

# CS & IT ENGINEERING

## C Programming

C Tokens

Lecture No.- 01



By- Satya sir



# Recap of Previous Lecture



- Memory Layout of 'C' Program
  - High address
  - Stack
  - Heap
  - Uninitialized data, Initialized data
  - Code segment
- Structure of 'C' Program
  - Documentation section "
  - Linkage "
  - Macro definition "
  - Global declaration "
  - Main function "
  - Sub Program "

# Topics to be Covered



## 'C' Tokens

- What is a Token?
- How many Types, what are they?
- Identifiers
- Constants
- Keywords
- Examples







### What is Token?

- The Smallest Individual Element of any 'C' Program.
- So, Every 'C' Program is Collection of Tokens.
- In 'C' Language, There are 6 Types of Tokens.

- 1) Identifiers
- 2) Constants
- 3) Keywords
- 4) Strings
- 5) Operators
- 6) Special Symbols, Separators.



## Topic : C Tokens - 1



Example :

```
void main( )  
{  
    char x = 72 , y = 65 , z;  
    z = x;  
    x = y;  
    y = z;  
    printf(" x and y are %c, %c", x, y);  
}
```

void	char		Keywords		
main	x	y	z	printf	Identifiers
(	)	=	,		operators
{	;	}			Special Symbols
72	65				Constants
" x and y are %c, %c"					Strings





Identifiers : Name of any Programming Element

Variables

Arrays

Function

Pointer

Structure

Union

File

## Rules of Identifiers

- ① It should start with either alphabet (or) underscore ( \_ ) symbol.
- ② No space
- ③ No special symbol except underscore ( \_ )
- ④ Not be a keyword
- ⑤ Length of Name must not exceed 32 characters.

## Examples

- |    |                       |                                      |
|----|-----------------------|--------------------------------------|
| 1. | gate                  | Valid                                |
| 2. | GATE EXAM             | Invalid, space is not allowed        |
| 3. | GATE_EXAM             | Valid                                |
| 4. | _7                    | Invalid, must start with letter or _ |
| 5. | 7_                    | Valid                                |
| 6. | main                  | Valid                                |
| 7. | abc4def               | Valid                                |
| 8. | ____<br>3 underscores | Valid                                |

9. if

Invalid, keyword.

10. If

Valid



Keywords : A word, whose meaning/Purpose is already defined.

- These are also called as Pre-defined words (or) Reserved words
- In 'C' Language, 32 keywords are there.
- Each letter of keyword must be in lower-case (small letters)

Ex:

int → Keyword

Int → Not a keyword

INT → Not a keyword

iNT → Not a keyword



### C Language Keywords List

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





## Example 1

```
void main( )
```

```
{
```

```
    int  Int = 7, Int = 9, INT;
```

```
    INT = Int + Int;  7+9
```

```
    Int = INT * Int;  16*7
```

```
    INT = INT - Int * Int;  16 - 112*112 = 16 - 12544 = -12528
```

```
    Printf( "%d %d %d", INT, Int, Int );
```

```
}
```

What will be Printed?

-12528 112 16

Int  
7 112

Int  
9 16

INT  
-12528





## Topic : C Tokens - 1



Example 2 :

$$\begin{array}{r} \boxed{21} \\ 7203 \end{array}$$

$$\begin{array}{r} \boxed{42} \\ 147 \end{array}$$

$$\begin{array}{r} \boxed{9} \\ 336 \end{array}$$

$$\boxed{2413152}$$

long int        = 21,        = 42,        = 9,        ;

$$147 \leftarrow 9 * 21 - 42 \quad \underline{\quad} = \underline{\quad} * \underline{\quad} - \underline{\quad} ;$$

$$147 + 9 * 21 = 336 \quad \underline{\quad} = \underline{\quad} + \underline{\quad} * \underline{\quad} ;$$

$$336 * 21 + 147 = 7203 \quad \underline{\quad} = \underline{\quad} * \underline{\quad} + \underline{\quad} ;$$

$$\begin{array}{r} 7203 * 336 + 147 \\ - 7203 \\ \hline = 2413152 \end{array} \quad \underline{\quad} = \underline{\quad} * \underline{\quad} + \underline{\quad} ;$$

$$\underline{\quad} = \underline{7203}$$

$$\underline{\quad} = \underline{147}$$

$$\underline{\quad} = \underline{336}$$

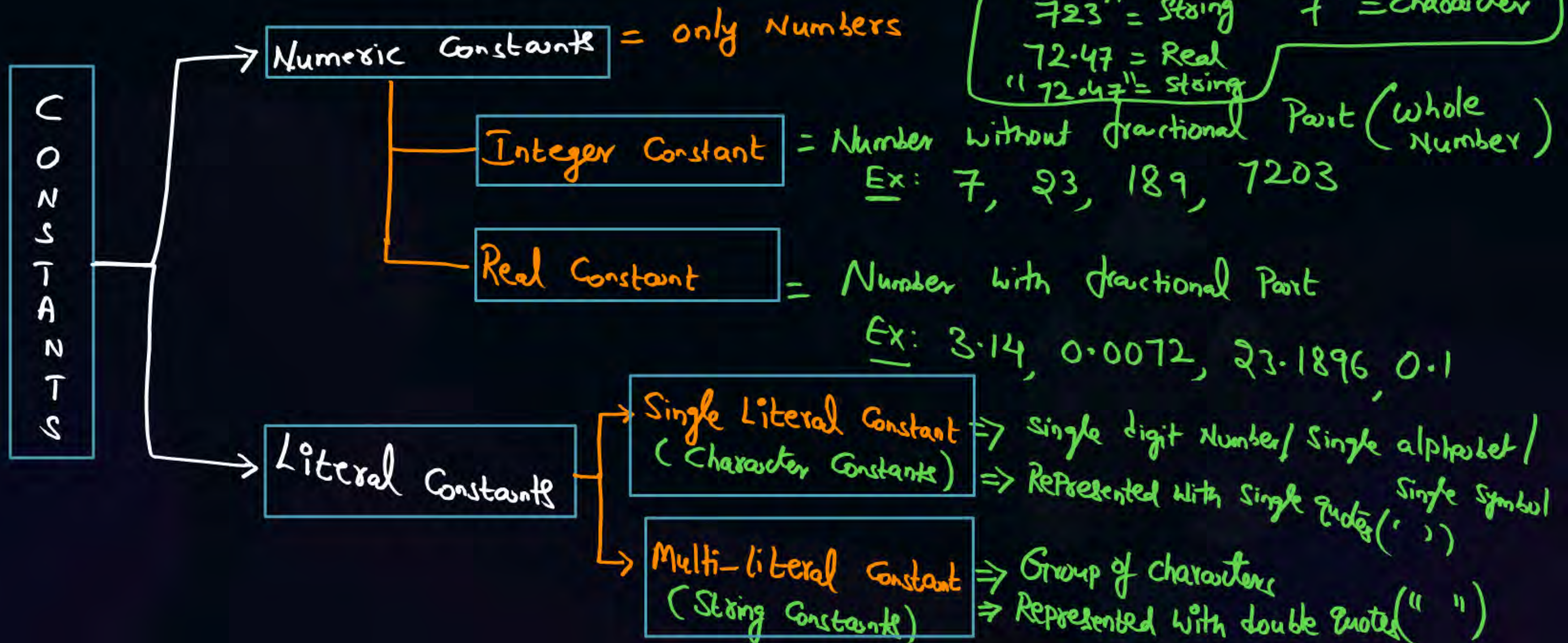
$$\underline{\quad} = \underline{2413152}$$





Constants  $\Rightarrow$  The data item, whose value is fixed (or) does not change.

Literal : A number (or) A symbol (or) A letter







## 2 mins Summary



### 'C' Tokens

- What is Token?
- Types
- Identifier, Rules, Examples
- Keywords
- Constants, String definition





**THANK - YOU**