



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECB211 – Microcontroller Programming & Interfacing

II YEAR/ IV SEMESTER

UNIT 3 – PIC PROGRAMMING IN C

TOPIC 3 – Logic Operations in C



Logic Operations in C



- Logical operators in C are used to combine multiple conditions/constraints.
- Logical Operators returns either 0 or 1, it depends on the expression result true or false.
- In C programming for decision-making, we use logical operators.
- We have 3 major logical operators in the C language

Logical AND (&&)

Logical OR (||)

Logical NOT (!)

Logical XOR(^)



Types of Logical Operators



1. Logical AND Operator

If both operands are non zero then the condition becomes true. Otherwise, the result has a value of 0. The return type of the result is int. Below is the truth table for the logical AND operator.

X	Y	X&&Y
1	1	1
1	0	0
0	1	0
0	0	0

Syntax:

```
(condition_1 && condition_2)
```



Types of Logical Operators



```
// C program for Logical
/ AND Operator
#include <stdio.h>

// Driver code
int main()
{
    int a = 10, b = 20;

    if (a > 0 && b > 0)
    {
        printf("Both values are greater than 0\n");
    }
    else
    {
        printf("Both values are less than 0\n");
    }
    return 0;
}
```

Output : Both values are greater than 0



Types of Logical Operators



2. Logical OR Operator

The condition becomes true if any one of them is non-zero. Otherwise, it returns false i.e, 0 as the value. Below is the truth table for the logical OR operator.

X	Y	X Y
1	1	1
1	0	1
0	1	1
0	0	0

Syntax:

`(condition_1 || condition_2)`



Types of Logical Operators



```
// C program for Logical
// OR Operator
#include <stdio.h>

// Driver code
int main()
{
    int a = -1, b = 20;

    if (a > 0 || b > 0)
    {
        printf("Any one of the given value is "
            "greater than 0\n");
    }
    else
    {
        printf("Both values are less than 0\n");
    }
    return 0;
}
```

Output : Any one of the given value is greater than 0



Types of Logical Operators



Logical NOT Operator

If the condition is true then the logical NOT operator will make it false and vice-versa. Below is the truth table for the logical NOT operator

X	!X
0	1
1	0

Syntax:

```
!(condition_1 && condition_2)
```



Types of Logical Operators



```
// C program for Logical
// NOT Operator
#include <stdio.h>
// Driver code
int main()
{
    int a = 10, b = 20;
    if (!(a > 0 and b > 0))
    {
        // condition returned true but
        // logical NOT operator changed
        // it to false
        printf("Both values are greater than 0\n");
    }
    else
    {
        printf("Both values are less than 0\n");
    }
    return 0;
}
```

Output

Both values are less than 0



Types of Logical Operators



4. XOR (^) Logical Operator:

If both bits are the same then it will return false otherwise true. Below is the truth table for the logical XOR operator

X	Y	X^Y
0	0	0
0	1	1
1	0	1
1	1	0

Syntax:-

`((condition1) ^ (condition2))`



Summary of Special Characters in C



```
// C program for Logical
// XOR Operator
#include <stdio.h>
// Driver code
int main()
{
    int a = 11, b = 11;
    printf("%d\n", a^b);
    return 0;
}
```

Output : 0



THANK YOU