



C PROGRAMING

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Data Types

- **Data type defines storage space and format of variable.**

- **Primitive types**

- int
- char
- double
- float

- **Type Modifiers**

It modifies the range of base type

- Signed
- Unsigned
- Short
- Long

- **Integer types can be signed and unsigned**

- **Derived types**

- Array
- Pointer
- Function

- **Type qualifiers**

There are used to indicate special properties

- const and volatile

- **User defined types**

- struct
- union
- enum



Data Types

- **char**
 - **signed char (-128 to 127)**
 - **unsigned char (0 to 255)**
- **int / long (32-bit)**
 - signed int (-32,768 to 32,767 or -2,147,483,648 to 2,147,483,647)
 - unsigned int (0 to 65,535 or 0 to 4,294,967,295)
- **short int**
 - signed short (-32,768 to 32,767)
 - unsigned short (0 to 65,535)
- **long long / long (64-bit)**
 - signed long (-9223372036854775808 to 9223372036854775807)
 - unsigned long (0 to 18446744073709551615)
- **float: $\pm 3.4E \pm 38$**
- **double: $\pm 1.7E \pm 308$**



Data Types

C Basic Data Types	32-bit CPU		64-bit CPU	
	Size (bytes)	Range	Size (bytes)	Range
char	1	-128 to 127	1	-128 to 127
short	2	-32,768 to 32,767	2	-32,768 to 32,767
int	4	-2,147,483,648 to 2,147,483,647	4	-2,147,483,648 to 2,147,483,647
long	4	-2,147,483,648 to 2,147,483,647	8	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
long long	8	9,223,372,036,854,775,808 to 9,223,372,036,854,775,807	8	9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
float	4	3.4E +/- 38	4	3.4E +/- 38
double	8	1.7E +/- 308	8	1.7E +/- 308



Constants

- Integer Constants

- If integer constants starts with 0 it is assumed to be in octal number system
- If integer constant starts with 0x or 0X then it is assumed to be in hexadecimal number system 0x23 or 0X23 is valid which means 23 in hexadecimal number system is equivalent to 19 in decimal
- If integer constant has suffix character **l, L, u, U, f and F** , If integer constant is terminated with l, L then it is assumed to **Long** , if it is terminated with **u or U** then it is assumed to **unsigned** int
23l is a long integer , 23u is a unsigned integer , **f and F** can be used with **floating** point not with integer

- Float constant

- Floating point constant by default assumed to be of double eg:23.45 is a double
- Floating point constant if suffixed with f or F is considered to be of type float instead of double 23.45 is double and 23.45f or 23.45F is float



printf() and scanf()

- `#include <stdio.h>` -- function declaration
- `scanf()`
 - Used to input values from user.
 - Same format specifiers as of `printf()`.
 - Do not use any char other than format specifiers in format string.
 - To skip a char from input use `%*c`.



Problem solving

- Addition subtraction of two numbers
- Multiplication Table .





Thank you!

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