Bismillahir Rahmanir Rahim

16 January, 2022

Book's Name: Tour with C

Published By: Mohammad Arefin Hossain

Gmai : arefinstudent71@gmail.com

Linkedin: https://www.linkedin.com/in/arefin-hossain-253b41208/

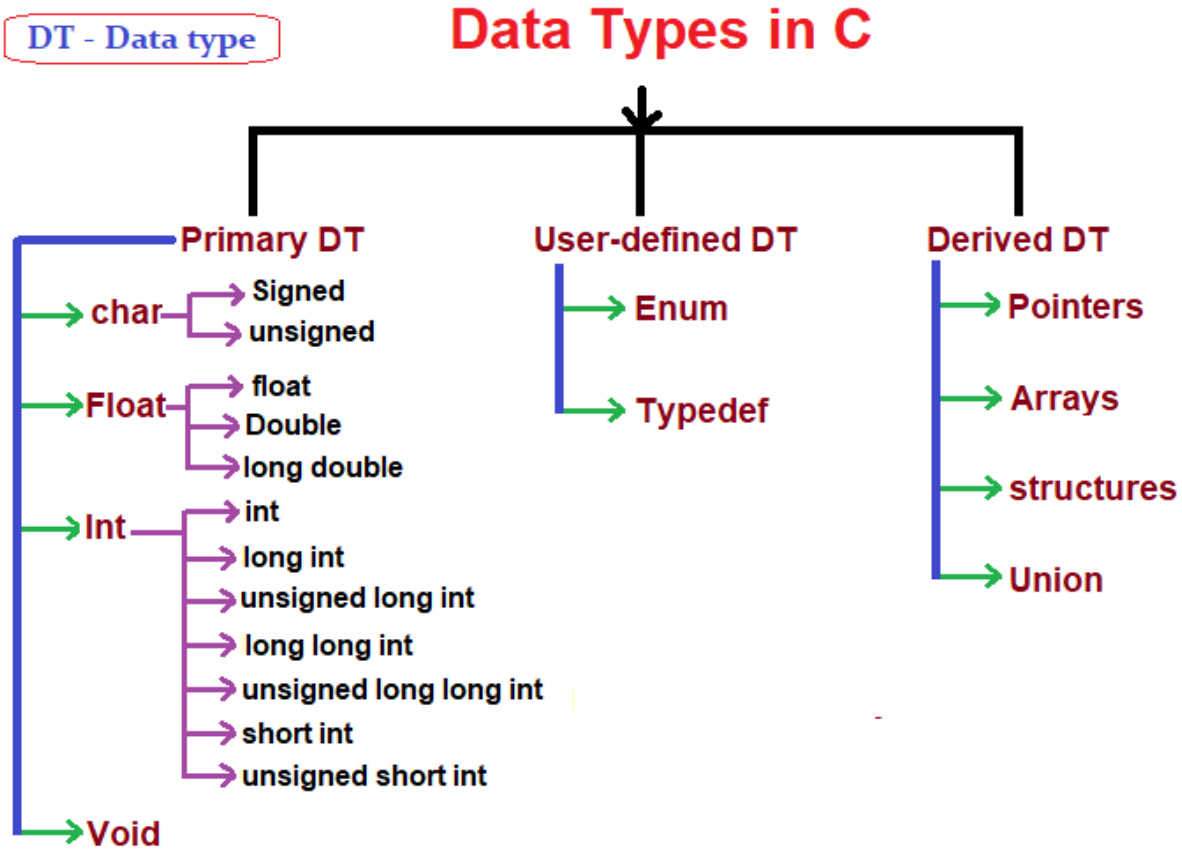
Github : https://github.com/arefinthecybersec

Fb Page : https://www.facebook.com/profile.php?id=100077283654818

Contents:

Recommended For: Basic & New-Comer C Programme LearneR

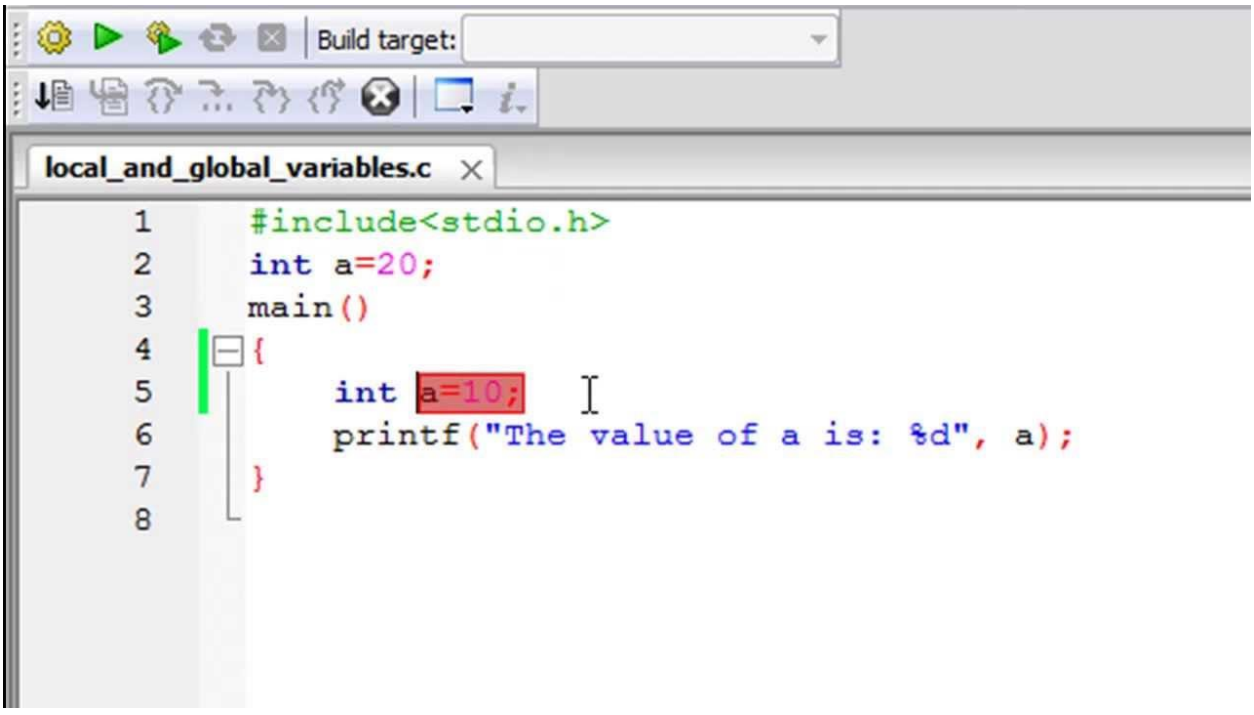
DATATYPE


DT - Data type
Data Types in C
Primary DT
User-defined DT
Derived DT
char
Signed
unsigned
Float
float
Double
long double
Int
int
long int
unsigned long int
long long int
unsigned long long int
short int
unsigned short int
Void
Enum
Typedef
Pointers
Arrays
structures
Union

Data Type	Range	Bytes	Format
signed char	-128 to + 127	1	%c
unsigned char	0 to 255	1	%c
short signed int	-32768 to +32767	2	%d
short unsigned int	0 to 65535	2	%u
signed int	-32768 to +32767	2	%d
unsigned int	0 to 65535	2	%u
long signed int	-2147483648 to +2147483647	4	%ld
long unsigned int	0 to 4294967295	4	%lu
float	-3.4e38 to +3.4e38	4	%f
double	-1.7e308 to +1.7e308	8	%lf
long double	-1.7e4932 to +1.7e4932	10	%Lf
Note: The sizes and ranges of int, short and long are compiler dependent. Sizes in this figure are for 16-bit compiler.			

- ***Resource:***

BASIC OF VARIABLE & CONSTANT



- ***Resource:***

OPERATOR

- ***Resource:***

TYPECASTING

- ***Resource:***

LIBRARY-FUNCTION

- ***Resource:***

*Try to solve this problem:- URI ONLINE JUDJE

URI 1013, 1018, 1019, 1012, 1014, 1016, 1017

RELATIONAL AND- LOGICAL OPERATORS

- ***Resource:***

IF-ELSE STATEMENT

Bangla

- ***Resource:***

English

- ***Resource:***

*Finding maximum: Resource
*Finding divisibility: Resource
*Assignment Operator: Resource
*Increment-Decrement: Resource

TYPE-CASTING

- ***Resource:***

POST & PRE-INCREMENT

- ***Resource:***

TERNARY-OPERATOR

- ***Resource:***

BASIC DATATYPES{*char}

Class: Jamil As-ad sir

SWITCH-CONTINUE- GOTO-DO.WHILE

Class: Jamil As-ad sir

PATTERN PRINTING

- ***Resource:***

YOUTUBE: Anisul Islam
https://www.youtube.com/watch?v=irzvR4VEt4M&list=PLgH5QX0i9K3oTxQhx2kejYmQn6qtRULCD

BASIC DATATYPES{*char}

Class: Jamil As-ad sir

SWITCH-CONTINUE- GOTO-DO.WHILE

Class: Jamil As-ad sir

Try to solve this problem using with Loop:

[219432Y-Easy Fibonacci]
(https://codeforces.com/group/MWSDmqGsZm/contest/219432/problem/Y)
[219432J-Primes from 1 to n]
(https://codeforces.com/group/MWSDmqGsZm/contest/219432/problem/J)
[219432G-Factorial]
(https://codeforces.com/group/MWSDmqGsZm/contest/219432/problem/G)
[219432I-Palindrome]
(https://codeforces.com/group/MWSDmqGsZm/contest/219432/problem/I
[219432L-GCD]

(https://codeforces.com/group/MWSDmqGsZm/contest/219432/problem/L)

ARRAY

Class: 1D-array Jamil As-ad sir

Class: 2D-array Jamil As-ad sir

YOUTUBE: Anisul Islam

https://www.youtube.com/watch?v=NynMXcUGjKQ&list=PLm6UpFb35TJ5DPHTrKdCRSntSzDymW0hN

Try to solve this proble using with Array:

[219774D-Positions in array]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/D)
[219774E-Lowest Number]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/E)
[219774F-Reversing]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/F)
[219774H-Sorting]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/H)
[219774L-Max Subarray]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/L)
[219774M-Replace MinMax]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/M)
[219774S-Search In Matrix]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/S)
[219774V-Frequency Array]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/V)
[219774Z-Binary Search]
(https://codeforces.com/group/MWSDmqGsZm/contest/219774/problem/Z)

STRING

1D-string: YOUTUBE: Anisul Islam

2D-string:

https://drive.google.com/file/d/1Uky75GO6p6bP1OgNNUmnFLy_iGMZLD2p/view

Try to solve this proble using with String:

[219856C-Compare]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/C)
[219856F-Way Too Long Words]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/F)
[219856H-Good or Bad]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/H)
[219856J-Count Letters]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/J)
[219856K-I Love strings]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/K)

[219856L-String Functions]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/L)
[219856O-Sort String]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/O)
[219856R-String Score]
(https://codeforces.com/group/MWSDmqGsZm/contest/219856/problem/R)

FUNCTION

- ***Resource:***

Try to solve this proble using with Function:

[223205D-Prime Function]
(https://codeforces.com/group/MWSDmqGsZm/contest/223205/problem/D)
[22320E-Swap]
(https://codeforces.com/group/MWSDmqGsZm/contest/223205/problem/E)
[22320G-Max and MIN]
(https://codeforces.com/group/MWSDmqGsZm/contest/223205/problem/G)
[22320K-Shift Right]
(https://codeforces.com/group/MWSDmqGsZm/contest/223205/problem/K)

RECURSSION

- ***Resource:***
- ***Resource:***

Try to solve this proble using with Recurssion:

[223339C-Print from N to 1]
(https://codeforces.com/group/MWSDmqGsZm/contest/223339/problem/C)
[223339D-Print Digits using Recursion]
(https://codeforces.com/group/MWSDmqGsZm/contest/223339/problem/D
[223339E-Base Converssion]
(https://codeforces.com/group/MWSDmqGsZm/contest/223339/problem/E)
[223339J-Factorial]
(https://codeforces.com/group/MWSDmqGsZm/contest/223339/problem/J)

FILEHANDLING

Part1: https://drive.google.com/file/d/1CruWbmNeGhlfzkotfXkc7q_9ALrOPhkK/view
Part2: https://drive.google.com/file/d/1ctQXf2IVzYLHxy9eD_ICwR_P--EFaAu-/view
Part3: https://drive.google.com/file/d/1NJ-r6u-hQ_5mdfgOvVPNDmgaPo3EEoOY/view

Suppose, you are a software engineer at Google and responsible for creating a basic version of Google Classroom. There could be information of thousands of courses. Each course may contain several students and only one instructor/teacher. For each course, you have to keep a record of its Course Code, Course Name, Section, Instructor's Name, Number of Enrolled Students and a list of the IDs of the enrolled students. You have to save the information of all the courses in a file named "classDB.txt".
Here is a sample for the "classDB.txt" file. We will refer to this in question 1, 2 and 3.

```
CSE-1121
Computer Programming 1
B
JAA
4
C213050 C213052 C213055 C213063
MATH-1107
Mathematics 1
C
MRI
3
C213091 C213092 C213099
CSE-2311
Data Structure
A
MSA
5
C211001 C211010 C211015 C211021 C211030
CSE-4875
Pattern Recognition and Fuzzy System
A
JAA
0
CSE-1121
Computer Programming 1
C
JAA
3
C213091 C213092 C213099
```

Following is an explanation for a particular course information. Consider the first one:

CSE-1121
Computer Programming 1
B
JAA
4
C213050 C213052 C213055 C213063

Here the first string **"CSE-1121"** represents the **Course Code** of the course.

The second, third and fourth lines represent the **Course Name, Section and Instructor's Name** of the course respectively.

The fifth line contains an integer representing the number of enrolled students that this particular course has (in this case 4 students have enrolled for **CSE-1121**, **Section-B**). And next line is a list containing the student IDs of the enrolled students.

*If there are no enrolled students then the fifth line should contain 0 and the nextline will be the beginning of another record [See the record of **"CSE-4875"**, forexample].*

Now build a system where you will be given information of several courses. You have tosave information of all the courses in a file named **"classDB.txt"**.

1. a) Create a **structure** called **Course** which will contain necessary fields to hold theinformation of a particular Course. Use an array of type of this structure to solve theproblems in questions **1-b and 1-c**.

b) Show **Course Code**, **Course Name**, **Section** and **Number of Enrolled Students** of all courses **taken by a particular teacher**.

Suppose you are given **"JAA"** as input. Considering the file **"classDB.txt"**, the following should be the output:

Code: CSE-1121
Name: Computer Programming 1
Section: B
Number of Students: 4

Code: CSE-4875
Name: Pattern Recognition and Fuzzy System

Section: A
Number of Students: 0
Code: CSE-1121
Name: Computer Programming
Section: C
Number of Students: 3

c) Add information of a new course to the ***"classDB.txt"*** file. Make a function named **addInfo()** to do so. If the ***"classDB.txt"*** file doesn't exist on the machine, **create a new file** with this name.
This function should take all the necessary inputs i.e. **Course Code, Course Name, Section, Instructor's Name** from the keyboard. Initially the **Number of Enrolled Students** should be **0**.

2. a) Suppose you are given the **matric ID** of a student, a particular **Course Code** and **Section** as input. Now add this student to this particular course i.e. the matric ID should now appear on the **enrolled student ID list** of this course and the total number of enrolled students should **increase by 1**.

For the following input **"C213070 CSE-1121 B"**, the first course info in the **"classDB.txt"** file should change into:

CSE-1121
Computer Programming 1
B
JAA
5
C213050 C213052 C213055 C213063 **C213070**

b) Delete information of all the courses that has no students enrolled yet.
Considering the **"classDB.txt"** file only the information of the course **CSE-4875** will be deleted in this case.

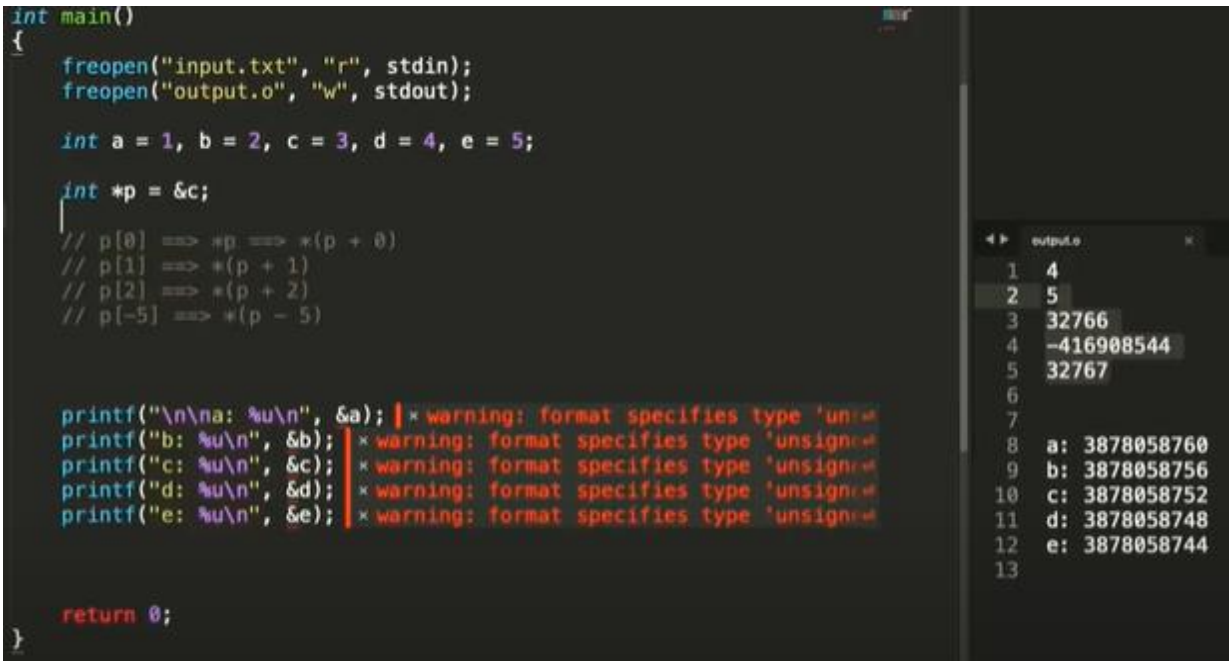
POINTER

Agenda:

1.Pointer and its basics

2. Benefits of pointer - swap function and using & in scanf function
3. Pointer Arithmetic
4. Arrays are pointers!! (But less powerful.

*pointer with address check:



Explaination:

- (int *p) is a pointer, where (&c) is located it.
- (*p /*p==p[0] /p[0]) both of them denote is simillar.
- [+]symbol denoted backward address; [-]>>frontward.
- int pointer allocated -4 byte of memory,
  char=1 byte,double=8byte.

*<u>Array is one of pointer</u>

```
int arr[100] = {1, 4, 7, 19};
p = arr;
//              0  1  2  3


printf("%d\n", arr[0]);
printf("%d\n", arr[2]);

printf("%d\n", p[0] );
printf("%d\n", p[2] );


return 0;
```

```
1  1
2  7
3  1
4  7
5
```

*__String__ is one kind of char Array. So, its deserves a address hold. So that, we write: (“%s”, str) …no necessary write: &str!

```
int str[100];
scanf("%a", str);
```

*We know, str cnt in [0]-index. If we need [1] index to it starting than write this approach: (str+1)=[1-index].
*(&str[1])..hcce atr alternative notation!

```
char str[100] = "Hello";
// str  [ _ _ _ _ _ _ ]
//        0 1 2 3 4 5

scanf("%s", str + 1);
scanf("%s", &str[1]);

// arr[0],   arr[1],   arr[2]
// *(arr+0)  *(arr+1)  *(arr+2)

for(int i = 1; i < strlen(str); i++)
    printf("%c", str[i]);
```

```
output.o
1  hello
```

*Normal array has less power as a pointer! If array we don’t directly exchange one var it for others. But, pointer is it plus point!

```
int a[100], b[100], n;
int *p;

p = a;

p = b;

f(a, n);
```

*If we need **variable size of array**, than replace it to the pointer. Ex. below:

```
int* p;
// double* q;
// char* x;
int arr[100] = {3, 1, 5, 3};
// int a = (int) 3.5;
int n = 100;
p = (int*) malloc( n * sizeof(int) );


scanf("%d", &n);
for(int i = 0; i < n; i++)
    scanf("%d", &p[i]);

for(int i = 0; i < n; i++)
    printf("%d ", p[i]);
```

```
output.o
1  2 5 1 3 7
```

*Ways of **returning multiple values** from a function. We know a function didn't return multiple value.

Approach: 1(Using-Structure)

```
struct point{
    int x, y;
};
// int x, y;
struct point inc(int a, int b)
{
    struct point t;
    t.x = a + 1;
    t.y = b + 1;

    return t;
    // (*q)++;
    // x = *p;
    // y = *q;
}

int main()
{
    freopen("input.txt", "r", stdin);
    freopen("output.o", "w", stdout);
    int a = 20, b = 13;

    struct point p = inc(a, b);
```

```
output.o
1  21 14
```

```
void inc(int *p, int *q)
{
    (*p)++;
    (*q)++;
    // x = *p;
    // y = *q;
}
```

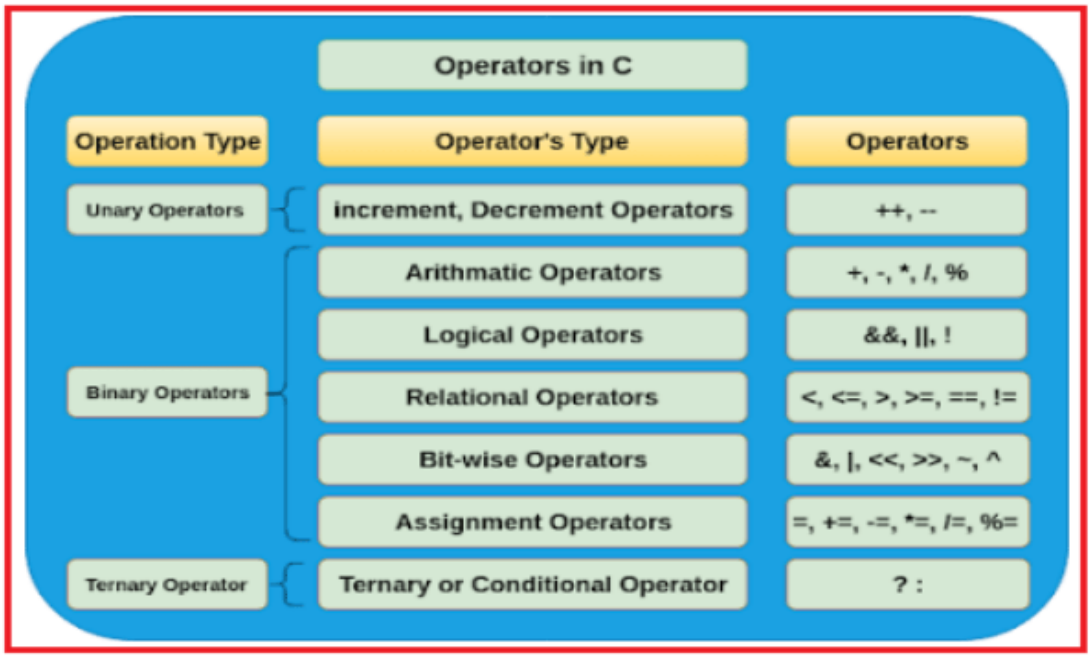
```
output.o
1  3 4
```

(Using-Pointer)

(Using-Global Var)

.....

BITWISE OPERATOR



- ***Resource:***

***Binary** Operator work with around of two-operand:

AND(&)---If both of them Var is 1, than write='1' else ='0'

OR(||) ---If both of them Var has One value is 1, than write='1' else ='0'

XOR(^) ---If both of them is similar than write='0' else ='1'

***Unary** operator work with 1 var. Ex: (~a)

NOT(~) ---If both of them is similar than write='0' else ='1'

***Left Shift:**

n=3, x=0000110;

n>>x;

=> 0000110; => 0011000


#include<string.h>
#include<stdlib.h>
int main()
{
freopen("input.txt", "r", stdin);
freopen("output.o", "w", stdout);
int a = 7, n = 3, c;
c = (a & (1 << n));
if(c != 0) {
printf("Set");
}
else {
printf("Unset");
}
// printf("%d", c);
return 0;
}
Left shift and
Right shift using:
..000000001 -- 1
..000001000 -- (1 << n)
..000000111 -- 7
..000000000 -- zero
..876543210
Unset


IUC

You only fail,

When you stop TRYING!

T H E E N D