"C" Programming in Basic
Unit-I

TOKENS IN "C"

- A Token is a group of Character that logically belong together.

=> A token is the smallest element of a Program that is meaningful to the Compiler.

There are Six type of Tokens.

(i) **Keywords**

Keywords are pre-defined or reserved words in a Programming language.

Examples. auto, break, int, struct, switch, register.

There are 32 Keywords in C.

(ii) **Identifiers**

A Symbolic Name is known as Identifier.

They are used as the general terminology for naming of variables, functions and arrays.

=> Prop. of Identifiers.

1.) Can Consist of Alphabets, digits, Underscore.
2.) Not Starting with Digits
3.) C is Case Sensitive
4.) Can be Start with ___ Underscore.
5.) Special Characters are not allowded.

(iii) **Constants**

Constant's Values Can not be modified by the Program once they are defined.

Constants refers to Fixed value.

(iv) **Strings**

=> Strings are Array of Characters ended with a null Character ('\0').

(V) Special Symbols

The following special symbols are used in C having some special meaning and thus, cannot be used for some other purpose. [ ] ( ) { } , ; * = #

(Vi) Operators

Operators are symbols that triggers an action when applied to C Variables and Other objects.

→ (i) Unary Operators
(ii) Binary Operators → Having 6 Types
(iii) Ternary Operators

Data types in "C"

BASIC, DERIVED AND USERDEFINED

Basic

∴ There are five atomic (fundamental) data types in C

- INT Data type: (For Integers)
- CHAR Data type: (For Characters)
- FLOAT Data type: (A Number having fractional part)
- DOUBLE Data type: (For double precision floating Point Number)
- VOID Data type: (For empty set of values and Non-returning functions)

Derived

- These data types are formed by a Combination of two or more primary data types.
  Examples. (i) Pointers (iii) Union
  (ii) Arrays (iv) Structure.

User Defined Data types

- => C Supports the features "typedef" that allows users to define the identifier which would represent an existing data type.
  This Defined data type can be Used to declare Variables.

Syntax:- typedef int numbers;
numbers num1, num2;

Other User defined data types: (i) Enum (Enumeration)

Syntax:- enum identifier (value 1, value 2....)

=> The main advantage of user defined data type is that it increases the program's readability.

BASIC INPUT AND OUTPUT STATEMENTS

An Input/Output statement or io statement is a portion of a program that instructs a Computer how to read and Process information.

=> Basic Input and Output functions in 'c':

(i) scanf() and printf() function under stdio.h

(ii) Getchar() and putchar() function

(iii) gets() and puts() function

ARITHMETIC EXPRESSION AND PRECEDENCE

Precedence of Operators :- The Most Important Thing.

1. **
2. *
3. /
4. +
5. -

- Compilation Process:- The Process of translating source code written in high level to low level machine Code is called as Compilation
- Object and Executable Codes:- After Preprocessing and Compilation process of a Program. We find object Code which is Computer understandable (Machine language) form. This is saved as .obj Extension.

The Object Code is linked using linker to form Executable program file. which is saved under .exe Extension.

Data types there Size and Range

TYPE	STORAGE SIZE	VALUE RANGE
1.) Char	1 Byte	-128 to 127
Unsigned Char	1 Byte	0 to 255
Signed Char	1 Byte	-128 to 127
2.) Int	2 Bytes	-32768 to 32767
Unsigned int	2 Bytes	0 to 65,535
3.) short	2 Bytes	-32,768 to 32,767
Unsigned short	2 Bytes	0 to 65,535
Long	4 Bytes	-21,147,483,648 to 2147483647
Unsigned Long	4 Bytes	0 to 4,294,967,295
4.) Float	4 byte	3.4×10^{-36} to $3.4 \times 10^{38} - 1$
Double	8 byte	1.7×10^{-308} to $1.7 \times 10^{308} - 1$
Long double	10 byte	3.4×10^{-4932} to $1.1 \times 10^{4932} - 1$

- **ERRORS IN "C"**

1) Syntax Errors:- Errors that occur when you violate the rules of writing C/C++. (Missing Parenthesis, semicolon)
2) Run-time Errors:- Errors which occur during program Execution after successful Compilation. (Division by Zero)
3) Linker Errors:- These are errors generated when the executable of program cannot be generated. (Wrong Prototyping, incorrect header files)
4) Logical Errors:- On Compilation and Execution of a Program, desired output is not obtained. (Logical thinking)
5) Semantic Errors:- This Error occurs when the statements written in the Program are not meaningful to the Compiler

TYPE CONVERSION IN "C"

- A Type Casting or Type Conversion basically a Conversion from one type to another
There are two type of type Conversion.

(i) Implicit type Conversion
Also Known as "Automatic Type Conversion"
- Done by Compiler on its own, without any external trigger from user.
- Generally takes place when in an expression more than one data type is present.

(ii) Explicit type Conversion
This process is also Called type Casting and it is user defined. Here, User can type Cast the result to make it of a particular data type.

Syntax: (type) Expression
Final Result data type

Advantages:- • Advantage of Certain features of Type Representations
• Compute expression with different Variables

"Header Files"

A Header File is a file with extension .h which Contain C function declerations and macro definitions to be shared between several source files.
Including a header file is equal to Copying the Content of the header file.
There are two types of header files:-
(i) That Programmer's write
Syntax: #include "File"
(ii) That Come with Compiler
Syntax: #include<File>

Storage Classes in "C"

Storage Classes are used to describe about features of variable / function.

There are four type of Storage Classes.

(i) Auto :- This is default storage class for all the variables declared inside a function.

(ii) Extern :- This Class simply tells us that the variable is defined elsewhere and not within the same block.

(iii) Static :- This Storage Class is used to declare static variables which are popularly used while writing program in C.

(iv) Register :- This Class Declares Register variables which have the same functionality as that of auto variables