit Casting (Automatic)
float lol = 10; // int to float
printf ("%f ", lol); // Output: 10.000000
int noice = 95.555 // float to int
printf ("%d ", noice); // Output: 95
// Explicit Casting (Manual)
float sum = (float) 5 / 2; // int to float
printf ("%f ", sum); // 2.500000
```


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