**How "Hello, World!" program works?**

* The #include <stdio.h> is a preprocessor command. This command tells compiler to include the contents of stdio.h (standard input and output) file in the program.  
  The stdio.h file contains functions such as scanf() and print() to take input and display output respectively.  
  If you use printf() function without writing #include <stdio.h>, the program will not be compiled.
* The execution of a C program starts from the main() function.
* The printf() is a library function to send formatted output to the screen. In this program, the printf() displays Hello, World! text on the screen.
* The return 0; statement is the "Exit status" of the program. In simple terms, program ends with this statement.

**Data Types in C**

Each variable in C has an associated data type. Each data type requires different amounts of memory and has some specific operations which can be performed over it. Let us briefly describe them one by one:

Following are the examples of some very common data types used in C:

* **char:** The most basic data type in C. It stores a single character and requires a single byte of memory in almost all compilers.
* **int:** As the name suggests, an int variable is used to store an integer.
* **float:** It is used to store decimal numbers (numbers with floating point value) with single precision.
* **double:** It is used to store decimal numbers (numbers with floating point value) with double precision.

Different data types also have different ranges upto which they can store numbers. These ranges may vary from compiler to compiler. Below is list of ranges along with the memory requirement and format specifiers on 32 bit gcc compiler.

| **Data Type** | **Memory (bytes)** | **Range** | **Format Specifier** |
| --- | --- | --- | --- |
| short int | 2 | -32,768 to 32,767 | %hd |
| unsigned short int | 2 | 0 to 65,535 | %hu |
| unsigned int | 4 | 0 to 4,294,967,295 | %u |
| int | 4 | -2,147,483,648 to 2,147,483,647 | %d |
| long int | 4 | -2,147,483,648 to 2,147,483,647 | %ld |
| unsigned long int | 4 | 0 to 4,294,967,295 | %lu |
| long long int | 8 | -(2^63) to (2^63)-1 | %lld |
| unsigned long long int | 8 | 0 to 18,446,744,073,709,551,615 | %llu |
| signed char | 1 | -128 to 127 | %c |
| unsigned char | 1 | 0 to 255 | %c |
| float | 4 |  | %f |
| double | 8 |  | %lf |
| long double | 12 |  | %Lf |