

# Motor Industry Software Reliability Association (MISRA)

## ✓ Alphabets

```
Uppercase: A B C ..... X Y Z
Lowercase: a b c ..... x y z
```

C accepts both lowercase and uppercase alphabets as variables and functions.

## ✓ Digits

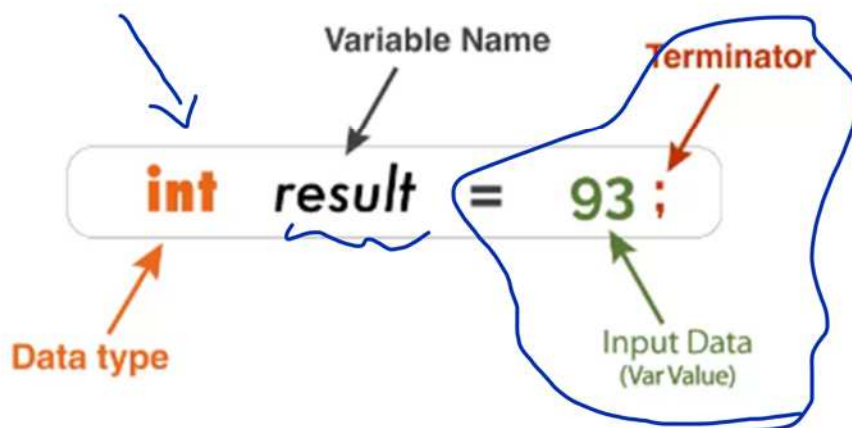
```
0 1 2 3 4 5 6 7 8 9
```

✓ Special Characters in C Programming				
,	<	>	.	-
(	)	;	\$	:
%	[	]	#	?
'	&	{	}	"
^	!	*	/	
_	\	~	+	

C Keywords			
✓ auto	✓ double	✓ int	✓ struct
✓ break	✓ else	✓ long	✓ switch
✓ case	✓ enum	✓ register	✓ typedef
✓ char	✓ extern	✓ return	✓ union
✓ continue	✓ for	✓ signed	✓ void
✓ do	✓ if	✓ static	✓ while
✓ default	✓ goto	✓ sizeof	✓ volatile
✓ const	✓ float	✓ short	✓ unsigned



**data\_type** var\_name;

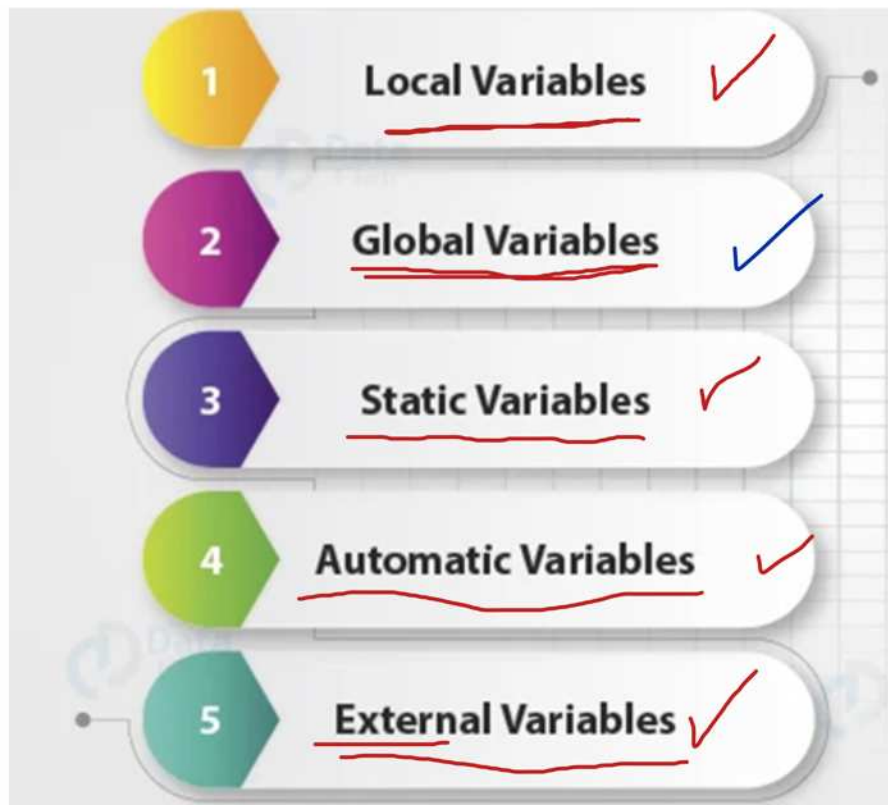


Type	Size (Bits)	Range
char	8	-128 to 127
unsigned char	8	0 to 255
signed char	8	-128 to 127
int	16	-32768 to 32767
short int	16	-32768 to 32767
unsigned int	16	0 to 65535
signed int	16	-32768 to 32767
long int	32	-2147483648 to 2147483647
unsigned long int	32	0 to 4294967295
signed long int	32	-2147483648 to 2147483647
float	32	$\pm 1.175e-38$ to $\pm 3.402e38$
double	64	$\pm 1.175e-38$ to $\pm 3.402e38$

TYPE	NAME	VALUE	
int	number	1	Stored only Integer
int	sum	500500	Stored only Integer
double	radius	5.5	Stored only floating-point number
double	area	95.0334	Stored only floating-point number
String	greeting	Hello	Stored only texts
String	statusMsg	Game Over	Stored only texts

## C Variable Names

- Names can contain letters, digits and underscores.
- Names must begin with a letter or an underscore (\_)
- Names are case sensitive ( myVar and myvar are different variables)
- Names cannot contain whitespaces or special characters like !, #, %, etc.
- Reserved words (such as int ) cannot be used as names.



## ✓ Preprocessor Directives

✓ <u>#define</u>	Substitutes a preprocessor macro
✓ <u>#include</u>	Inserts a particular header from another file
✓ #undef	Undefines a preprocessor macro
✓ <u>#ifdef</u>	Returns true if this macro is defined
✓ <u>#ifndef</u>	Returns true if this macro is not defined
✓ #if	Tests if a compile time condition is true
✓ #else	The alternative to the previous #if
✓ #elif	Abbreviation of #else and #if in one statement
✓ <u>#endif</u>	Ends preprocessor conditional
✓ #error	Prints error message on stderr
✓ #pragma	Issues special commands to the <u>compiler</u>



`#include <stdint.h>`

Type	Description
<u>int8_t</u>	signed int, 8 bit wide
int16_t	signed int, 16 bit wide
int32_t	signed int, 32 bit wide
int64_t	signed int, 64 bit wide
<u>uint8_t</u>	unsigned int, 8 bit wide
uint16_t	unsigned int, 16 bit wide
uint32_t	unsigned int, 32 bit wide
uint64_t	unsigned int, 64 bit wide

## Comments

// Single line comment

/\* Multi-line comment \*/

Preprocessor directive

Macro value

**#define** **PI** 3.14

Macro name

Type	Size	Range	Format specifier	Example
char	1 byte →	-128 to +127	%c	'a' , 'A'
unsigned char	1 byte →	0 to 255	%c	'a' , 'A'
int	2 byte	-32768 to +32767	%d	-25, 5, 0, -5
unsigned int	2 bytes	0 to 65535	%u	254, 36777
long int	4 bytes	-2147483648 to +2147483647	%ld	45l, -5l, 5000l
unsigned long	4 bytes	0 to 4294967295	%lu	1000l, 20000l
float	4 bytes	$\pm 3.4 \times 10^{\pm 38}$	%f	-3.5f, 125.13f
double	8 bytes	$\pm 1.7 \times 10^{\pm 308}$	%lf	-125.25 , 270.6
long double	10 bytes	$\pm 3.4 \times 10^{\pm 4932}$	%Lf	-330.45L, -1.2L

$$2^8 - 1 = 256 - 1 = 255$$

$$0 \rightarrow 255$$

$$-\frac{256}{2} = -128$$

$$255 - 128 = 127$$

↑  
0

int v1 = 10;

int v2 = 20;

int v3 = 30;

int v4 = 40;

int v5 = 50;

.

.

.



Single Array to store all values

Multiple variables  
to store each value