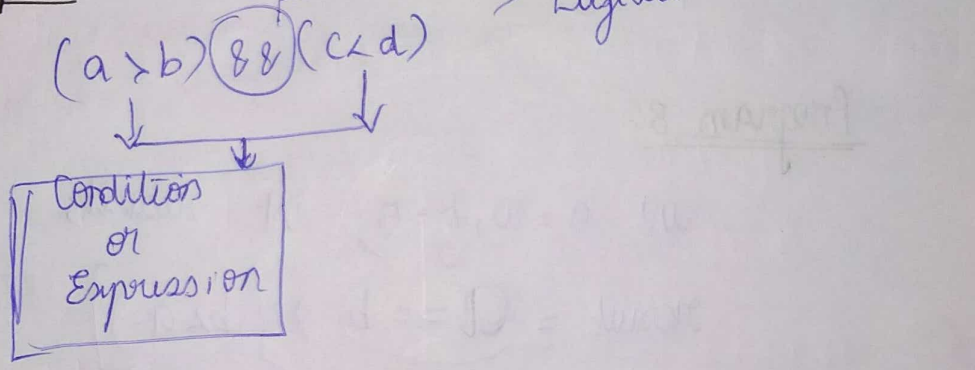
C_17 => Operators in C - Part 5

[Logical Operators]

Logical operators:

* Used to check more than one condition
* 3 Logical operators
  - ↳ && (AND)
  - ↳ || (OR)
  - ↳ ! (NOT)

Example:1



Example:2

```
int a=10, b=5;
a && b ; 10 && 5 ; a==b && b<a
```

Logical AND: (&&)

* If any one of the expression or operand is false then whole Condition is false
* Value of expression gets evaluated until it reaches true, and rest are not evaluated

Program 1:

```
int a = 10, b = 5;
int result;
result = (a>b) && (b!=10) && (b<11) && (a>5)
printf("%d", result);
```

⇒ 1

Program 2:

```
int a = 10, b = 5;
int result;
result = (a>b) && (b!=10) && (b<11) && (a<5)
printf("%d", result);
```

⇒ 0.

Program 3:

```
int a = 10, b = 5; int result;
result = (a==b) && (b<a)
printf("%d", result);
```

↳ it will get evaluated

⇒ 0.

Logical OR (||)

* If any one of the expression or operand is true, then whole condition gets true.
* Value of expression gets evaluated until it reaches true and rest of the condition not evaluated.

Program 1:-

```
int a=10, b=5, result;
result = (a<b) || (b==4)
          0        0
printf("%d", result); ⇒ 0.
```

Program 2:-

```
int a=10, b=5, result;
result = (a>b) || (b==4)
          1
```

not get evaluated.

```
printf("%d", result); ⇒ 1
```

Logical NOT (!)

* It is complement of the expression.
* If the expression is true, then result is false or vice versa.

Program 1:-

```
int a=10, b=5, result;
result = !(a>b);
          1
printf("%d", result); ⇒ 0
```

* It complements the expression; and gives 0.

Logical AND.

A	B	A && B
0	0	0
0	1	0
1	0	0
1	1	1

Logical OR

A	B	A || B
0	0	0
0	1	1
1	0	1
1	1	1

Logical NOT

A	!A
0	1
1	0

Programs

①
```
main()
{
  int a=4, b=6, result;
  result = (a>b) && printf("Jenny");
  printf("%d", result);
}
```
0 → printf not evaluated → ⇒ 0.

②
```
main()
{
  int a=4, b=6, result;
  result = (a<b) && printf("Jenny");
  printf("%d", result);
}
```
1 1 ⇒ Jenny 1

③
```
main()
{
    int a=4, b=6, result;
    result = a>b && printf("Jenny") || printf("Lectures");
    printf("%d", result);
}
```
0 1 ⇒ Lectures 1

④ ⑤
```
main()
{
    int a=4, b=6, result;
    result = a>b && printf("Jenny") || printf("Lectures")
                 && printf("JK");
    printf("%d", result);
}
```
a<b ⇒ Jenny 1

⑥ ⑦
```
main()
{
    int a=4, b=6, result;
    result = a>b && printf("Jenny") || printf("Lectures") ||
                                       printf("JK");
    printf("%d", result);
}
```
a<b ⇒ Jenny 1

(8) main()
{
int a=4, b=6, result;
printf("%d", 4 && !0); ⇒1
printf("%d", 4 && 0); ⇒0
}

(9) main()
{
int a=10, b=5, result;
result = (a>b) && a++;
10>5.
printf("%d", result); ⇒1
printf("%d", a); ⇒11
}

a: 10 → 11 (10)
b: 5

(10)
main()
{
int a=10, b=5, result;
result = (a<b) && a++;
10<5
printf("%d", result); ⇒0.
printf("%d", a); ⇒10
}

a: 10 (10)
b: 5.

(11) main()
{
int a=10, b=5, result;
result = (a>b) || a++;
10>5
printf("%d", result); ⇒1
printf("%d", a); ⇒10.
}

a: 10 (10)
b: 5

(12) main()

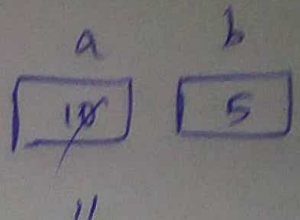
{

int a=10, b=5, result;

result = (a<b) || a++;

printf("%d", result); ⇒ 1

printf("%d", a); ⇒ 11



(13) main()

{

int a=1, b=b;

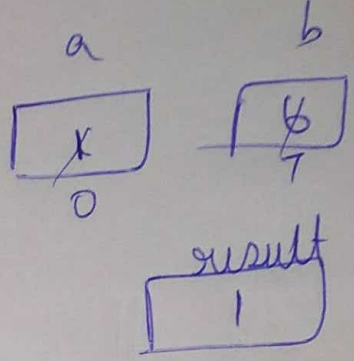
result = a-- && ++b;

printf("%d", result); ⇒ 1

%d", a ⇒ 0

%d, b ⇒ 1

}



(14) main()

{

int a=1, b=b;

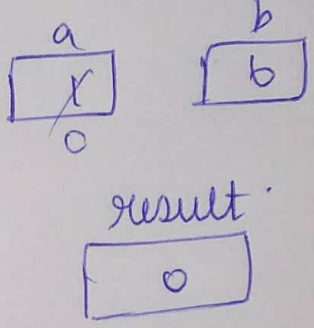
result = --a && ++b;

printf("%d", result); ⇒ 0

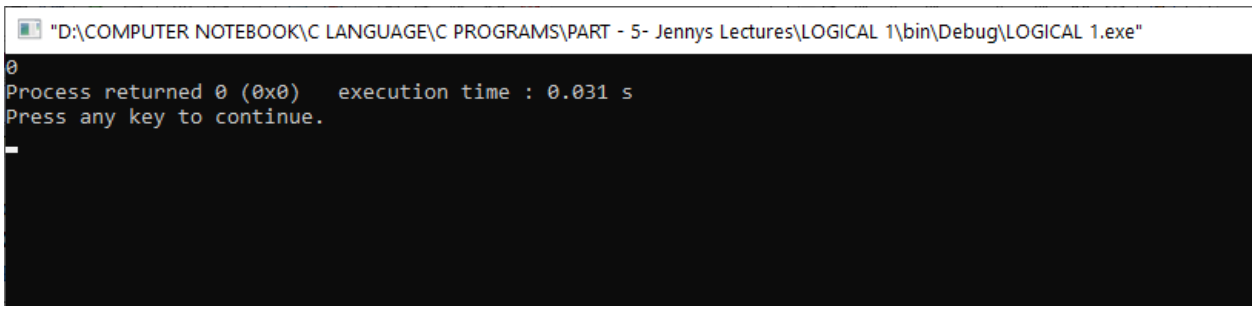
%d, a ⇒ 0

%d, b ⇒ b.

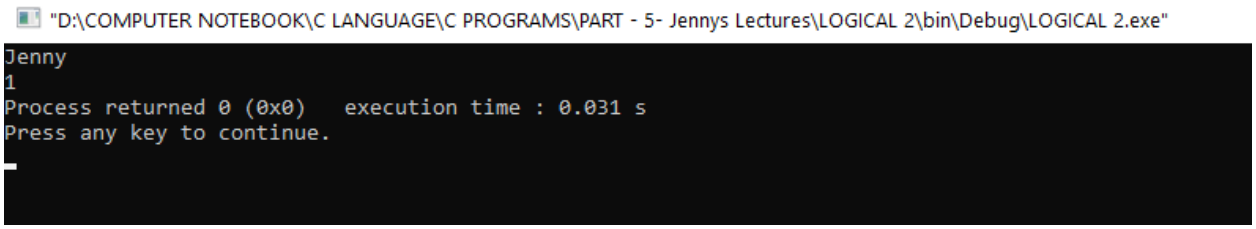
}



```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int a=4,b=6,result;
    result= a>b && printf("Jenny");
    printf("%d",result);
}
```




```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int a=4,b=6,result;
    result= a<b && printf("Jenny\n");
    printf("%d",result);
}
```



```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int a=4,b=6,result;
    result= a>b && printf("Jenny\n") || printf("Lectures\n") ;
    printf("%d",result);
}
```

"D:\COMPUTER NOTEBOOK\C LANGUAGE\C PROGRAMS\PART - 5- Jennys Lectures\LOGICAL 3\bin\Debug\LOGICAL 3.exe"

```
Lectures
1
Process returned 0 (0x0)   execution time : 0.016 s
Press any key to continue.
```

```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int a=4,b=6,result;
    result= a>b && printf("Jenny\n") || printf("Lectures\n") && printf("JK\n");
    printf("%d",result);
}
```

"D:\COMPUTER NOTEBOOK\C LANGUAGE\C PROGRAMS\PART - 5- Jennys Lectures\LOGICAL 4\bin\Debug\LOGICAL 4.exe"

```
Lectures
JK
1
Process returned 0 (0x0)   execution time : 0.055 s
Press any key to continue.
```

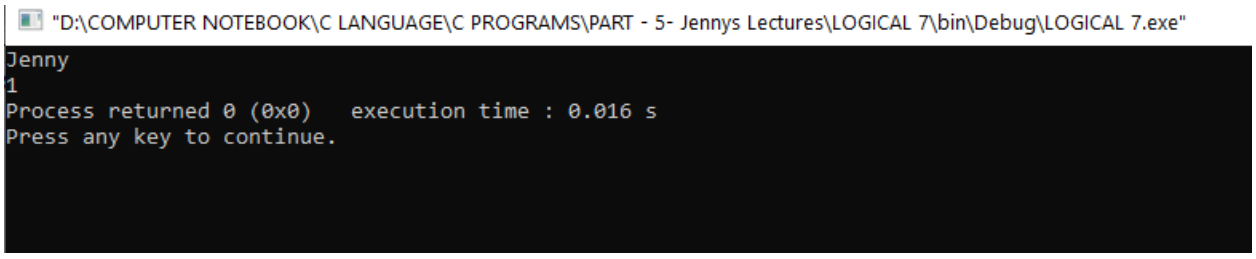
```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int a=4,b=6,result;
    result= a<b && printf("Jenny\n") || printf("Lectures\n") && printf("JK\n");
    printf("%d",result);
}
```

```
"D:\COMPUTER NOTEBOOK\C LANGUAGE\C PROGRAMS\PART - 5- Jennys Lectures\LOGICAL 5\bin\Debug\LOGICAL 5.exe"
Jenny
1
Process returned 0 (0x0)   execution time : 0.016 s
Press any key to continue.
```

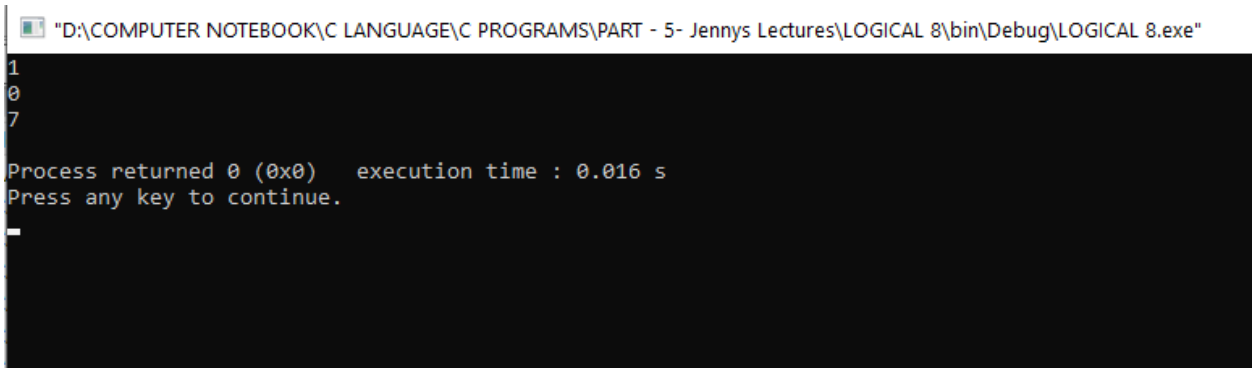
```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
        int a=4,b=6,result;
    result= a>b && printf("Jenny\n") || printf("Lectures\n") || printf("JK\n");
    printf("%d",result);
}
```

```
"D:\COMPUTER NOTEBOOK\C LANGUAGE\C PROGRAMS\PART - 5- Jennys Lectures\LOGICAL 6\bin\Debug\LOGICAL 6.exe"
Lectures
1
Process returned 0 (0x0)   execution time : 0.047 s
Press any key to continue.
```

```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
            int a=4,b=6,result;
    result= a<b && printf("Jenny\n") || printf("Lectures\n") || printf("JK\n");
    printf("%d",result);
}
```




```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
 int a=1,b=6,result;
 result = a-- && ++b;
 printf("%d\n",result);
 printf("%d\n",a);
 printf("%d\n",b);
}

```



```c
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int a=1,b=6,result;
 result = --a && ++b;
 printf("%d\n",result);
 printf("%d\n",a);
 printf("%d\n",b);
}
```