

# L3-Basics of Programming

Special class

# L3 - Basics of Programming

Operators, Conditionals & Loops

—> by Codehelp

# Operators:

Arithmetical → +, -, \*, /, %

++ , - =

Relational → ==, !=, >, <, >=, <=

assignment ( = )

logical operators ( &&, ||, ! )

If we Bitwise Operator

learn C++

Operators in C++

45 min

& | ^ ~ >> <<

l week

No. 1 / 7.1

/ hour 2

Arithmetic

Binary Op

2 operands

+  
-  
\*  
/  
%  
/

$$2 + 3 = 5$$

Unary Op

1 operand

++ --

M(Q)

Comment  
by links

$++$

increment op

int  $a = 5$

pre-increment

`cout << (++a);`

① Pehle increment karo

② Furhi increment karo

6

$++a$

$a$   $++$

post-increment

int  $a = 5;$

`cout << (a++);`

③ Pehle increment karo

④ Furhi increment karo

6 6

a

`cout << a;`

5

$\overline{\text{--}}$   $\rightarrow$  decrement

$\overline{\text{--}}$   $\rightarrow$  pre-decrement  $\rightarrow$   $(\text{--}a)$

$\overline{\text{--}}$   $\rightarrow$  post-decrement  $\rightarrow$   $(a \text{--})$

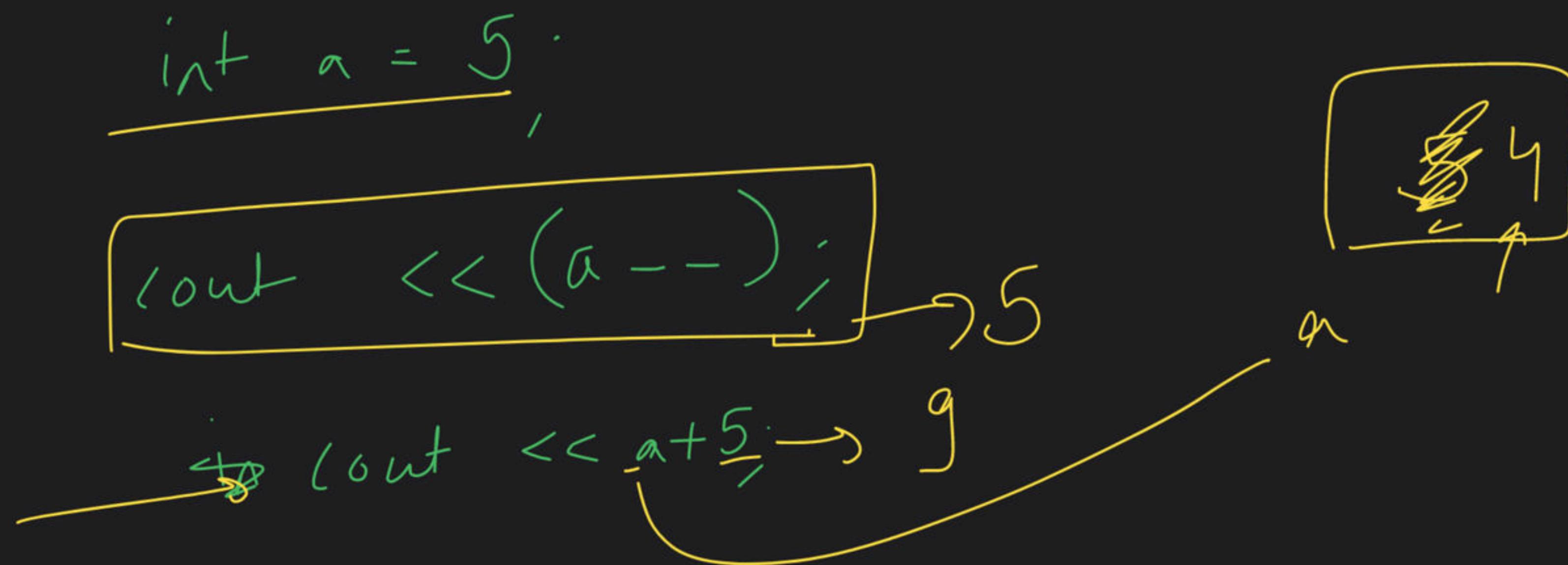
Pre-decrement  $\rightarrow$  ① Pchla decrement Kard  
② fir un Kard

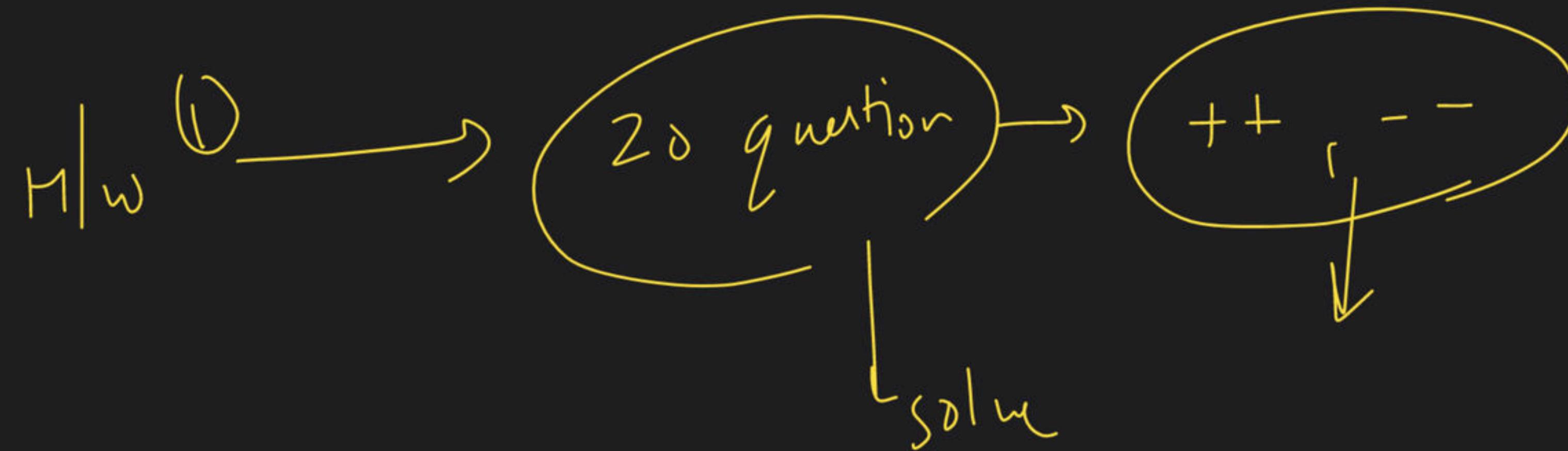
Int  $a = 5$   
 $\downarrow$   
 $(\text{out} << (\text{--}a)) \rightarrow Y$

$\rightarrow (\text{out} << a) \rightarrow Y$

Y 8  
8

Post - decrement  $\rightarrow$  ① Fchl, wo Karo  
② für decrement Karo

int a = 5;  
  
cout << (a--);   
  
→ cout << a+5 → 9



② Red Quiz → unlocked

Question :-

2 min

short-circuit  
condition

int a = 5;

cout << (++a); → 6  
cout << a; → 6  
cout << (a++); → 6  
cout << a; → 7  
cout << (--a); → 6  
(out << <; → 1  
cout << (a--); → 6  
cout << a; → 5

→ 5  
→ 6  
→ 7

H/W

any → looks hay  
a = 5

int val =

(++a) \* (a++) + (--a) \*  
(a--)

cout << val;

unary  
addition

a ++ +

a ++ b

(a++) + b

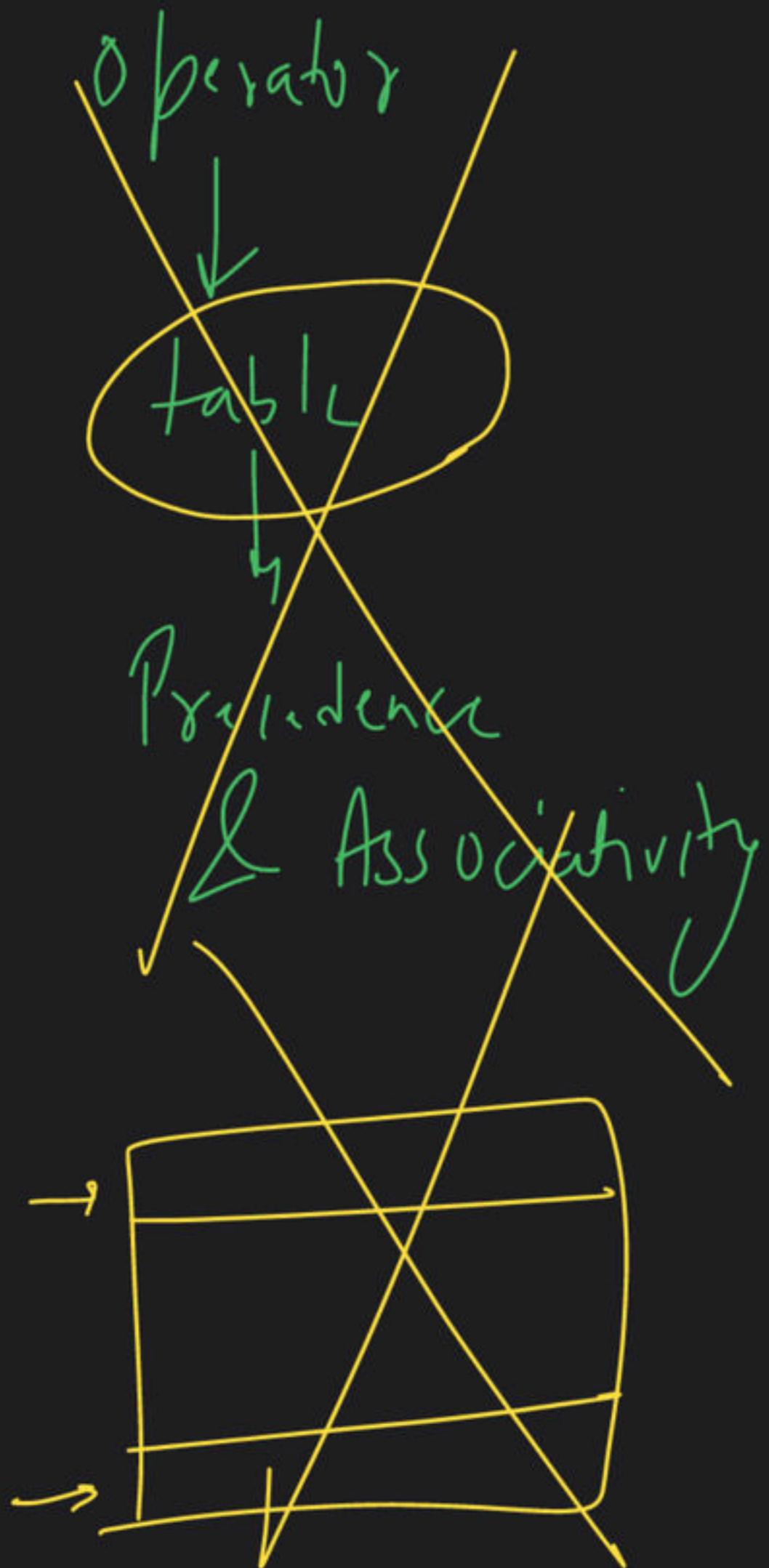
Val =  $(a++) \otimes (++a)$

$a++ \otimes ++a$

$$\left[ 2 + (3 \times 4) \right] + 5$$

exp?

Use Brackets



$$a = \begin{smallmatrix} 1 \\ 2 \end{smallmatrix}, b = \begin{smallmatrix} 1 \\ 2 \end{smallmatrix}$$
$$\left( \begin{smallmatrix} - & - & a \end{smallmatrix} \right) \star \left( \begin{smallmatrix} + & + & b \end{smallmatrix} \right) \star \begin{smallmatrix} 5 \\ 7 \end{smallmatrix}$$

$$4 \times 8 \times 5$$

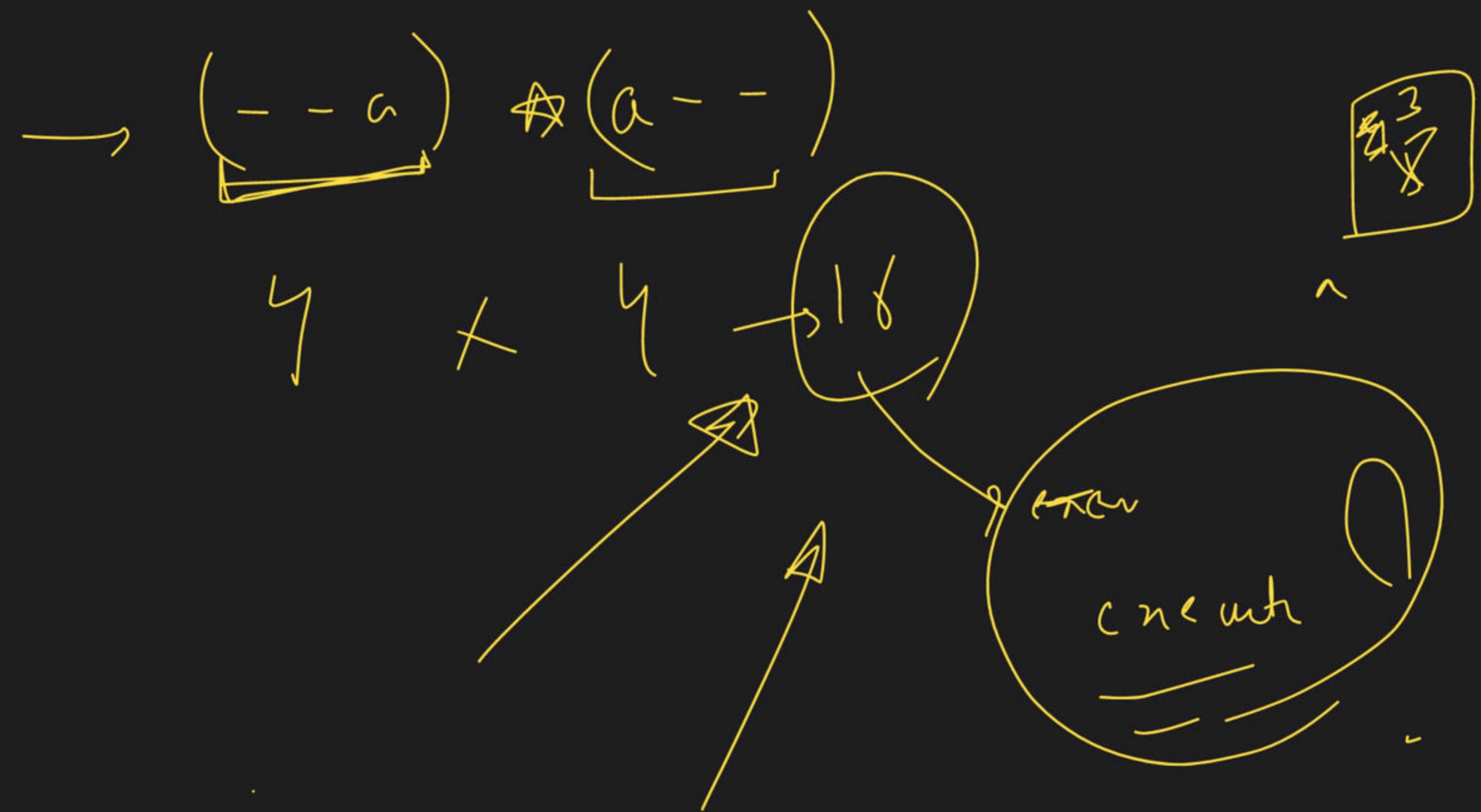
$$4 \times 4_0$$

160

$$\left( \begin{smallmatrix} - & - & a \end{smallmatrix} \right) \star \left( \begin{smallmatrix} b & + & + \end{smallmatrix} \right)$$
$$4 \times 6$$

24

$n=5$

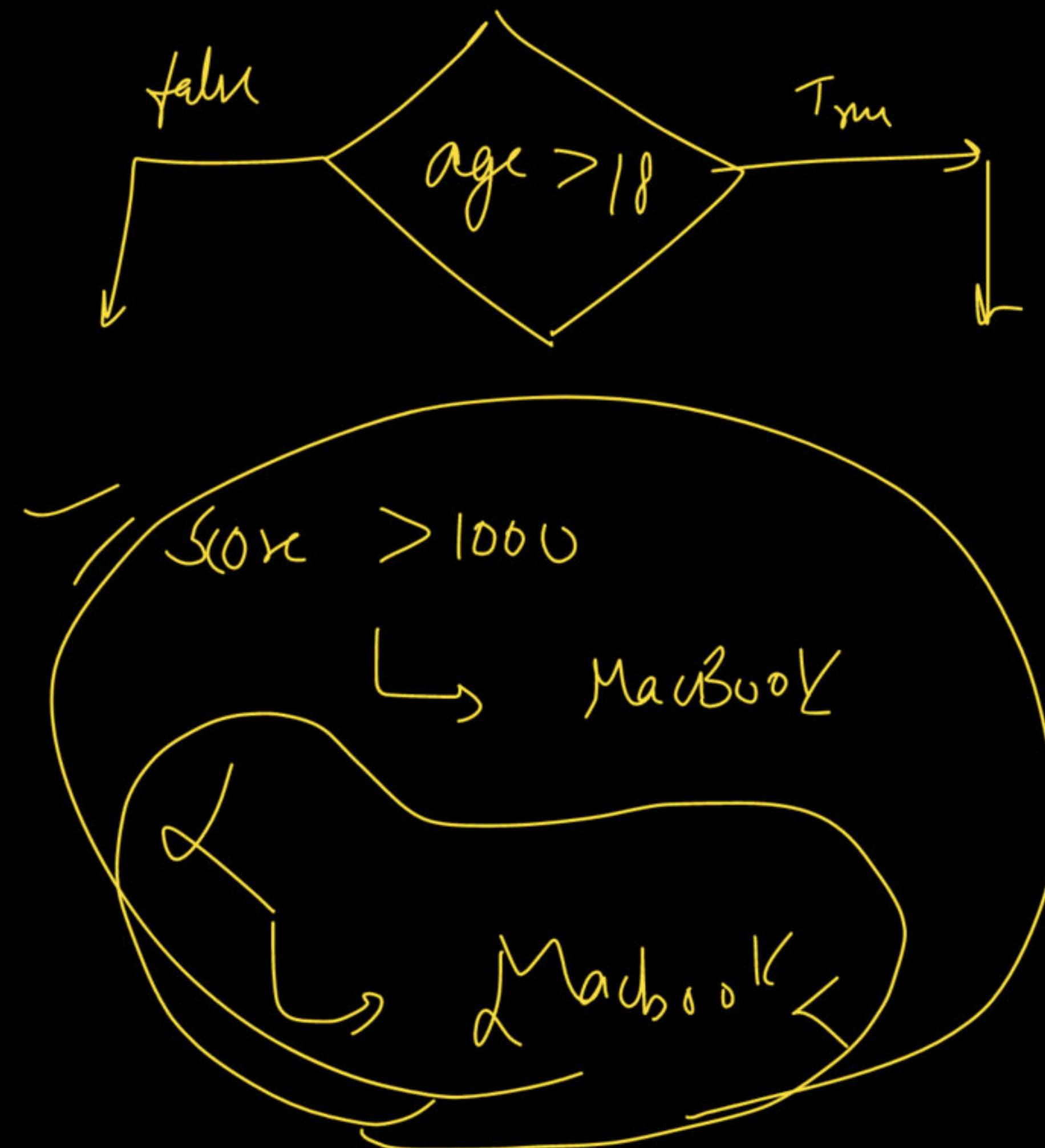


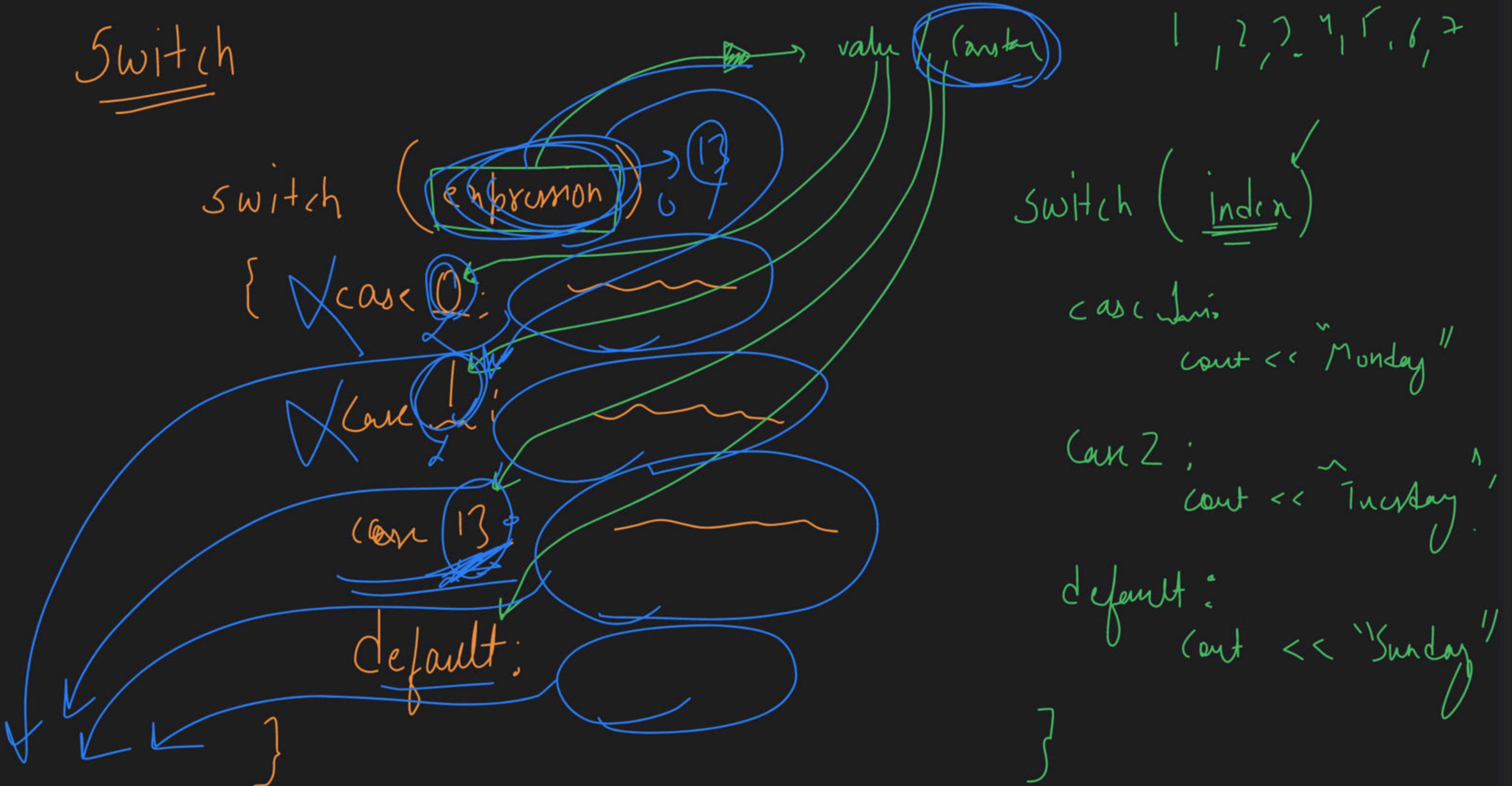
g 9 9 9 9 - - - - g

13

# Conditionals:

- Basic if block
- If-else block
- If-elseif-else block
- Nested if else
- Switch case
- Ternary Operator





switch (index)

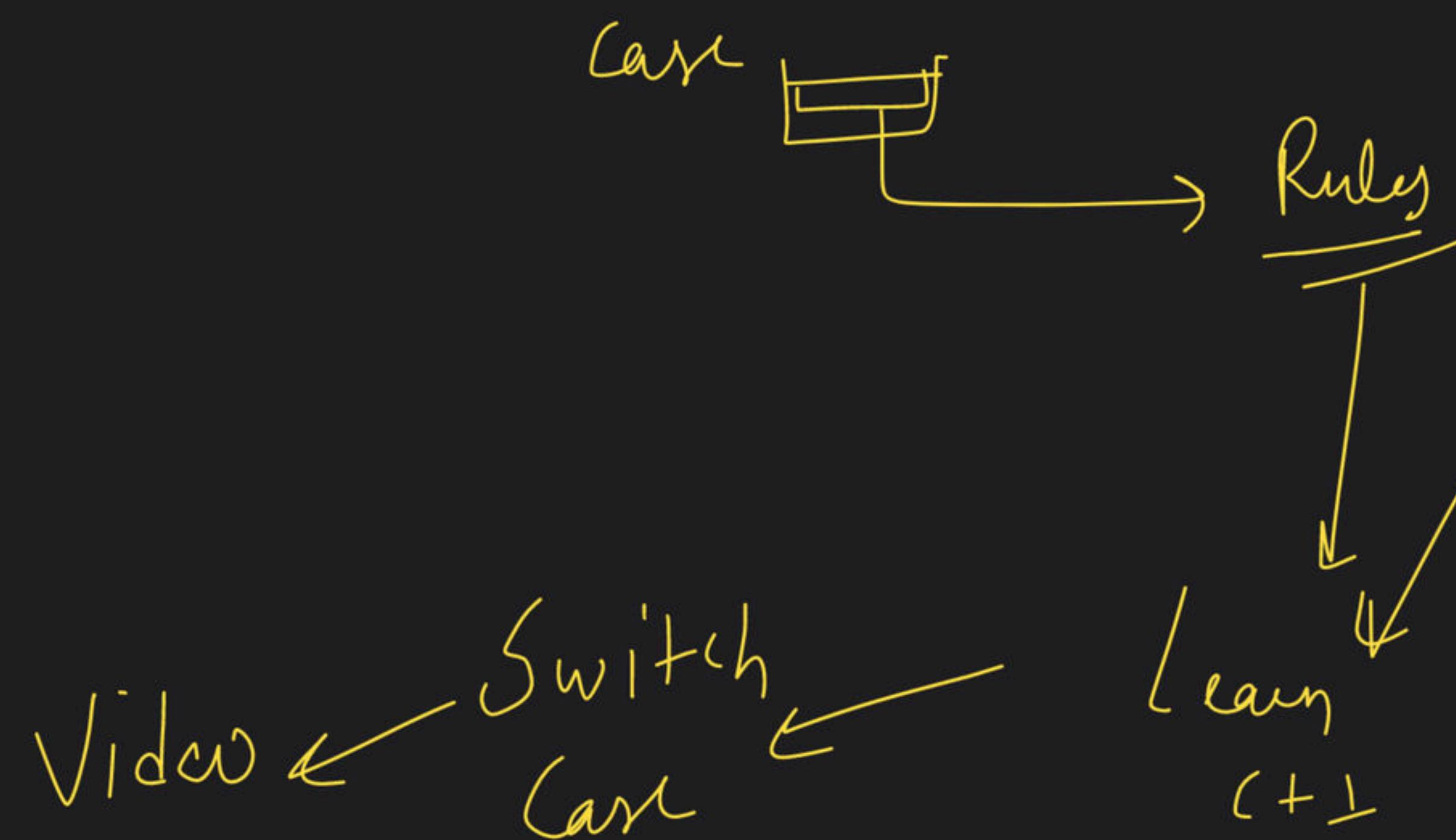
{

case 0 : { int a=15;

}

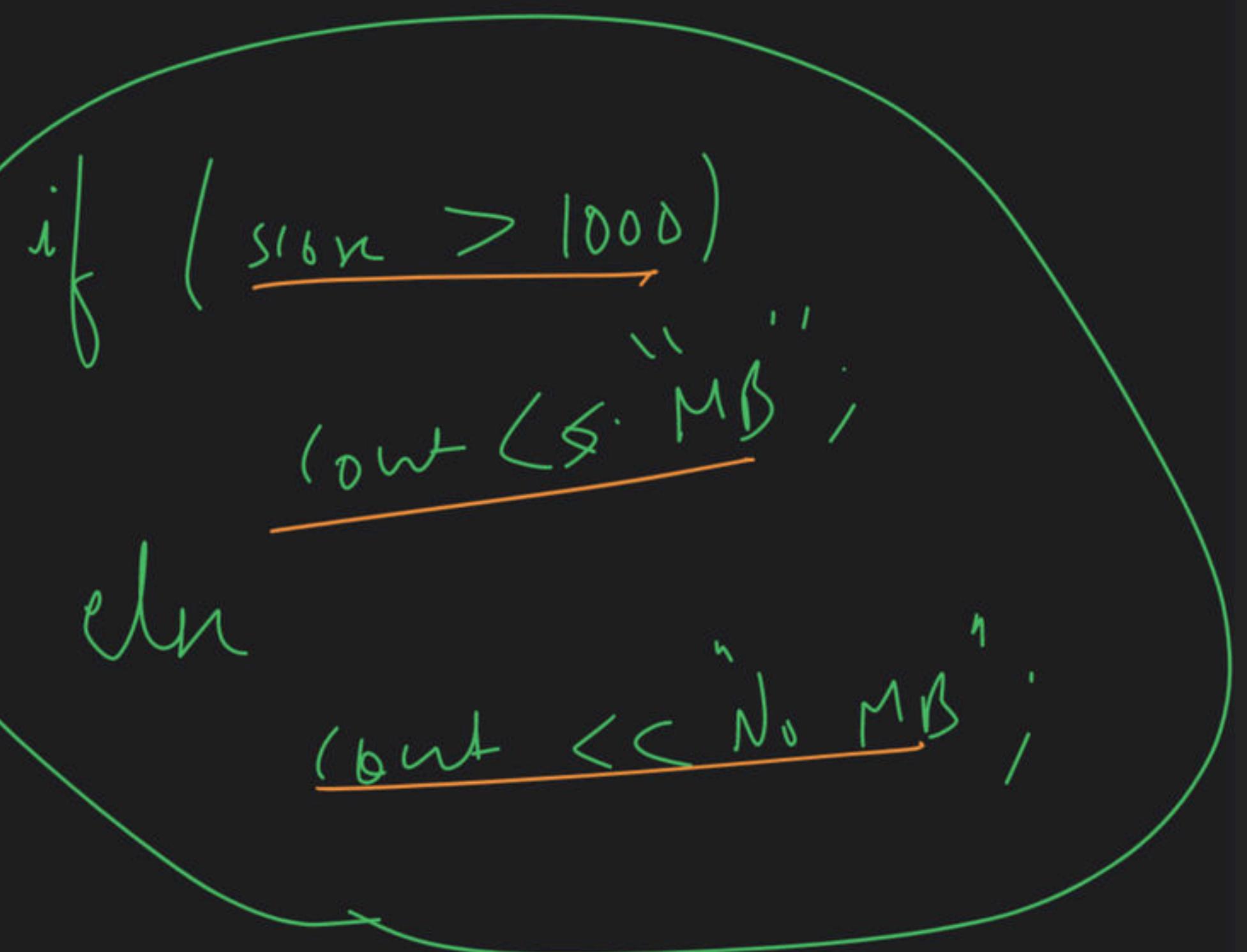
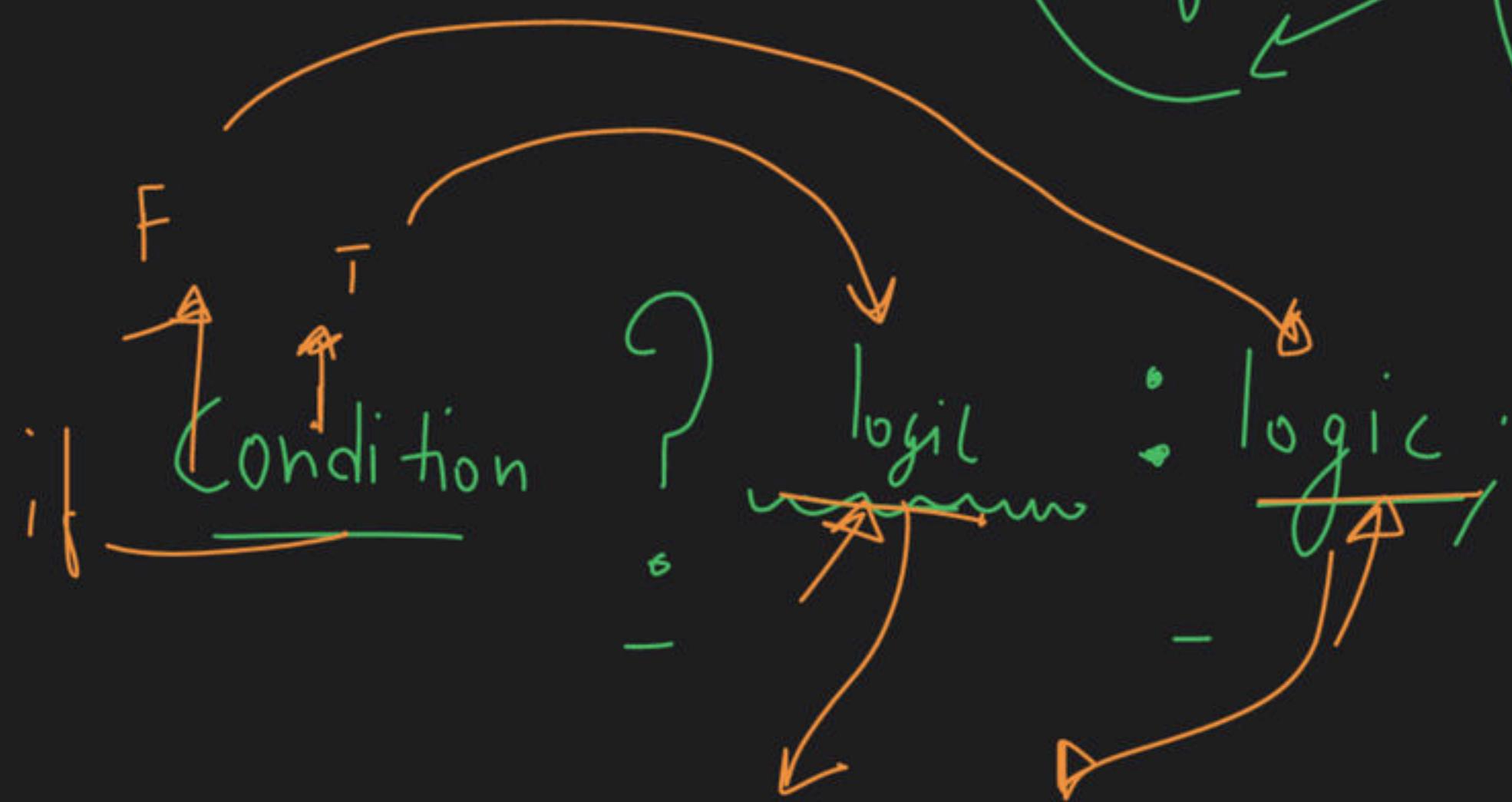
}

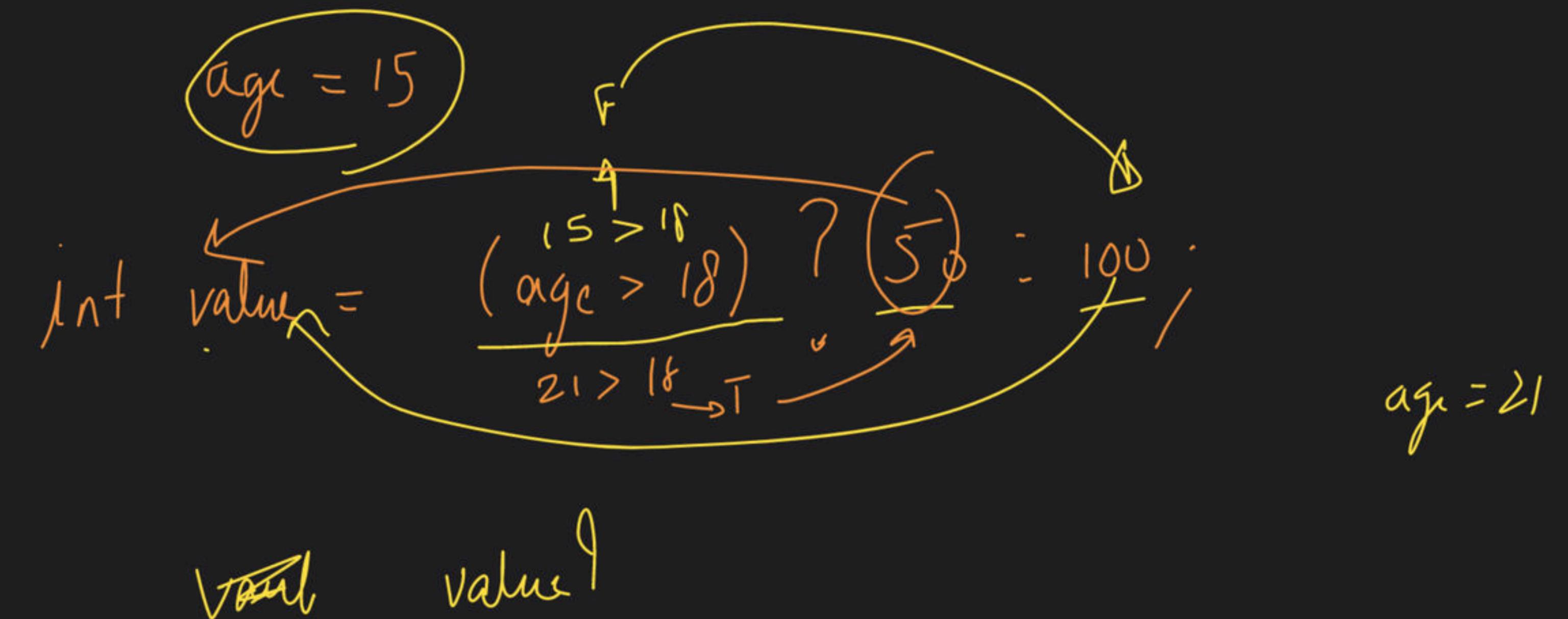
Switch (expression)  $\rightarrow$  Kya Kya  $\rightarrow$  Rules

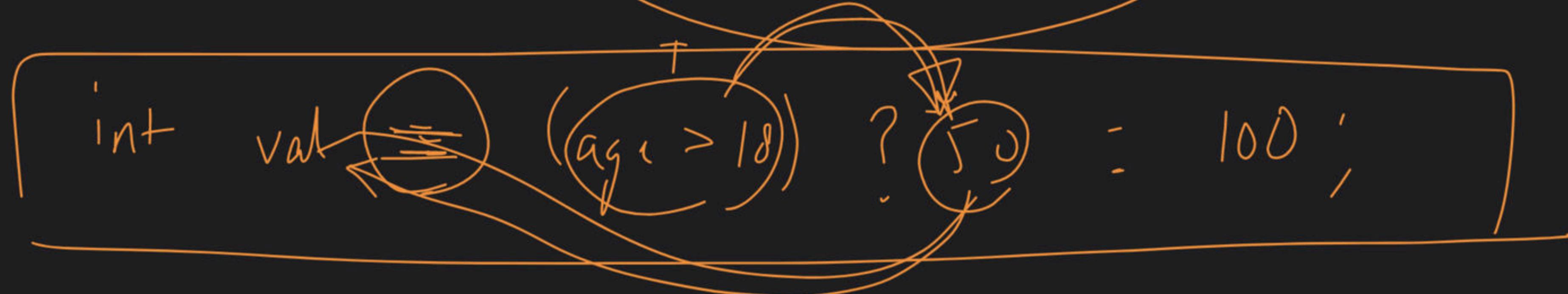
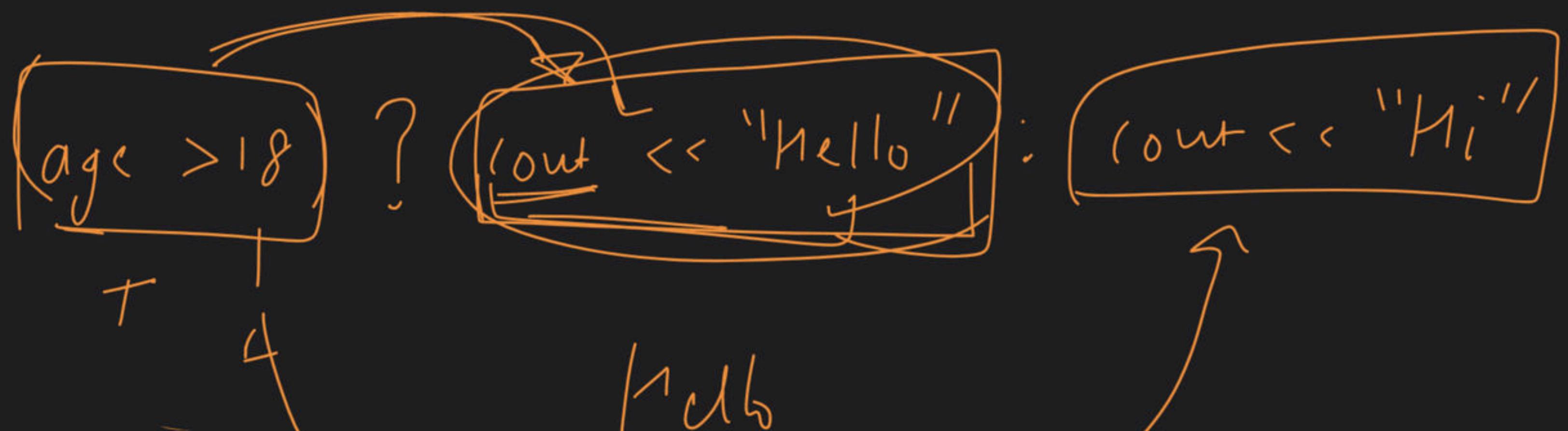


Ternary Operator

Syntax







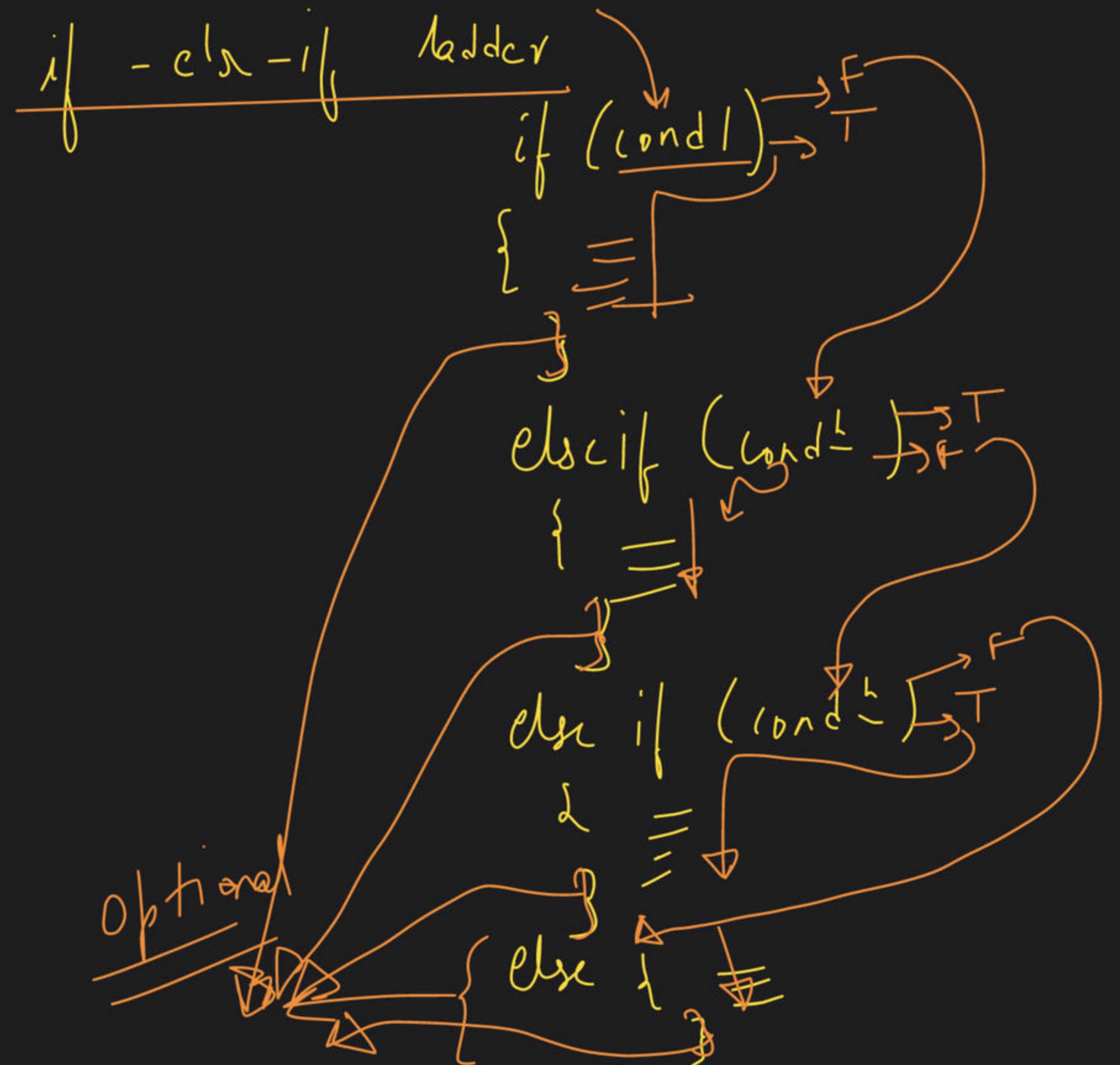
`cout << val;` → 50

Val



```
if ( )  
{  
    if ( )  
    {  
        if ( )  
    }  
}
```

```
if ( )  
{  
    if ( )  
    {  
        if ( )  
    }  
}  
dn  
{  
    if ( )  
    dn  
}
```



short - circuiting

if

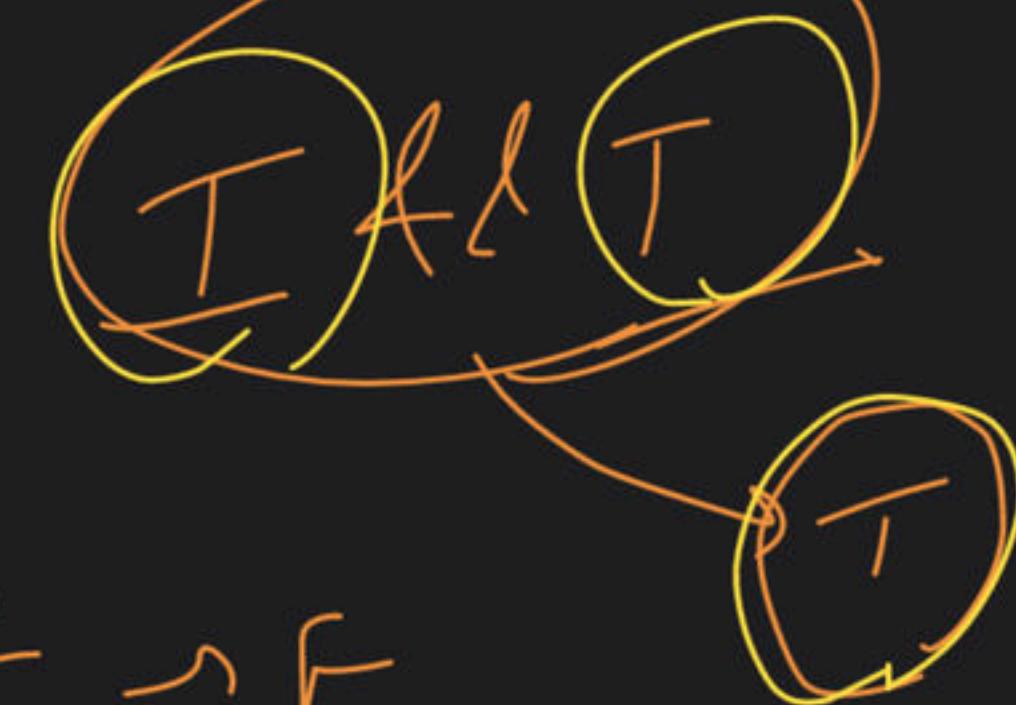
{

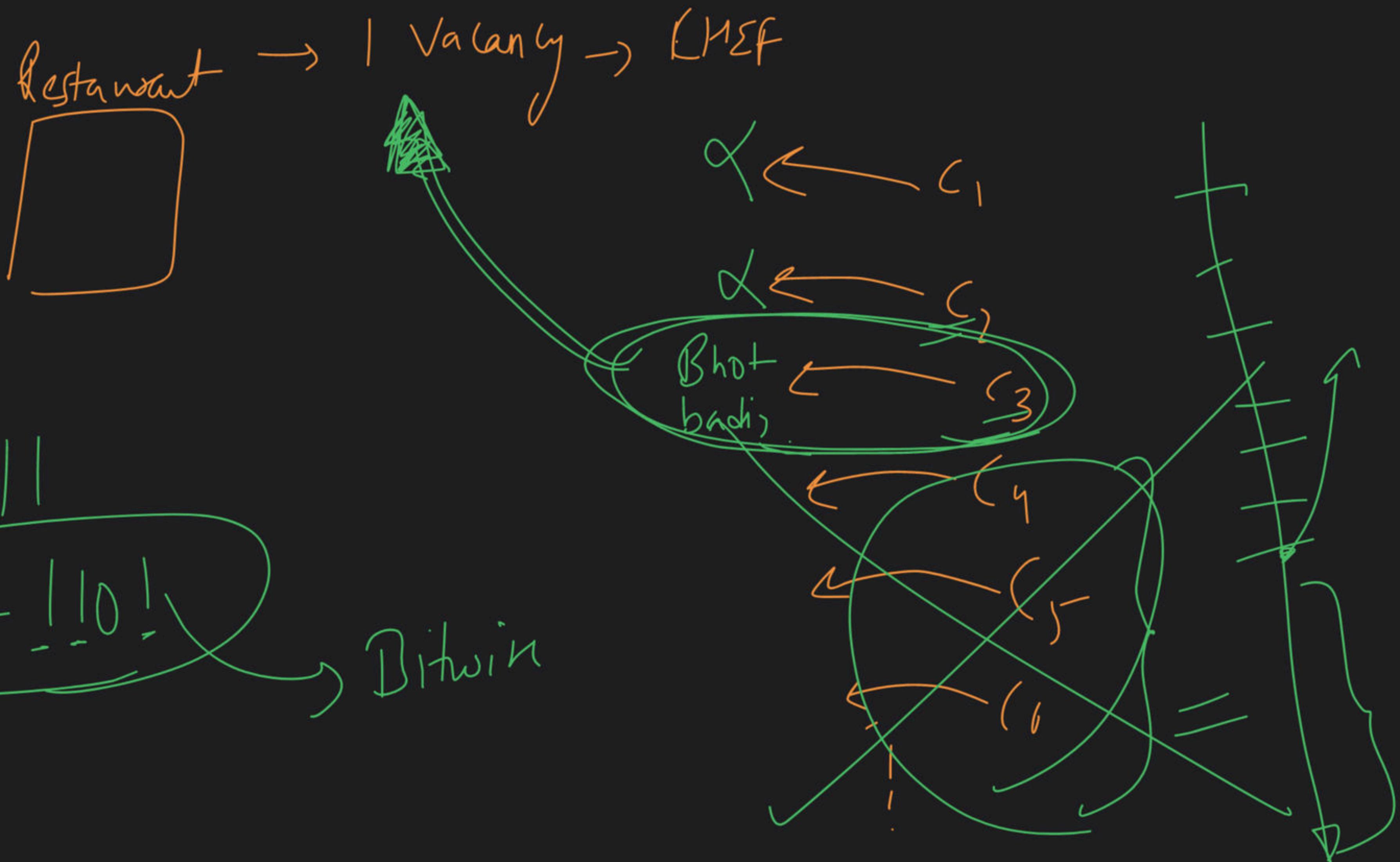
}

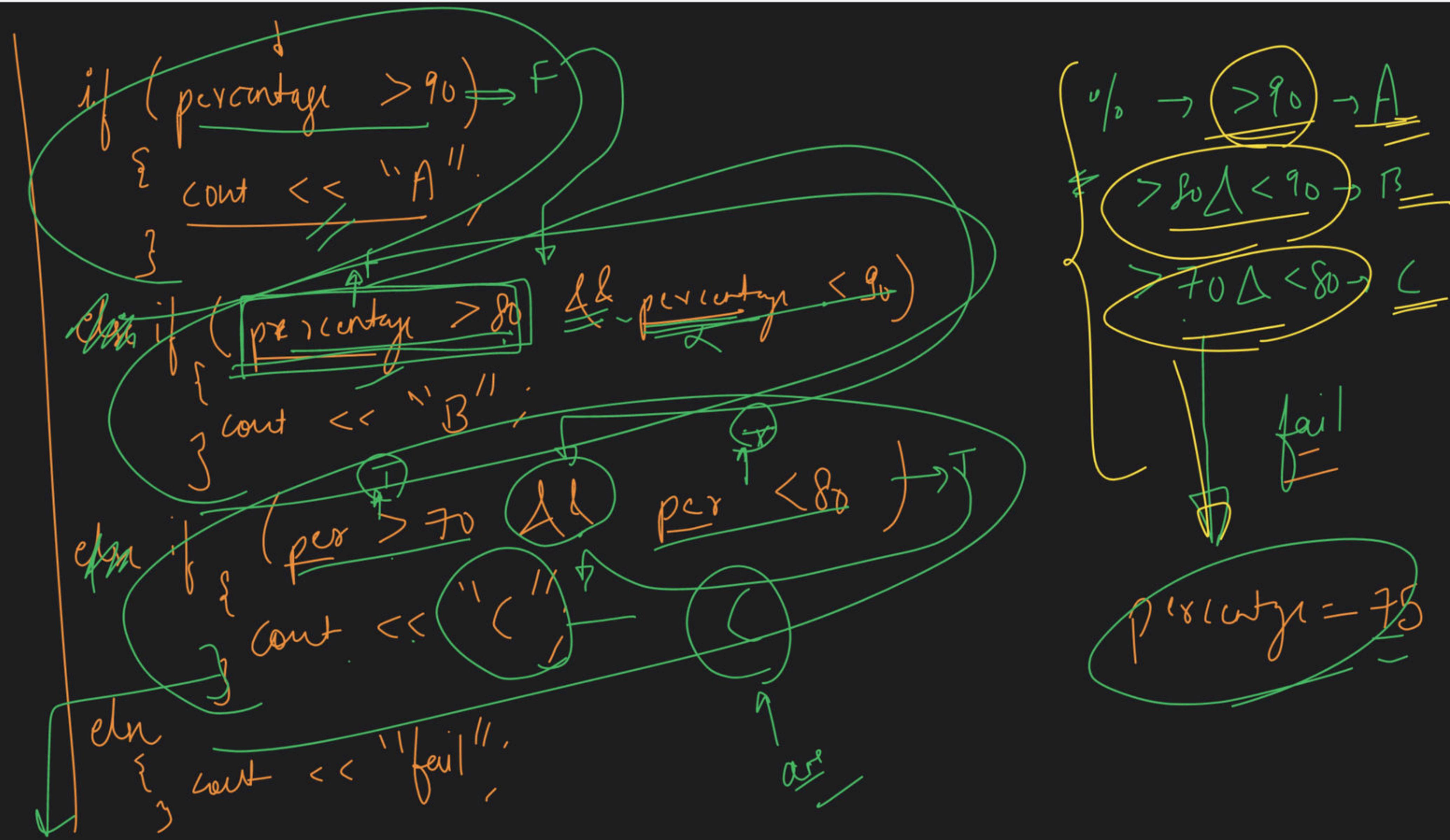
cout << "Love"

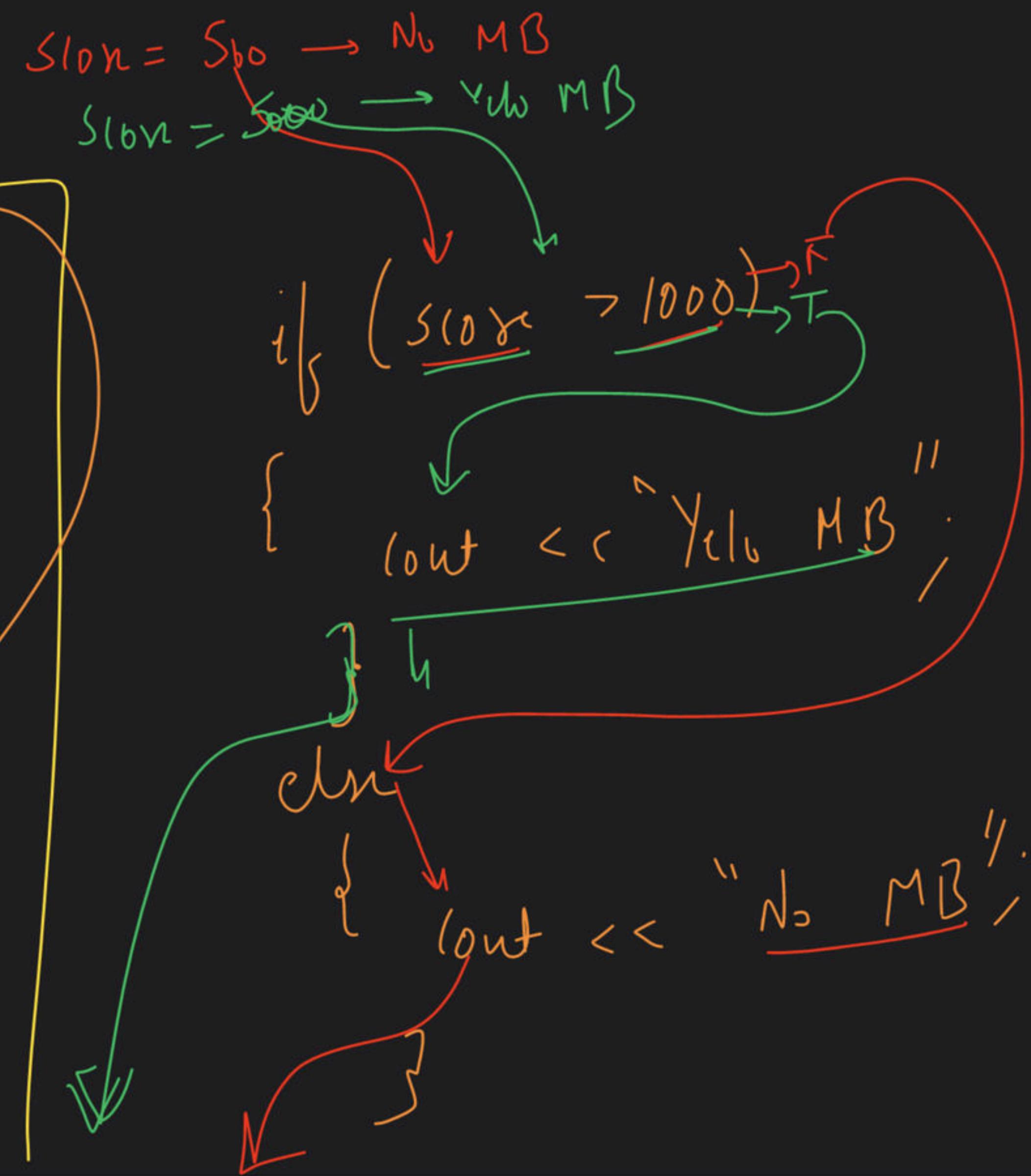
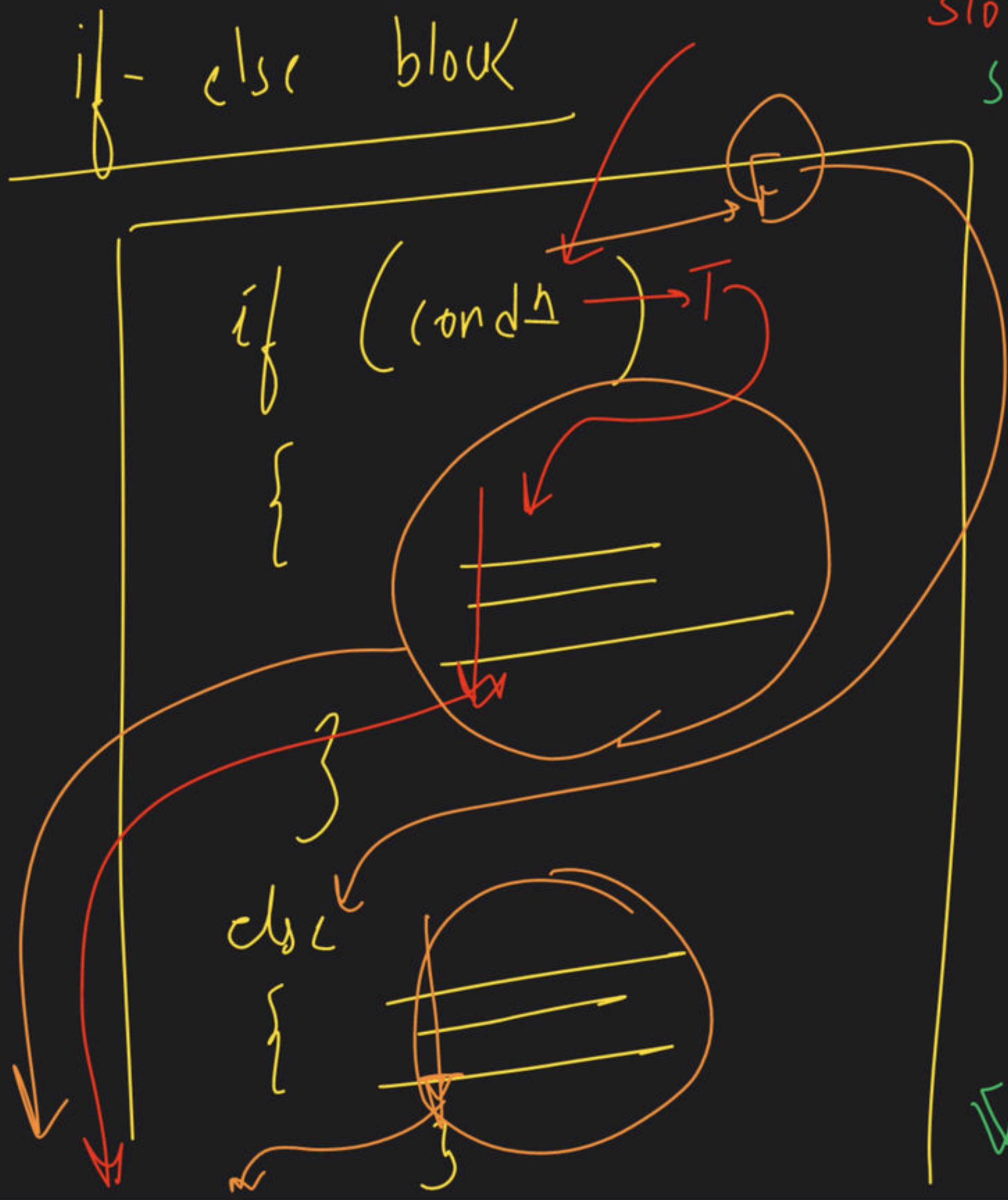
F&T>F

F&F>F T&F>F









```
if (age >= 15)
{
    cout << "You look "
}
```

```
if (slope > 1000)
{
    cout << "Yellow MacBook"
}
```

```
if ( age >= 18 & & scon > 1000 )  
{ cout << "Bike";  
}
```

$A$

Bitwise  
AND op

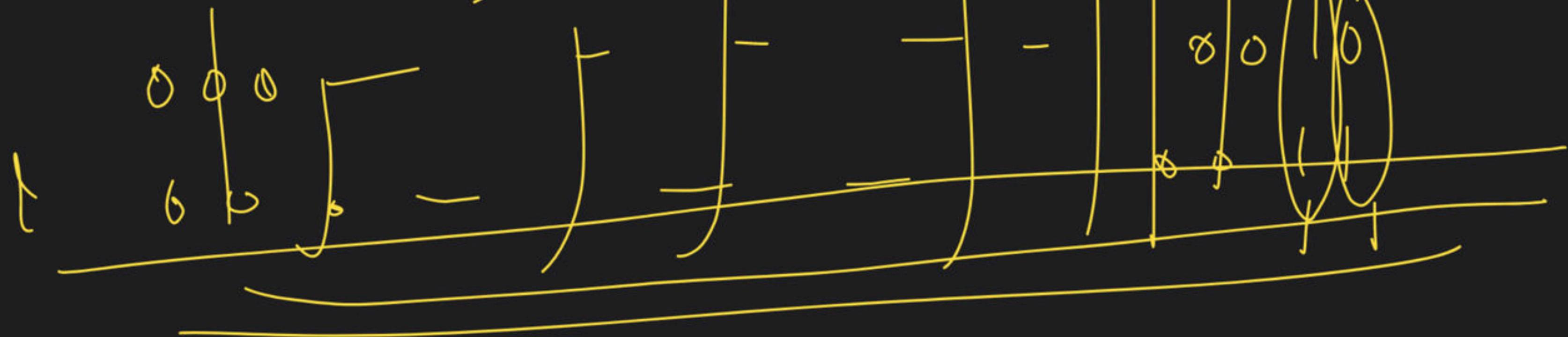
$B$

logical  
AND oper

$2 \oplus 3$

$T \oplus \bar{T}$

$2 \oplus 3$





Basic - if Block

Syntax →

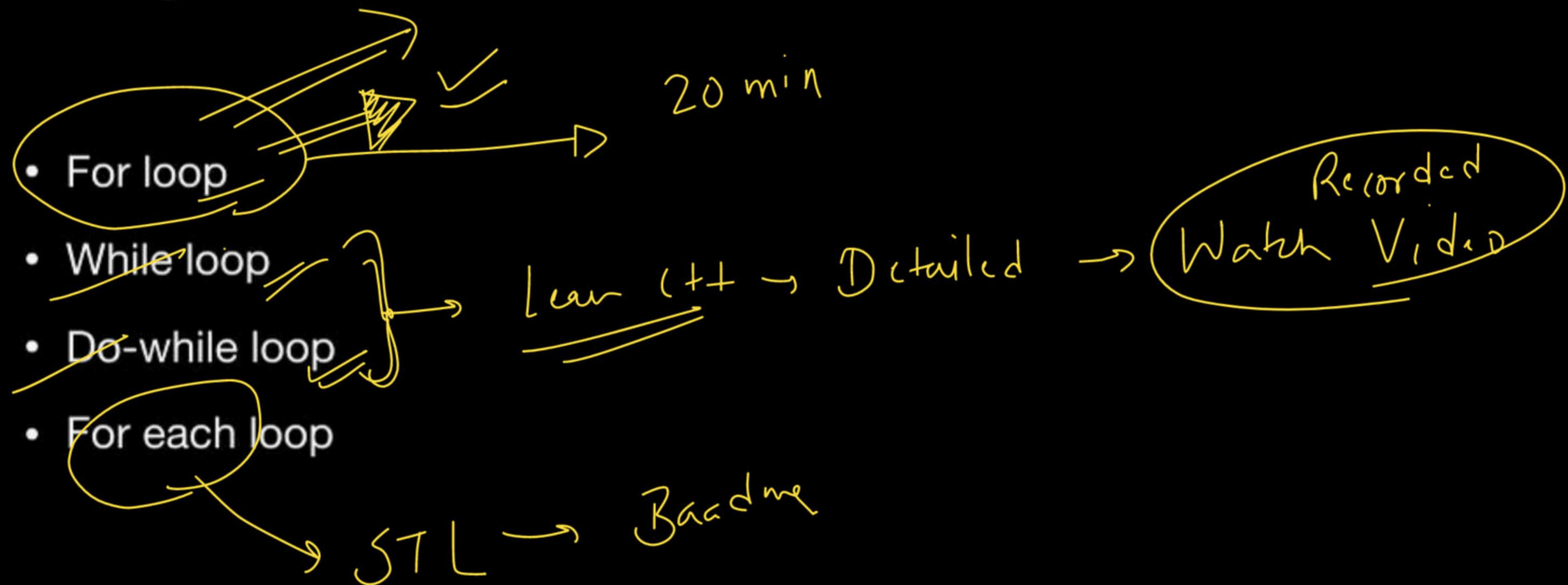
if (Condition)  
multiple / join -> operation

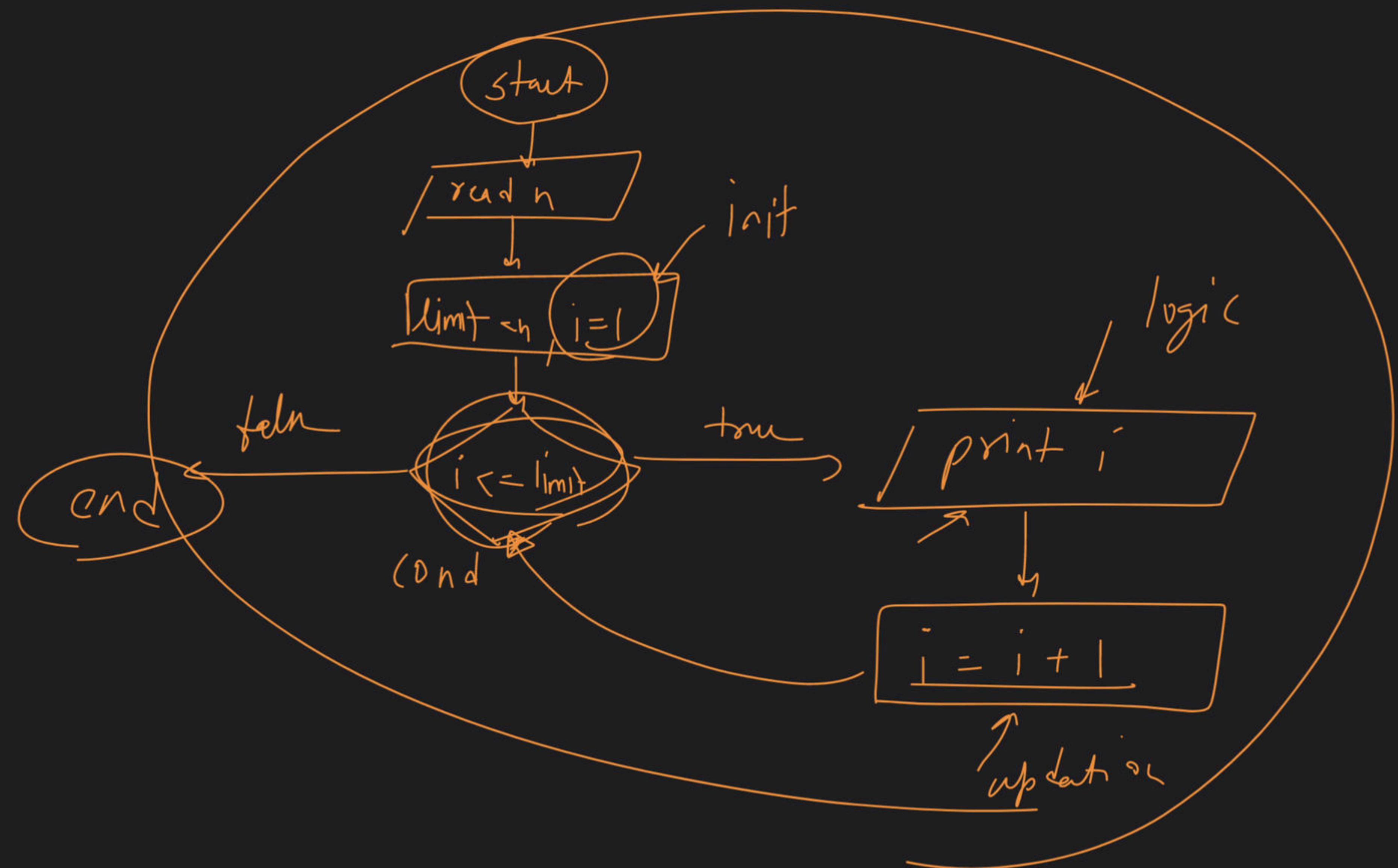


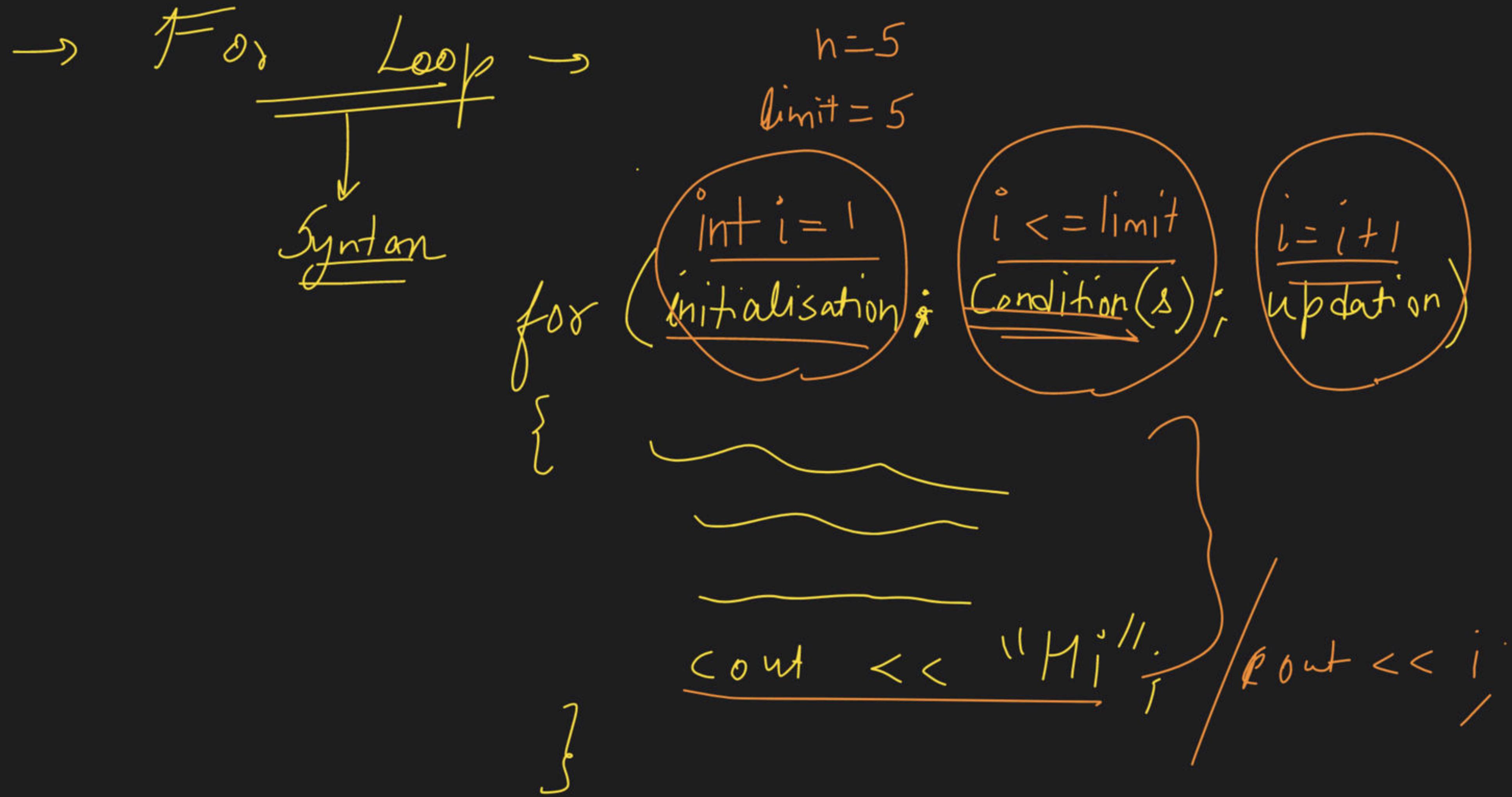
Variable Scoping

~~functions~~

# Loops:







$\text{for } (\text{int } i=1; i \leq 5; i = i+1)$   
 {
 }

$\text{cout} \ll i;$

$i = i+1$   
 or  
 $++i$  ✓  
 or  
 $i++$  ✗

$$i = 1$$

$$1 \leq 5$$

T

Print 1

$$i = 1+1 = 2$$

$$2 \leq 5$$

T

Print 2

$$i = 2+1 = 3$$

$$3 \leq 5$$

T

Print 3

$$i = 3+1 = 4$$

$$4 \leq 5$$

T

Print 4

$$i = 4+1 = 5$$

$$5 \leq 5$$

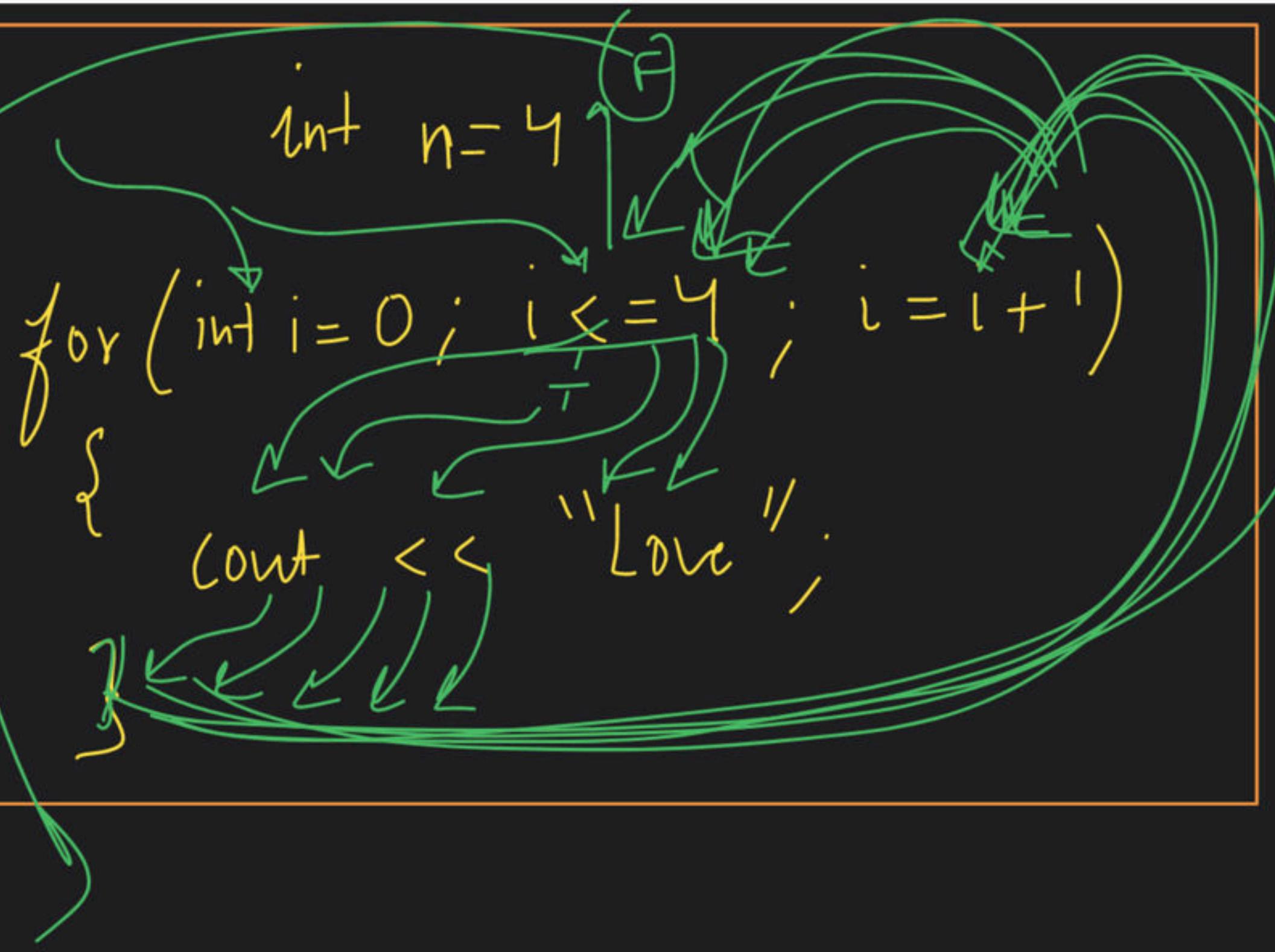
T

Print 5

$$i = 5+1 = 6$$

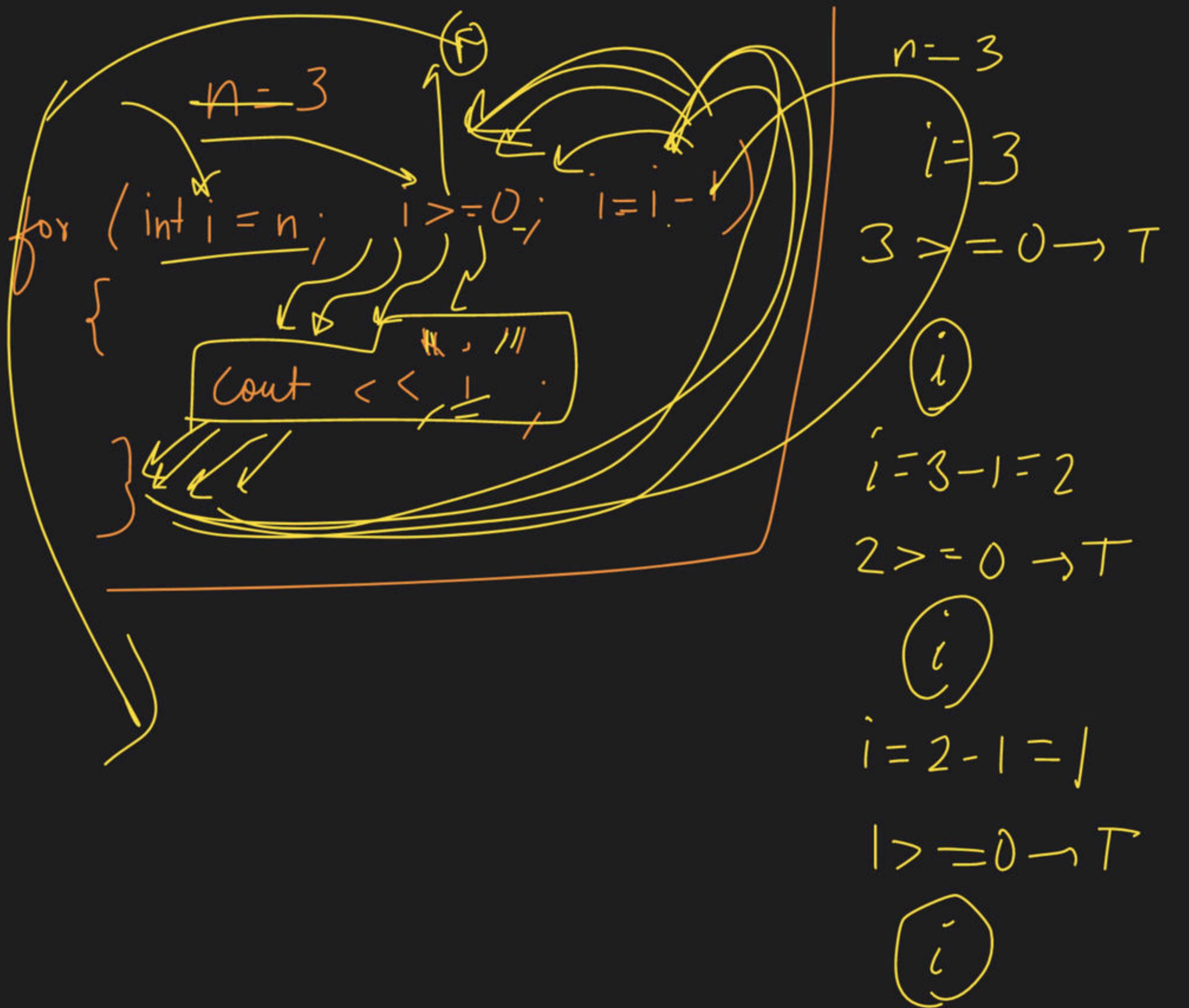
$$6 \leq 5$$

T

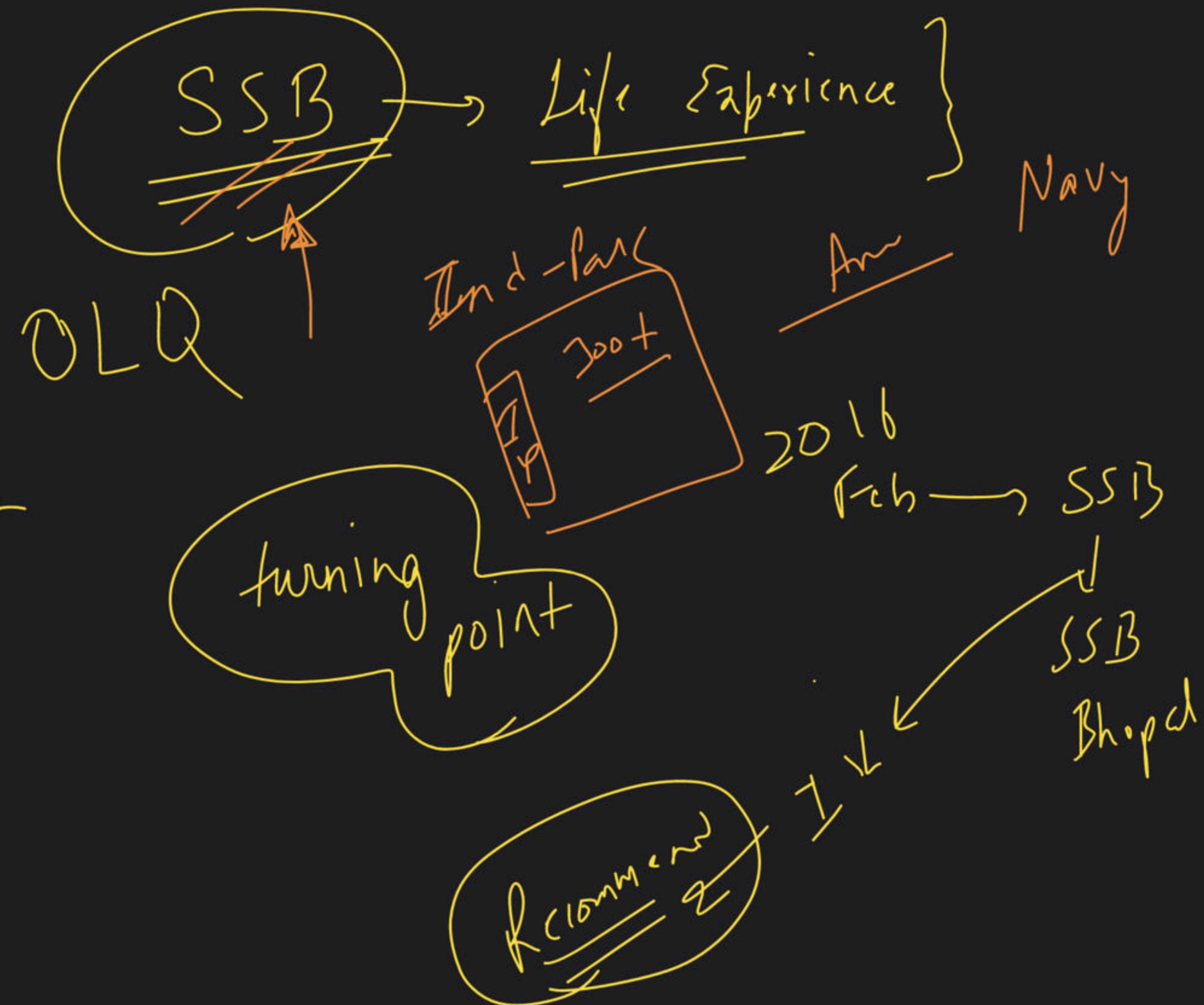
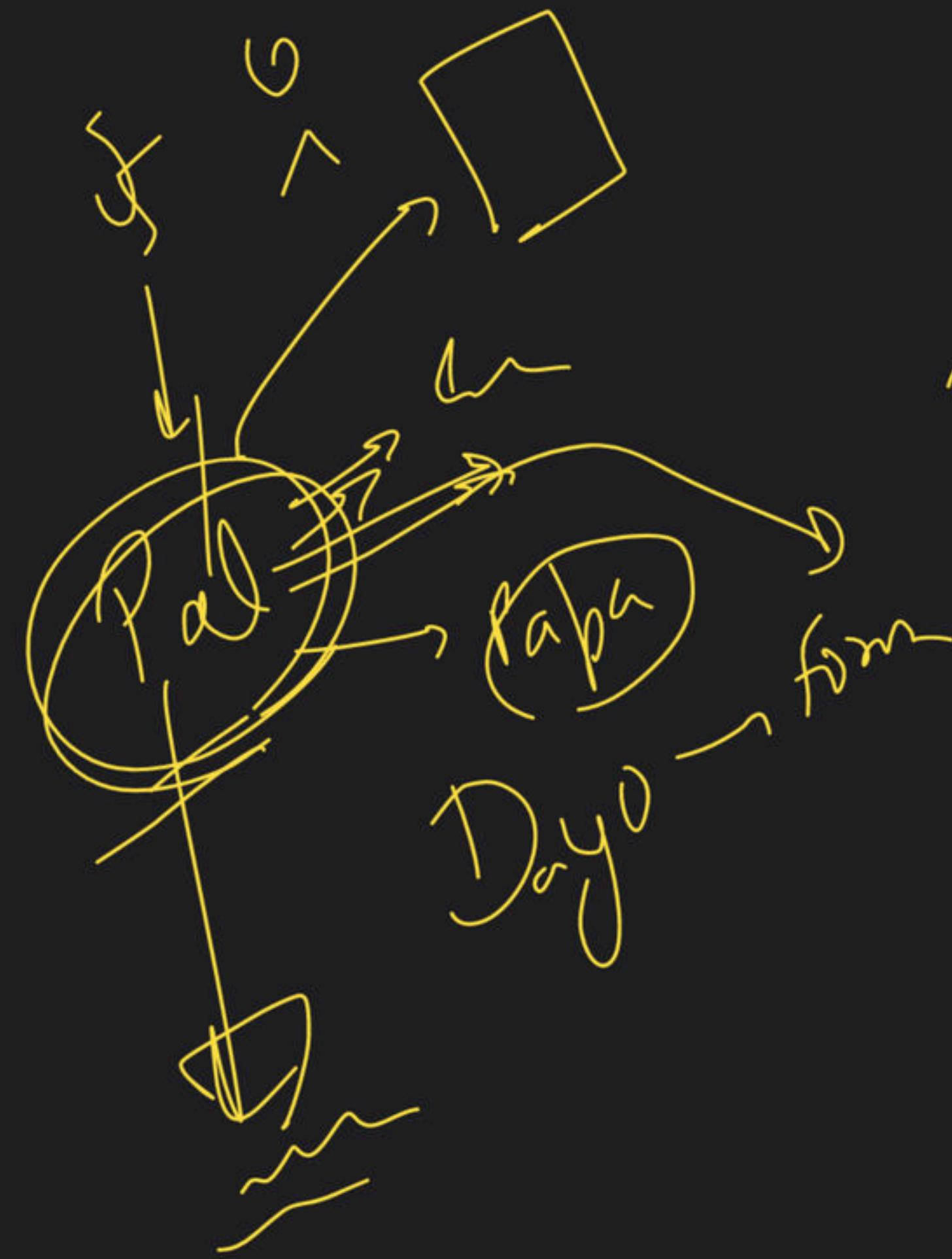


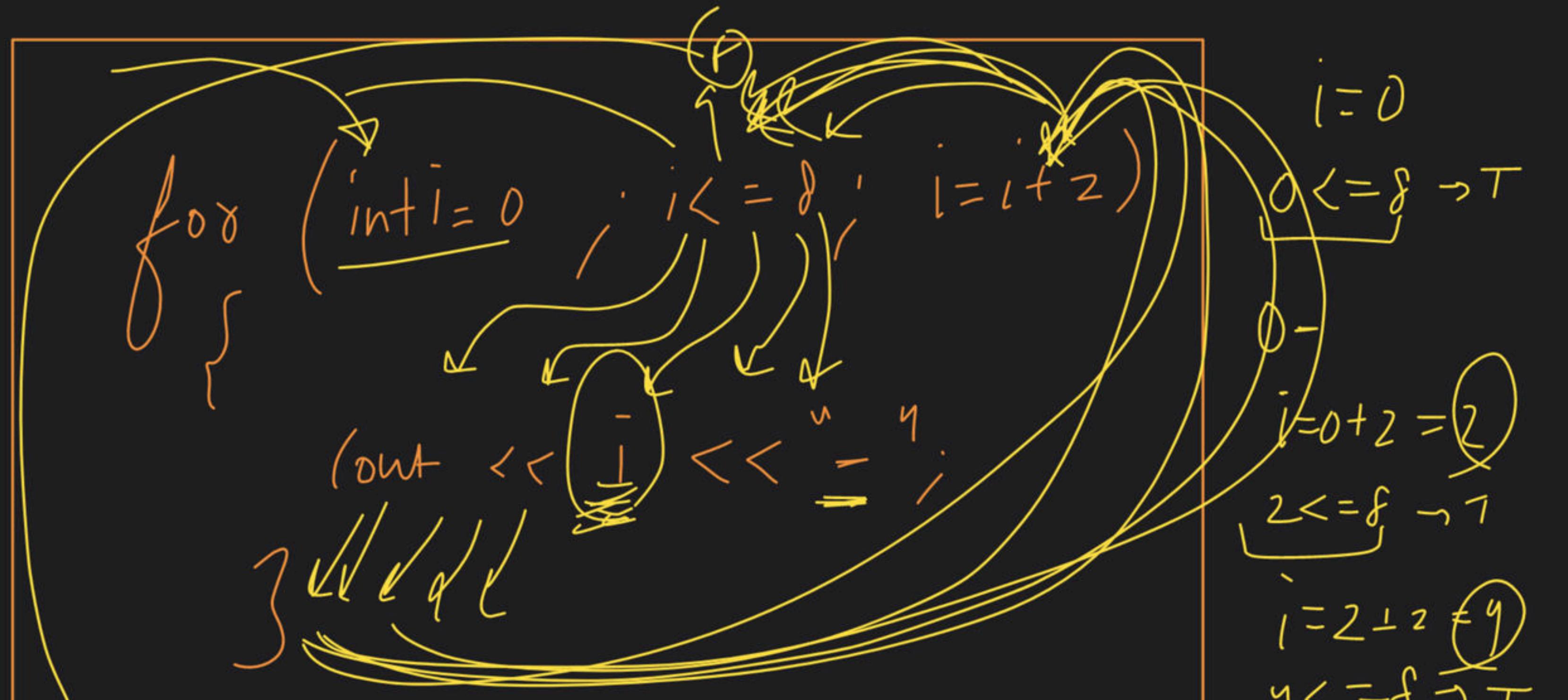
$n = 4$   
 $i = 0$   
 $0 \leq 4 \rightarrow T$   
 Love  
 $i = 0 + 1 = 1$   
 $1 \leq 4 \rightarrow T$   
 Love  
 $i = 1 + 1 = 2$   
 $2 \leq 4 \rightarrow T$   
 Love

$i = 2 + 1 = 3$   
 $3 \leq 4 \rightarrow T$   
 Love  
 $i = 3 + 1 = 4$   
 $4 \leq 4 \rightarrow T$   
 Love  
 $i = 4 + 1 = 5$   
 $5 \leq 4 \rightarrow F$

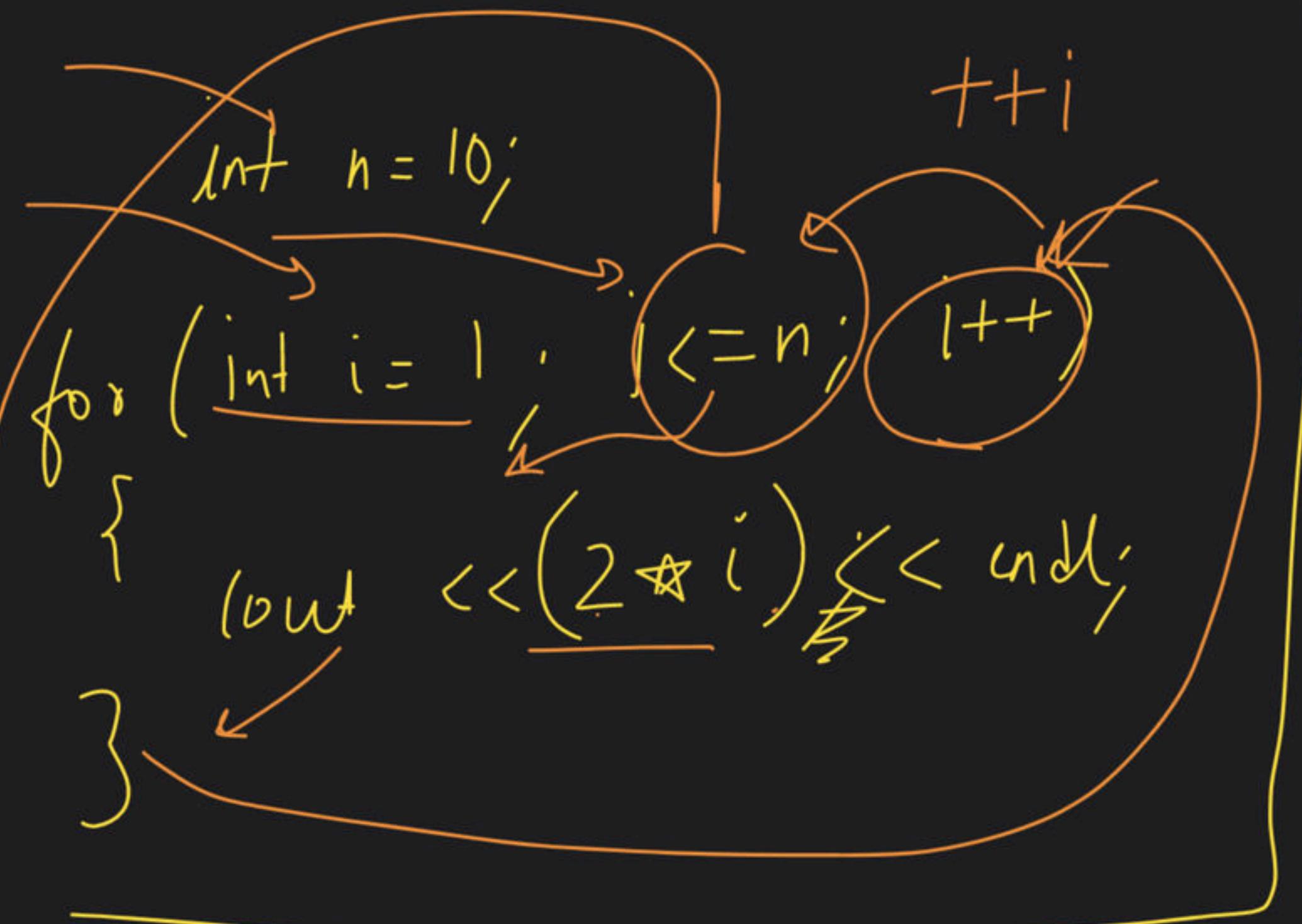


$i : 1 - 1 = 0$   
 $0 >= 0 \rightarrow +$   
 $i$   
 $i = 0 - 1 = -1$   
 $-1 >= 0 \rightarrow F$





$0 / \rho \rightarrow 0 - 2 - 4 - 6 - 8 -$



Handwritten annotations for the loop iteration:

- $n = 10$
- $i = 1$
- $1 \leq 10 \rightarrow T$
- $i = 2$
- $2 \leq 10 \rightarrow T$
- $i = 3$
- $i = 4$
- $i < 10$
- $i = 6$
- $i = 7$
- $i = 8$
- $i = 9$
- $i = 10 \rightarrow F$
- $i = 11$
- $\Rightarrow 11 \leq 10 \rightarrow F$

Annotations for the output values:

- $0/p \rightarrow 2$
- $12$
- $14$
- $16$
- $18$
- $20$

# Pathway

