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)
  - unsinged long(0 to 18446744073709551615)
- float: ± 3.4E +/- 38
- double: ± 1.7E +/- 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- 9,223,372,036,854,775,807
long long	8	9,223,372,036,854,775,808- 9,223,372,036,854,775,807	8	9,223,372,036,854,775,808- 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 contants starts with <mark>0 it is assumed to be in octal number system</mark>
  - If integer constant starts with <mark>0x or 0X then it is assumed to be in hexadecimal number system</mark> 0x23 or 0X23 is valid which means 23 in hexadecimal number system is equivalent to 35 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 <mark>default assumed to be of double eg:23.45 is a double</mark>
  - 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.   (supress character)

Problem solving

- Addition substraction of two numbers

- Multiplication Table .

Thank you!

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