

DATA TYPES :-

Data types is the type of the data, that we are going to access within the program. 'C' supports different data types.

Each datatype may have predefined memory requirement and storage representation.

'C' supports the following 4 classes of data types.

PRIMARY	USER DEFINED	DERIVED	EMPTY
char int float double	typedef	arrays pointer structures union	void

The bytes occupied by each of the Primary data types are

Data types	Description	Memory Requirement	Range
int	Integer quantity	2 bytes	-32,768 to 32,768
char	single character	1 byte	-128 to 127
float	floating pointing no's.	4 bytes	-3.4E-38 to 3.4E+38.
double	double precision floating pointing no's.	8 bytes	1.7E-308 to 1.7E+308

The Primary data types are divided into the following

INTEGER TYPE

signed	unsigned
int	unsigned int
short int	unsigned short int
long int	unsigned long int

CHARACTER TYPE

char	signed char	unsigned char
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FLOAT TYPE

float	double	long double
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EMPTY DATA TYPE

void

INTEGERS TYPE:-

They are the numbers with the supported ranges. usually the integers occupy one word of storage typically 16 or 32 bits. The size of the integers depends upon the system.

eg:- If we use 16 bit word length, the size

can be limited upto -32768 to 32767

FLOAT TYPE:-

The floating point numbers are generally

stored in 32 bits with the 6 digits of precision. These numbers are defined by using the keywords float and double. where the double datatype number uses the 64 bits with the 14 digits of precision.

CHARACTER TYPE:-

character is generally stored in 8 bits

of the internal storage of computer and a single character can be defined as char

datatype

NULL DATA TYPE:-

The void is the null data type in 'C' language. This is generally specified with the function which has no arguments.

TYPE QUALIFIERS:-

If we use a 16 bit word length, size of an datatype value is limited to the specific range. So in order to provide some control over the range of numbers and storage space of the data type, some basic datatypes can be augmented by using the data type qualifiers they are

short, long, signed, unsigned.

The declaration of long and unsigned integer permits us to increase the range of values.

The precedence of signed declaration for an integer is essential as the default declaration assumes signed numbers.

Sizes and Ranges of datatypes with type Qualifiers.

TYPE	SIZE (bytes)	RANGE
char or signed char	1	-128 to 127
unsigned char	1	0 to 255
int or signed short int	2	-32,768 to 32,767
unsigned int	2	0 to 65,535
short int or signed short int	1	-128 to 127
unsigned short int	1	0 to 255
long int or signed long int	4	-2,147,483,648 to 2,147,483,647
unsigned long int	4	0 to 4,294,967,295
float	4	$3.4E-38$ to $3.4E+38$
double	8	$1.7E-308$ to $1.7E+308$
long double	10	$3.4E-4932$ to $1.1E+4932$

How float and double stored ?

* They are stored in mantissa & exponent forms where the exponent represents power of 2.

* Number of bytes used to represent a floating point number generally depends on the precision of the value.

FLOAT

It used to declare single precision of the value.

DOUBLE

used to represent double precision values.