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CPA: PROGRAMMING IN C

Developed As Additional Instructor Led Slides For CPA: Programing Essentials In C
Cisco NetAcademy <https://www.netacad.com/>

Supplemental Slides Developed by topClown@SteamClown.org



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COMPUTERS AND THEIR LOGIC

Module 3.5

LOGICAL OPERATORS

- AND Operator

- Conjunction = the requirement that an action or an instance of two or more events or things occurring at the same point in time or space
- *If we have **cereal**, and **milk**, we can have breakfast.*

- OR Operator

- Disjunction = the relationship between two distinct alternatives, without the requirement of one effecting the other
- *If you are in the mall or I am in the mall, one of us will buy a gift for Mom.*



AND ↔ &&

- && Operator
- endOfWorld == 1 AND lifeForce must be greater than 10
- Putting () && () is a good idea

```
// Example program
#include <stdio.h>
int endOfWorld = 1;
int lifeForce = 9;

int main()
{
    if(endOfWorld == 1 && lifeForce > 10)
    {
        // your code here
        puts("Hello and good luck");
    }
    else
    {
        puts("sorry dude...");
    }
}
```

```
if((endOfWorld == 1) && (lifeForce > 10))
```



AND TRUTH TABLE

- Only when Variable 1 AND Variable 2 are TRUE will output be TRUE

Variable 2	Variable 1	Output
False	False	False
False	True	False
True	False	False
True	True	True



OR ↔ ||

- || Operator
- If endOfWorld is = 1, but either timeMachine **OR** powerFist is = 1, then you still “Escaped”

```
#include <stdio.h>
int endOfWorld = 0;
int timeMachine = 1;
int powerFist = 0;

int main()
{
    if(endOfWorld == 0)
    {
        puts("The END is near...");
    }
    else if(((endOfWorld == 1) && (timeMachine == 1))
            || ((endOfWorld == 1) && (powerFist == 1)))
    {
        puts("Luck, you escaped...");
    }
    else
    {
        puts("Sorry Dude...");
    }
}
```



OR TRUTH TABLE

- Any time Variable 1 or Variable 2 are TRUE will output be TRUE

Variable 2	Variable 1	Output
False	False	False
False	True	True
True	False	True
True	True	True



NOT!

- ! Operator
- The “!” inverts or “NOTs” the Argument
- Turns TRUE to FALSE and FALSE to TRUE

!endOfWorld

```
// Example program
#include <stdio.h>
int endOfWorld = 0;
int timeMachine = 0;
int powerFist = 0;

int main()
{
    if(!endOfWorld)
    {
        puts("The END is near...");
    }
    else if((timeMachine == 1) || (powerFist == 1))
    {
        if(endOfWorld == 1)
        {
            endOfWorld = !endOfWorld;
        }
        puts("Luck, you escaped...");
        printf("endOfWorld = %d", endOfWorld);
    }
    else
    {
        puts("Sorry Dude...");
    }
}
```



NOT TRUTH TABLE

- What is the value of myStatus?

Argument	!Argument
TRUE	FALSE
FALSE	TRUE

myStatus = !endOfWorld

- What about endOfWorld?

endOfWorld = !endOfWorld



LAB

- Create a new program that incorporates &&, ||, !
- Don't just copy mine... you can use them as an example
- For example:
 - If a boat has Pandas and Unicorns, it can't sink... Unless it has a Troll as a captain...
 - A conveyor belt will turn on if there is an object at Position1 or Position2, but will stop if there is an Position3, or if the EmergencyStop is pushed.





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