**C PROGRAM**

**C language was developed in 1972 by Dennis Ritchie.**

* It took 3 years, 8 months for developing the C.
* Business package – Excel, Notepad
* Programs written in C are much faster & efficient.
* Highly Portable.
* Basic structure of C program:
* Documentation Section: /\* --description, author, DOC/DOM, Version \*/

/\*

* + - Description: modules add,sub
    - int add (int val1, int val2); add is along addition of val1 with val2 and return the result to the main
    - Author: BT
    - DOC/DOM: 29/10/2024
    - Version: 0.1v
    - 1.0---- stable version –basing of the project

\*/

* Whenever we push the code it will become read only.
* Link Section ----- Including header files.
* Definition Section----- defining the prototype of function & macros.
* Global Declaration Section : Variable declaration, static, local
* Function Section----Every function has it’s own address.
* main()

{ Declaration part

Executable part

}

**CONSTANTS, VARABLES & DATATYPES:**

**Character Set:**

* + Letters (A-Z, a-z)
  + Digits (0-9)
  + Special Characters (!, @, #, $, %, &….)
  + White Spaces (blank spaces, tab, carriage return, new line\n, /r – same line first position)

**CTOKENS:** The smallest individual units in a program are known as Tokens.

They are:

* + - Keyword --- Reserved word(32 reserved words)
    - Identifiers---- Variable name
    - Constants----The value doesn’t change at run time
    - Strings---- Collection of characters enclosed with double quotes
    - Special Symbols-------$, &,@.......
    - Operaters------ 1.Arthimentic Operaters: +,-,\*,%

2. Relational Operaters: >,<, >=, <=,!=

3. Assignment Opersters: +=.-=,\*=,%=,=,/=

* + - Logical Operaters: &&, ||, !
    - Bitwise Operaters: <<, >>, &, |, ^, !

**EX:**

int a=10;

if( !a)

{ printf(“h”):

}

else {

printf(“N”);

**Display 2 table by using bitwise operaters?**

number = 5 # Change this to any number you want

for i in range(1, 11): # Generate the table from 1 to 10

a = number

b = i

result =0

* while b > 0:

if b & 1: # Check if the least significant bit is set

* result += a # Add 'a' if the current bit of 'b' is 1

a <<= 1 # Double 'a' (equivalent to a \* 2)

b >>= 1 # Halve 'b' (equivalent to b // 2)

print(f"{number} x {i} = {result}")

**DATA TYPES:**

* C language is rich in it’s datatypes. ANSI c supports the following data types.
* Primary datatypes
* User-defined datatypes
* Derived datatypes

**1)Primary datatypes:**

**NAME SIZE RANGE OF VALUES**

char 1 -128 TO 127

int 2 -32,768 to 32,767

float 4 3.4e -35 to 3.4e +38

double 8 1.7e -308 to 1.7e +208

**2)User-defined datatypes:** a)Structures

b)Unions

c)enum

**3)Derived datatypes:** a) Array

b)Function

**MODIFIERS:** The basic datatypes may have several modifiers preceding them to serve the needs of various situations. They are:

a)Signed

b)Unsigned

c)long

d)short

* May be applied to character and integer datatypes. However, the modifier long may also applied to double.

**NAME SIZE RANGE OF VALUES**

Unsigned char 1 0 to 255

Signed char 1 -128 to 127

Unsigned int 2 0 to 65535

Signed int 2 -31768 to 32767

Short int 2 -31768 to 32767

Long int 4 ------------------

Long double 10 ------------------

**INCREMENT & DECREMENT:**

* Pre-Increment------- ++a
* Post-Increment------ a++
* Pre- Decrement------ --a
* Post-Decrement------ a—

**EX:**

int a= 10;

int b= 20;

int c= a++;

++a;

c++;

b= ++c;

printf(“\n %d %d %d”, ++a, ++b, ++c);

**OUTPUT:** 13 12 13

**TERENARY OPERATER:** option1? (option2) : (option3)

* Option1 ----- Condition
* Option 2------ If the condition is true then it will execute
* Option 3----- If the condition if false then it will execute

**EX:** Greatest of three numbers using terenary operater

int a=10;

int b=20;

int c=30;

int d=40;

res = (a>b)?((a>c)? a : c) : ((b>c)? b : c);

printf(“\n %d”, res);

**OUTPUT:** 40

**SIZEOF—OPERATER:** It gives number of bits the datatype consumes.

**EX:** printf(“%d”, sizeof(int));