



C Programming

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Tokens

- C program is made up of functions.
- Function is made up of statements.
- Statement contain multiple tokens.
 - Keywords
 - Data Types
 - Identifiers
 - Variables
 - Constants
 - Operators



Keywords

- Keywords are predefined words used in program, which have special meanings to the compiler.
- They are reserved words, so cannot be used as identifier.
- K & R C has 27 keywords. C89 added 5 keywords. C99 added 5 new keywords.

C89 = 32

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



Identifiers

- Identifiers give names to variables, functions, defined types and pre-processor macros.
- Rules of Identifiers:
 - Should start with alphabet or with _ (underscore)
 - Can include alphabets, _ (underscore), digits
 - Case sensitive
- Examples:
 - Var_1 //Valid
 - 1_var // Not Valid
 - _var //valid
 - Var-1 // invalid
 - Basic Salary //invalid



Data Types, Variables & Constants

- C allows computations to be performed on various types of data.
 - Numerical: Whole numbers, Real numbers
 - Character: Single character, Strings
- Fixed data values are said to be constants.
 - 12, -45, 0, 2.3, 76.9, 1.23456e+2, 'A', "Sunbeam", etc.
- Data is hold in memory locations identified by names called as variables.
 - Variable must be declared before its use in the program.
 - As per need, variable have some data type.
- Simple C data types are: int, double, char.
 - Data type represents amount of space assigned to the variable.
 - It also defines internal storage of the data.



printf()

- Arbitrary strings and variable values can be printed using printf() function.
 - int - %d
 - double - %lf
 - char - %c
 - ...
- Examples:
 - printf("Hello PreCAT @ Sunbeam");
 - printf("%d", roll_number);
 - printf("%d %lf %c", number, basic_salary, letter);
 - printf("Book price is %lf", price);
- Escape sequences
 - \n, \r, \t, \b, \a, \\, %%, \", \'



Data Types, Variables & Constants

- Variable examples
 - `int number = 10;`
 - `double basic_salary = 20000.0;`
 - `char letter = 'A';`
 - `int roll_number;`
 - `roll_number = 20;`
 - `double price = 200.0;`
 - `price = 300.0;`
- Constant examples
 - `-23, 1L, 34U, 3UL, 0x41, 0101,`
 - `1.234f, 1.234567e+2, ...`
 - `'A', "SunBeam"`
- Each variable is assigned some memory location.
- Size of data type of given variable or constant is found by `sizeof()` operator.



Data Types

- Data type defines storage space and format of variable.
- Primitive types
 - int
 - char
 - float
 - Double
- 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
- void type – represent no value.



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



Escape sequences

• \'	-	Single quotation mark	prints '
• \"	-	Prints Double quotation mark	prints"
• \\	-	Backslash Character	Prints\
• \a	-	Alert	Alerts by Generating beep
• \b	-	Backspace	Movers cursor one postion to the left of its current position
• \f	-	Form Feed	Moves cursor to the beginning of next page
• \n	-	New line	Moves cursor to the beginning of next line
• \r	-	Carraige return	Moves the cursor to the beginning of current line
• \t	-	Horizontal tab	Moves the cursor to next horizontal tab stop
• \v	-	Vertical tab	Vertical tab

Activate Windows
Go to Settings to activate Windows.



FORMAT SPECIFIERS

- char - %c
- int - %d,%i
- float - %f
- double - %lf
- long int - %ld
- short int - %hd
- unsigned long - ~~%hu~~ %lu
- unsigned short - %hu
- string type - %s
- Pointer type - %p





Thank you!

