

# CS & IT ENGINEERING



Programming in C  
Chapter-2  
**Control Flow Statements**  
Lec- 01



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## TOPICS TO BE COVERED



**Decision Control Statements-I**

## Identifiers

- ① a-zA-Z, 0-9, - (underscore)
- ② Can not start with a digit

1abc X

2\_a X

- ③ Space not allowed

int \_ = 10; ✓  
int -la = 20; ✓

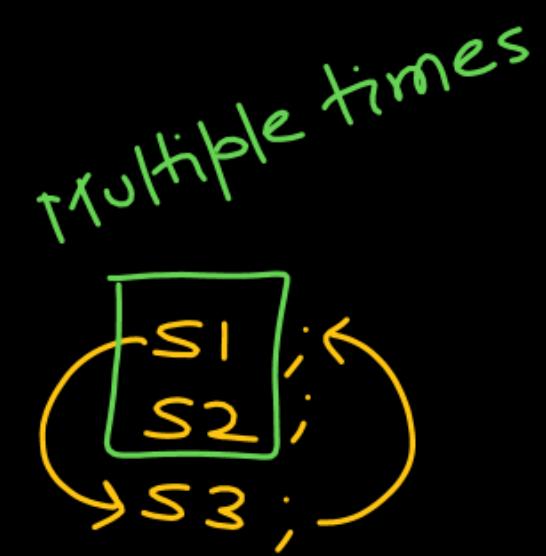
Operators ✓

# Control Flow statements

---

```
#include<stdio.h>  
  
void main(){  
    s1;  
    s2;  
    s3;  
    s4;  
    s5;  
}
```

by default  
Sequential order



## Control Flow Statement

- ① Selection statements : if  
if - else  
if - else if - else | switch statement
- ② Iterative statement (Repeat) : for loop, while loop, do-while loop
- ③ Jump statement : continue, break, return, ~~goto~~.

## Selection statement

```
#include<stdio.h>
void main(){
    s1;
    s2;
    s3;
    s4;
    s5;
    s6;
    s7;
    s8;
}
```

### if statement

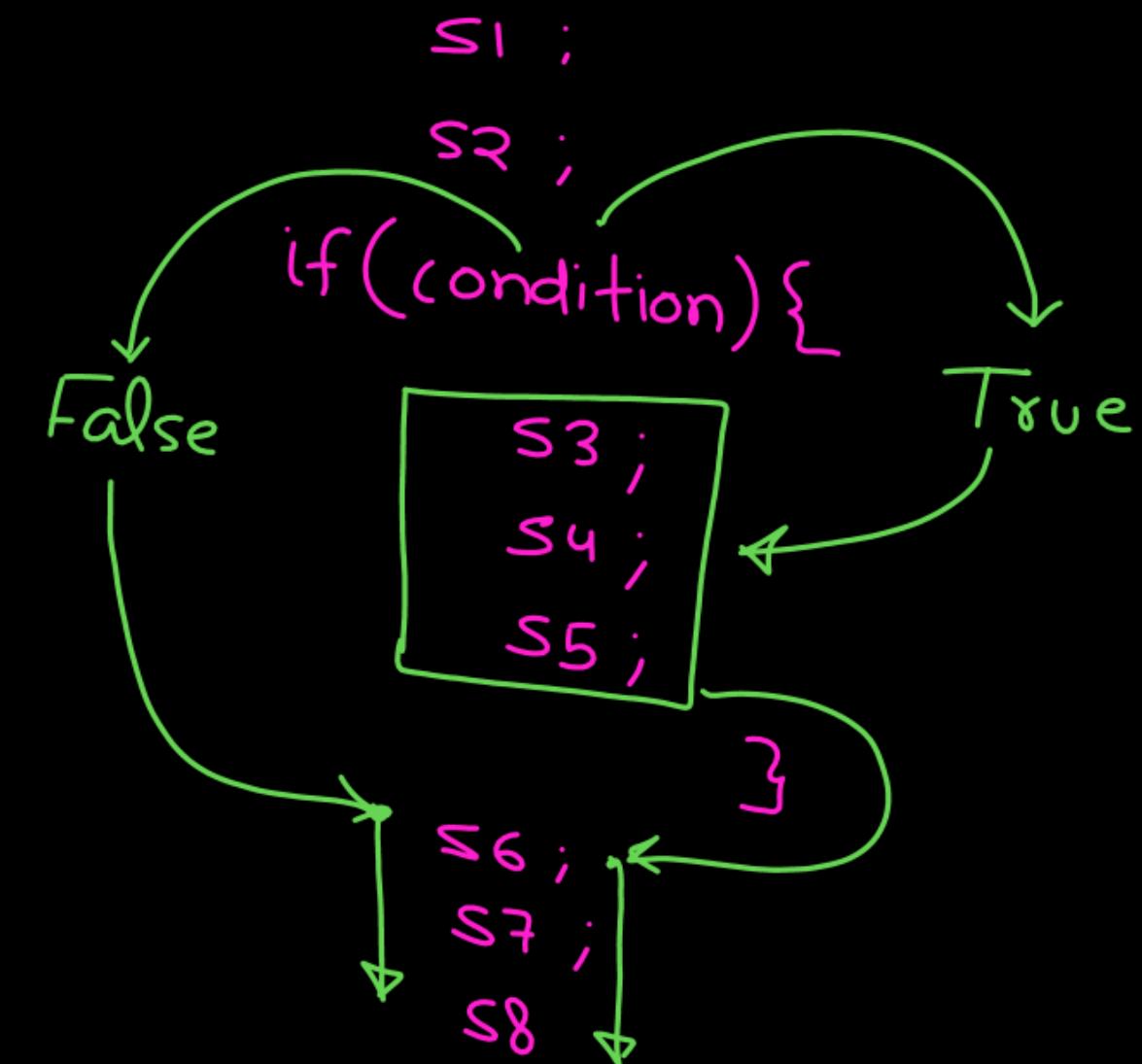
```
s1;
s2;
if(condition){
    s3;
    s4;
    s5;
}
s6;
s7;
s8
```

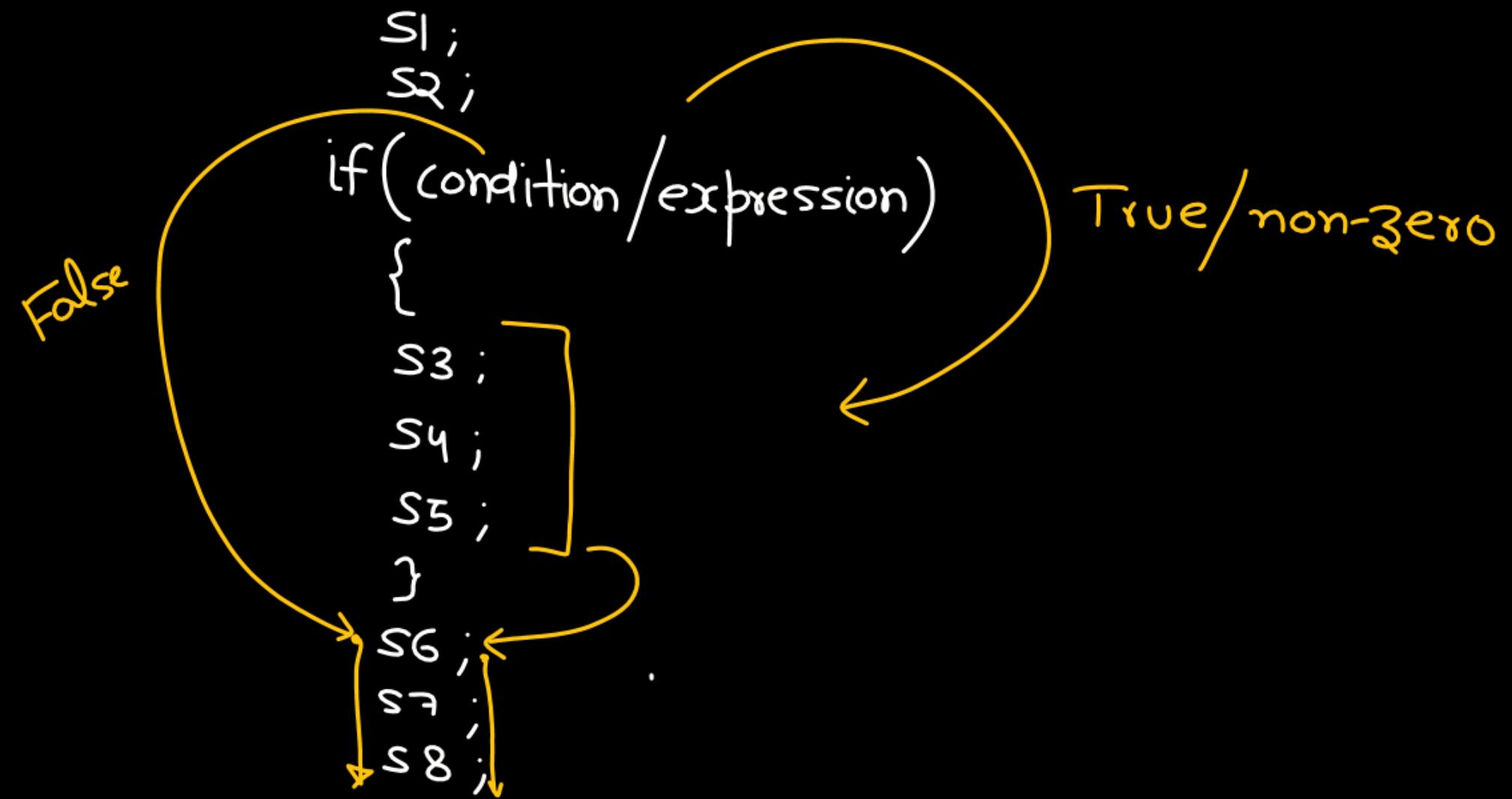
## Selection statement

if statement

$S_1 \rightarrow S_2 \rightarrow S_3 \rightarrow S_4 \rightarrow S_5 \rightarrow S_6 \rightarrow S_7 \rightarrow S_8$

$S_1 \rightarrow S_2 \rightarrow S_6 \rightarrow S_7 \rightarrow S_8$





# Syntax

if(expression/condition)

s<sub>1</sub>;

by default  
the scope of  
if statement is  
till first semi-colon

if ( condition/expression )

{  
s<sub>1</sub> ;  
s<sub>2</sub> ;  
:  
:  
s<sub>n</sub> ;  
}

Scope

if(expression/condition)

S1;



if(exp/condition)  
{

S1;

}

First  
semi-color

```
void main(){
```

```
    printf("Gate"), ✓  
    printf("2023"), ✓  
}
```

```
void main(){
```

```
    int a, b ;  
    ==
```

False

```
if (a > b)
```

```
{
```

```
    printf("Gate"), ✓
```

```
}
```

```
printf("2023"), ✓
```

```
}
```

True

1.

```
void main()
{
    if(5>4) → True
    {
        printf("Hello"); ✓
    }
    printf("Everyone"); ✓
}
```

HelloEveryone

2:

```
void main()
{
    if(2<4){
        printf("Hello"); ✓
        printf("Bachho"); ✓
    }
    printf("Kaise ho"); ✓
}
```

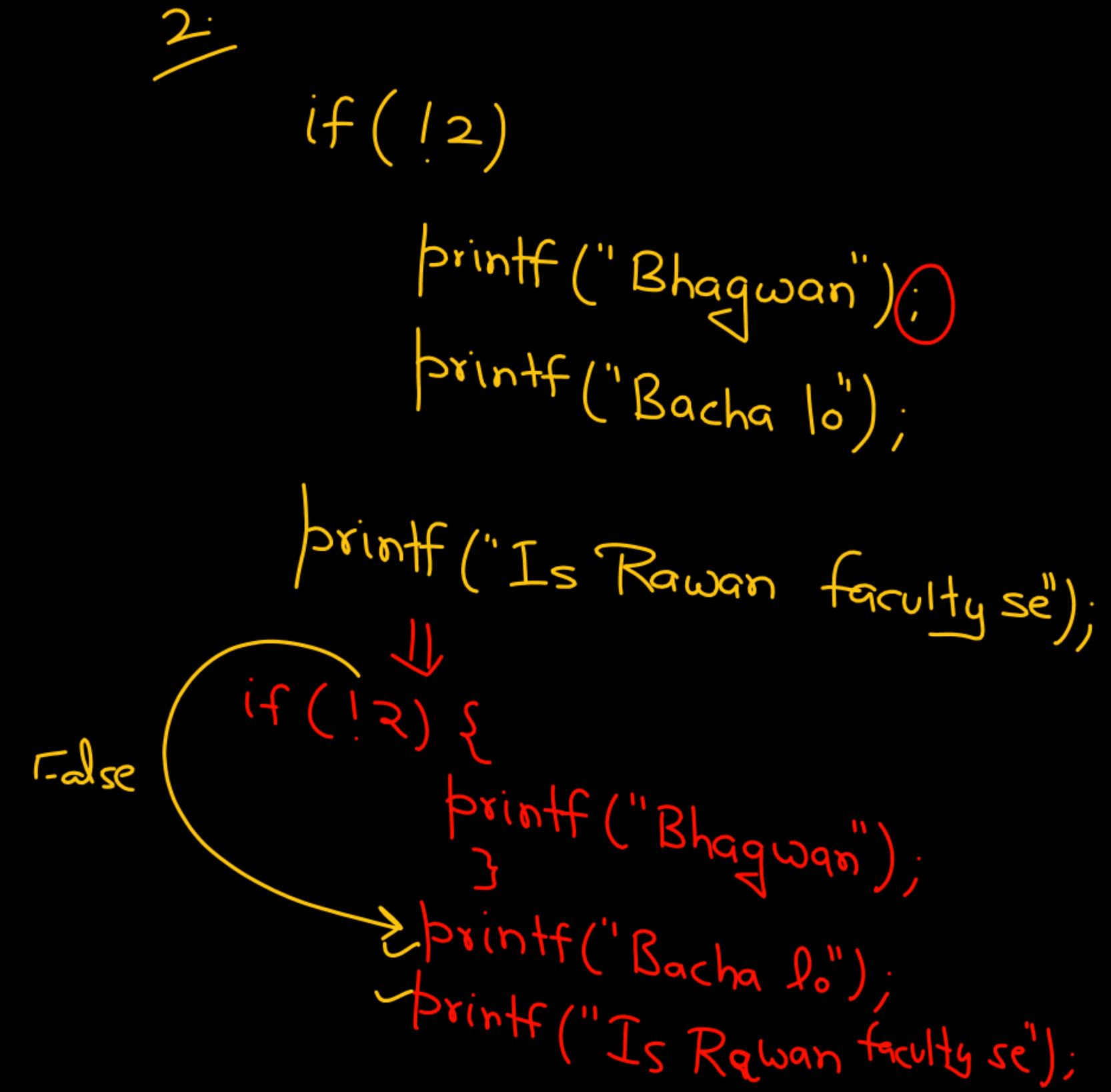
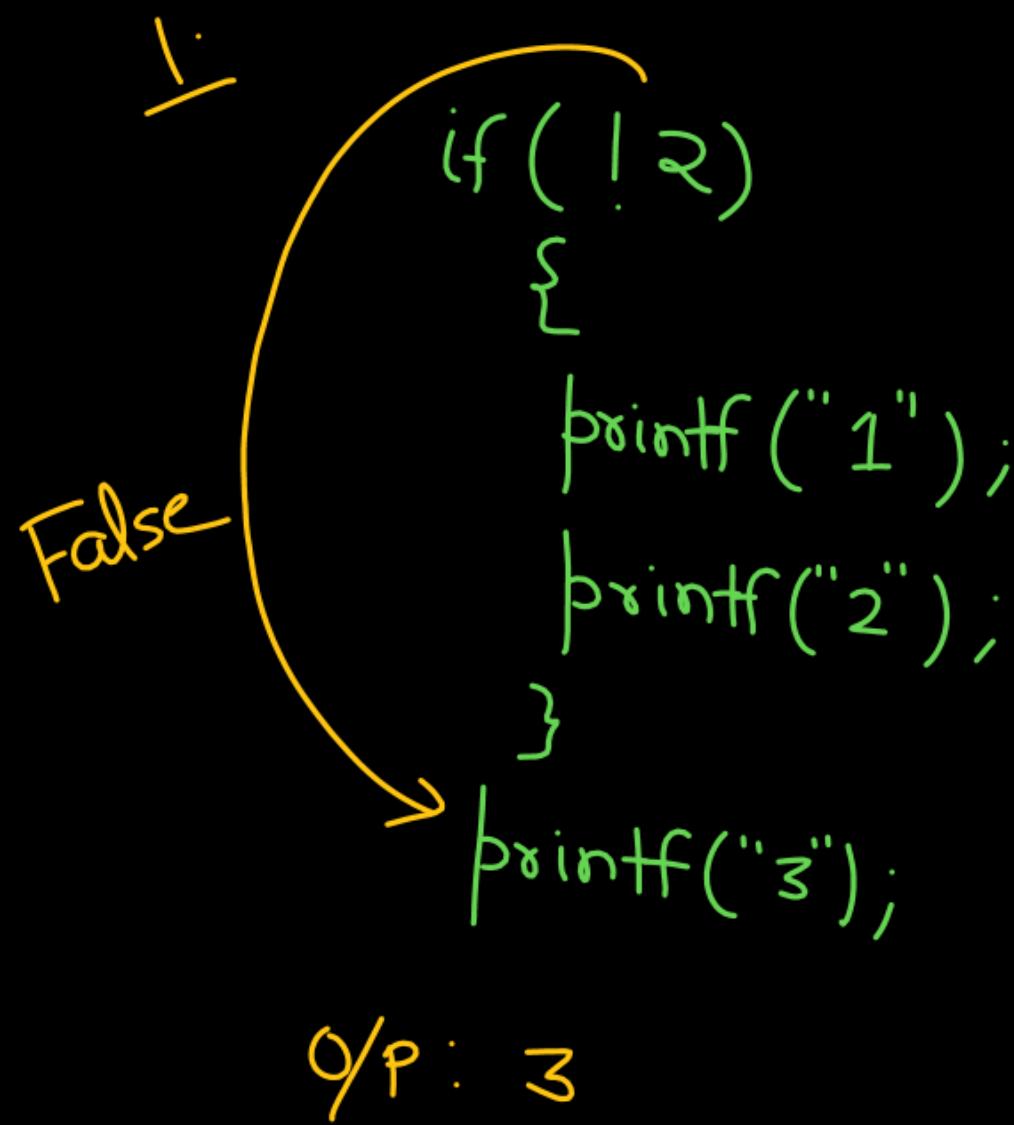
HelloBachhoKaise ho

int i=1; expression  $\Rightarrow$   $i+3 \Rightarrow 1+3 \Rightarrow 4$  non-zero  $\Rightarrow$  true

if ( $i+3$ ) {  
    printf("1"); ✓      123  
    printf("2"); ✓  
}  
printf("3"); ✓

$\text{exp} \Rightarrow \text{value}$

$|z \Rightarrow | \text{non-zero} \Rightarrow | \text{True} \Rightarrow \text{False}$

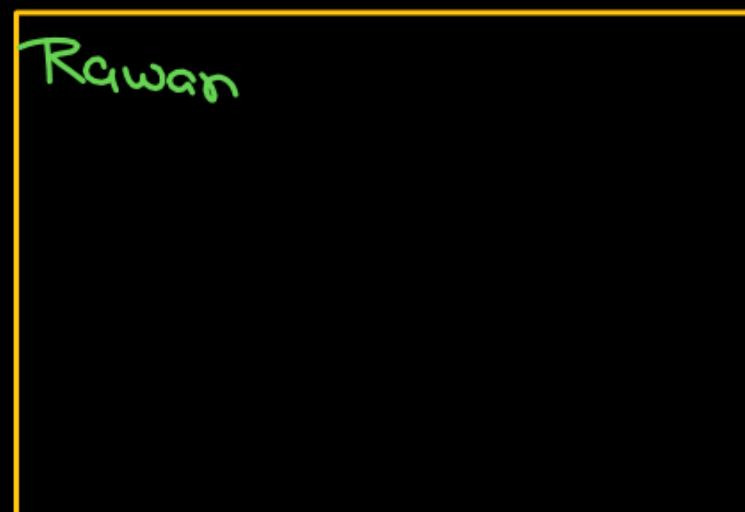


1 void main() {

if( printf("Rawan"))  
{  
    5  
    True  
}

}

O/P :



2:

void main() {

if( ! printf("Pankaj"))  
{  
    6  
    printf("Sharma");  
}

}

Pankaj

1.

```
int i=5;
if (i==5)
{
    printf("Hello");
}
```

$i = 5$  → True

3

Hello

4.

```
if (12.38)
{
    printf("1");
}
```

$12.38 \rightarrow$  non-zero → True

O/P 1

2.

```
int i=0;
if (i=4)
{
    printf("Bye");
}
```

$i = 4$  → True

Bye

3.

```
if(0)
{
    printf("Maza");
}
```

$0 \rightarrow$  False

No O/P

5.

if ( ) → expression is mandatory

```
printf("Ud ke baat");
}
```

O/P: Compilation Error

6.

```
if(2+3*4)
{
    printf("0");
}
    ✓ printf("1");
O1
```

if ( $2 + 3 \times 4$ )

printf("0");  
printf("1");

if ( $2 + 3 \times 4$ ) True  
{  
  printf("0");  
}  
printf("1");

$++a$

- (i) First increase the value
- (ii) use the value

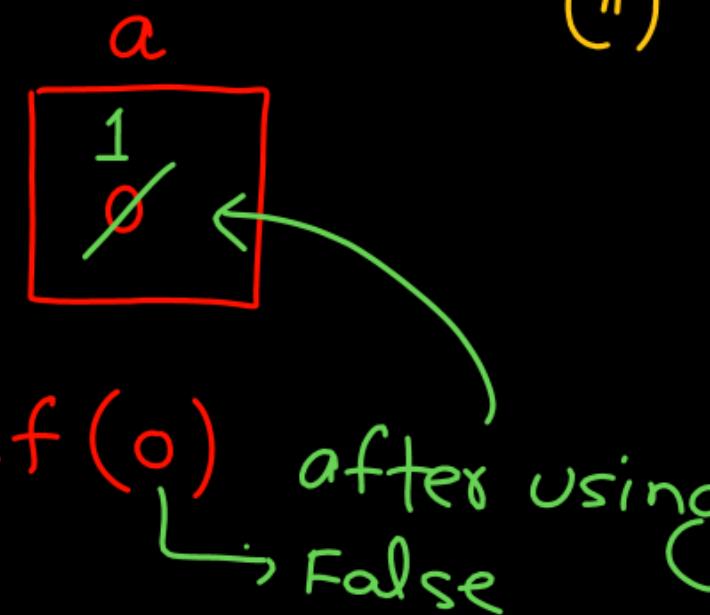
int  $a = 0;$

if ( $a++$ )  
{

    printf("Kaha se agaya");  
     printf("Ye Kambakht");

✓ printf("Pankaj");

O/P: Pankaj

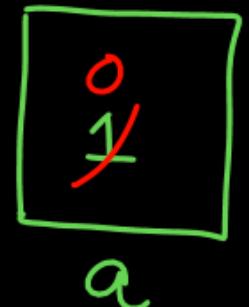


$a++$

- (i) Use the value
- (ii) Then, increase the value

int  $a = 1;$

if ( $--a$ )  
{ if (0)



Predecrement

printf("Pankaj sir");  
 printf("is worst");

✓ printf("Faculty");

O/P: Faculty

1.

```
int i=1;  
if(--i)  
printf("Pankaj");  
printf("./d",i);
```



```
if(--i){  
    printf("Ponkaj");  
}
```

```
printf("./d",i); ✓
```

O/P: 0

Y

```
void main(){
    int i=3;
    if( i > 10)
        printf("Hello");
}
```



```
int i = 3
if (i > 10)
{
    .
    ,
}
printf("Hello");
```

O/P: Hello

20&gt;0

WAP to **read** a **number** and if it is even then print Pankaj as output.

i/p : 13

o/p : No output

i/p : 20

o/p : Pankaj

i/p : 44

o/p : Pankaj

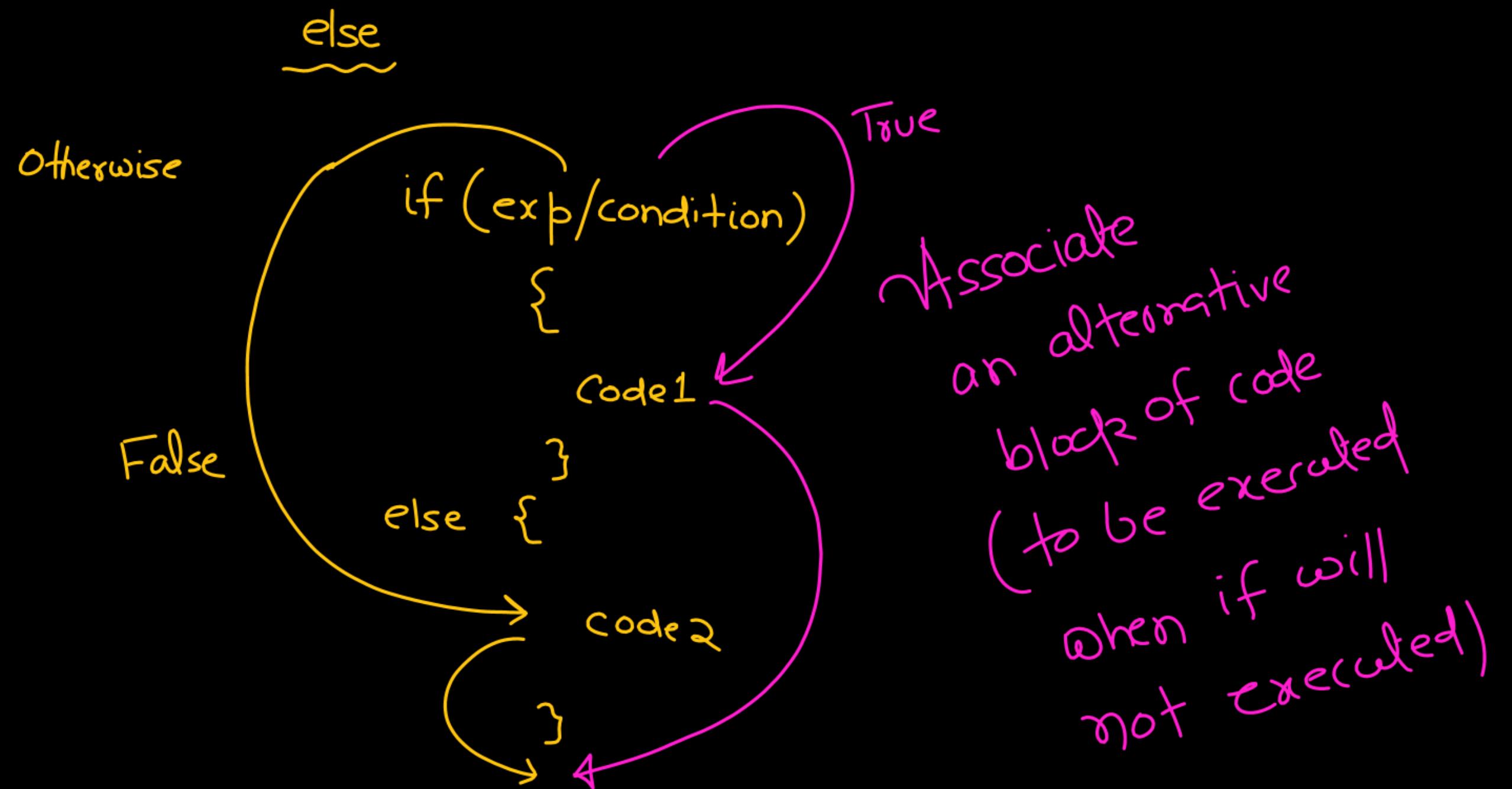
```

int n;
printf("Enter a number");
scanf("%d", &n);
if (n%2 == 0)
    printf("Pankaj");

```

if n is divisible  
by 2

⇒ When we  
divide n by 2  
the rem. must  
be 0.



```
s1;  
s2;  
if(exp/condition)  
{  
    s3;  
    s4;  
}  
else {  
    s5;  
    s6;  
}  
s7;  
s8;
```

$s_1 \rightarrow s_2 \rightarrow s_3 \rightarrow s_4 \rightarrow s_7 \rightarrow s_8$

$s_1 \rightarrow s_2 \rightarrow s_5 \rightarrow s_6 \rightarrow s_7 \rightarrow s_8$

```
int i = 1;  
if (i+2-4) {  
    printf("1");  
    printf("2");  
}  
else {  
    printf("3");  
    printf("4");  
}
```

$$\rightarrow \text{exp} \quad 1+2-4 = -1 \text{ non-zero}$$

Every non-zero  
value is treated  
as true in C

Lang.

0 → False

int i = 1 ; → true

if (i+2-4)

printf("1"); ✓

else

✗ printf("2"); ↗ First  
✓ printf("3"); Semi  
colon

O/P : 13

```
if( !6 ) {  
    printf("Sharma");  
}
```

False

```
void main(){
    else
        printf("0");
}
```

else can not  
be used without  
a previous if

```
void main() {  
    if (!2+3)  
        printf("Hello")  
        printf("Bachho");  
    else  
        printf("Maza");  
        printf("Araha hai naa ?");  
}
```

⇒

```
if (!2+3)  
{  
    printf("Hello");  
}  
printf("Bachho");  
else {  
    printf("Maza");  
}  
printf("Araha hai naa ?");
```

WAP to take a number and if the no. is even , it will print 1 , if the no. is odd print 0.

```
int n;
printf("Enter a number");
scanf("%d", &n);
if( !(n%2) )
    printf("1");
else
    printf("0");
```

```
if( n%2 )
    printf("1");
else
    printf("0");
```

Odd no. value  
 $n \% 2$  ①  
True

```
if( n%2 )
    printf("0");
else
    printf("1");
```

①

```
if (expression)
{
```

```
    ==
}
```

②

```
if (expression)
{
```

```
    Code 1
}
else {
```

Code 2

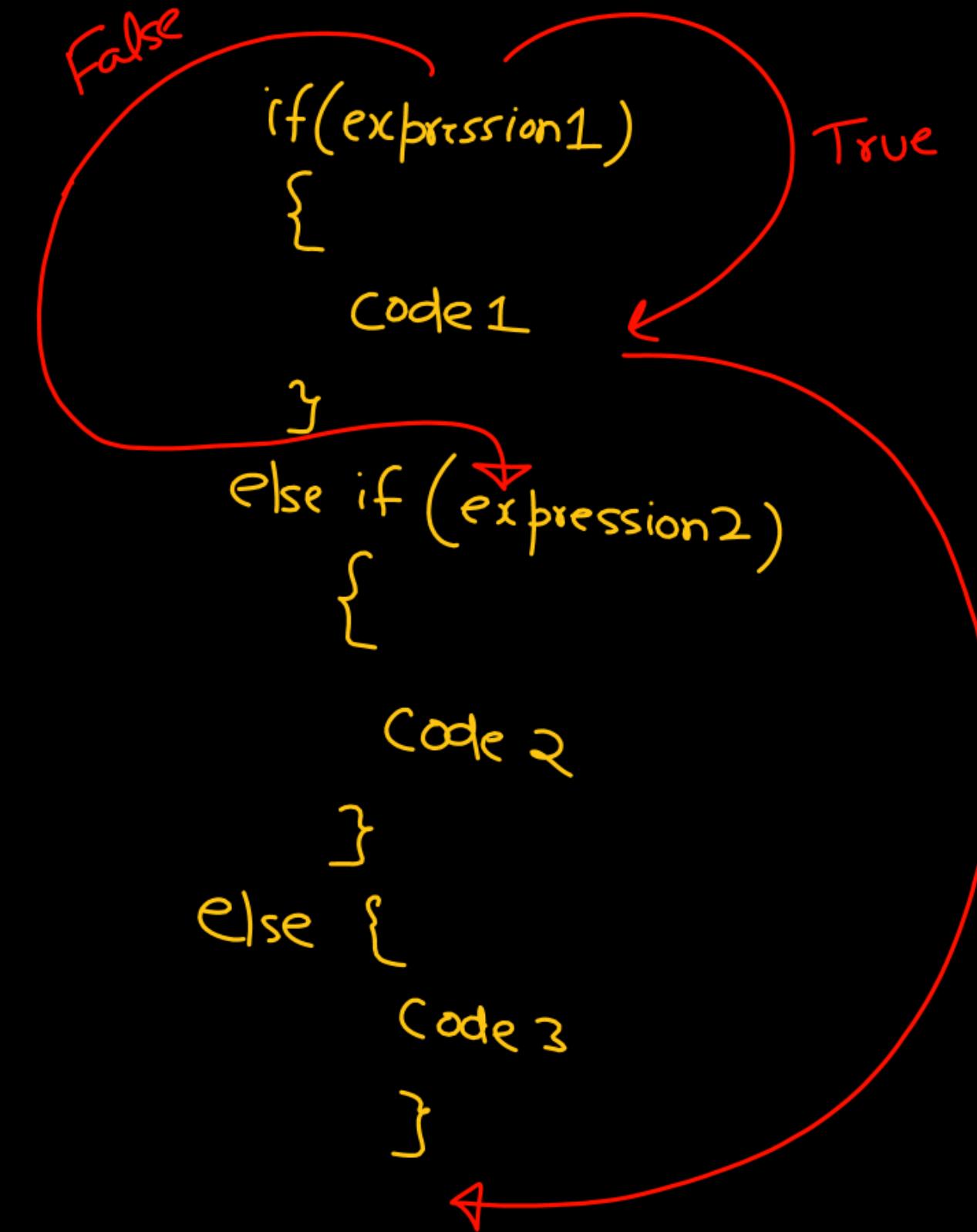
```
}
```

Take a integer as i/p

- If it is less than 0 ⇒ print Negative
- If it is greater than 0 ⇒ Positive
- If it is zero ⇒ Zero

else if

```
if (expression1)
{
    Code 1
}
else {
    Code 2
}
```



①

Code 1

Code 2

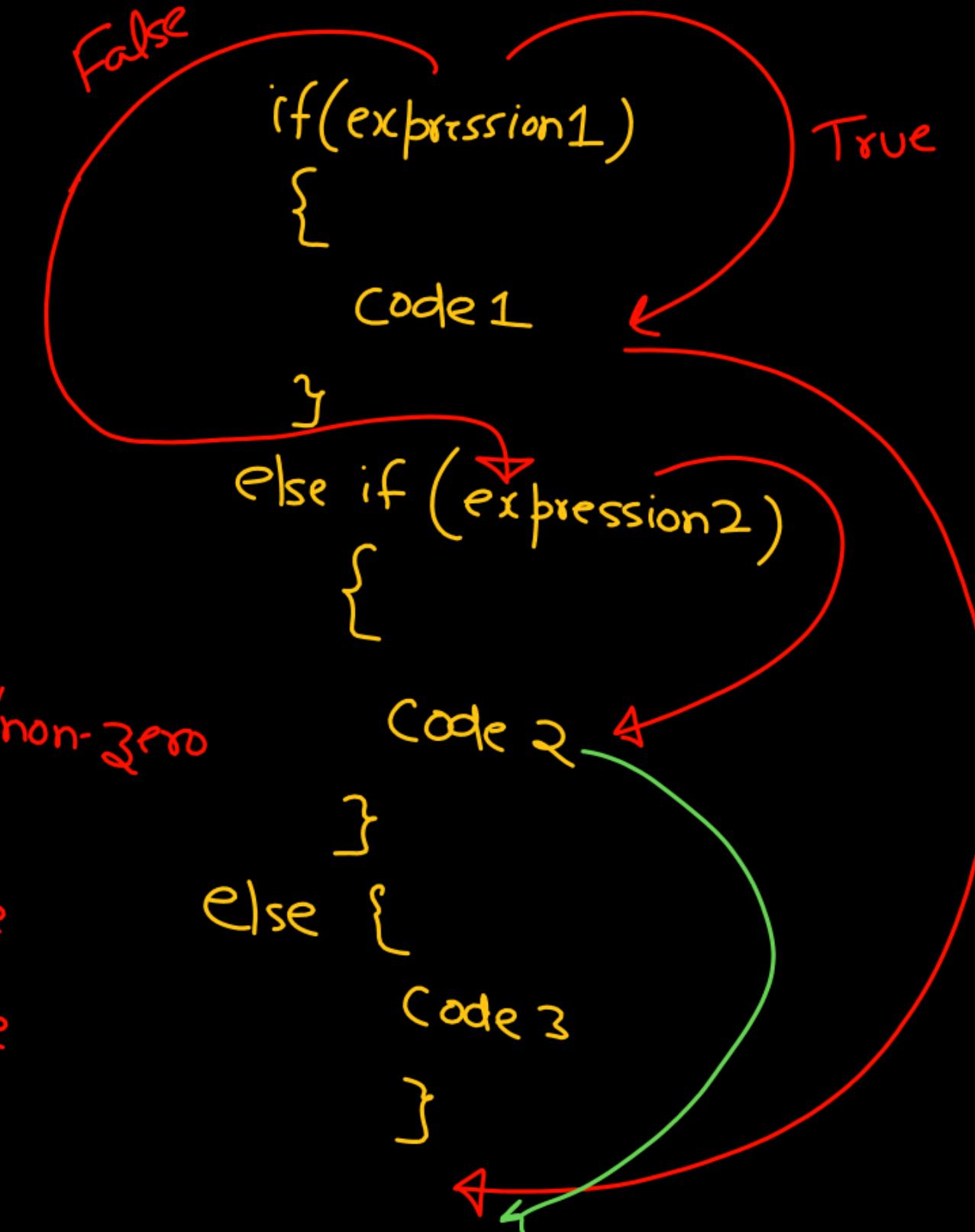
Code 3

exactly 1  
of them  
will execute

Code 1 : expression1  $\Rightarrow$  true/non-zero

Code 2 : expression1  $\Rightarrow$  False  
expression2  $\Rightarrow$  true

Code 3 : Exp1  $\Rightarrow$  False  
Exp2  $\Rightarrow$  False



```
if (!3)
    printf("Hello");
else if (3+6-9)
    printf("Bachho");
else
    printf ("Ye Rawan Faculty hai");
```

```
if(2)
    printf("1");
else if(3)
    printf("2");
else if(4)
    printf("3");
else
    printf("4");
```

O/P: 1

```
if(2)
    printf("1");
if(3)
    printf("2");
if(4)
    printf("3");
if(5)
    printf("4");
```

2

3

4

largest among 2 numbers

```
int a,b,max;  
printf("Enter 2 numbers");  
scanf("./d./d",&a,&b);  
max = a>b ? a : b;  
if(a>b)  
    max = a ;  
else  
    max = b ;  
printf("./d",max)
```

$a = 30$   
 $b = 20$   
 $c = 10$

3 distinct numbers  $\Rightarrow$  Find largest.  
a, b, c

if ( $a > b \&\& a > c$ )

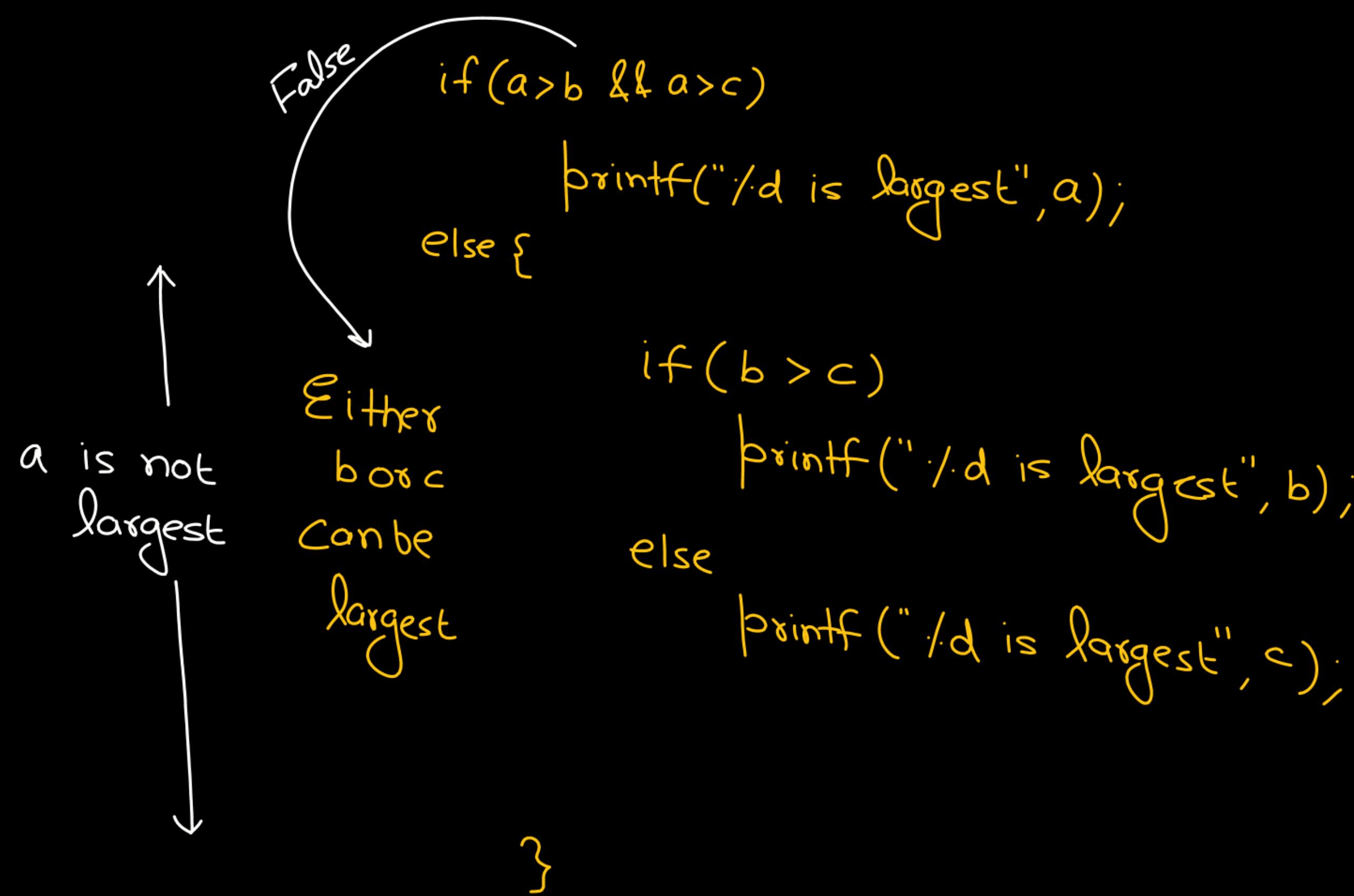
printf("./d is largest", a); ✓

if (b > a  $\&\&$  b > c)

printf("./d is largest", b);

if (c > a  $\&\&$  c > b)

printf("./d is largest", c);



if(exp)  
{  
  ;  
}  
OR  
if(exp)  
  ; ;

if(exp)  
{  
  ;  
}  
else {  
  ;  
}  
else if(exp2)  
{  
  ;  
}  
else if(exp3)  
{  
  ;  
}  
else {  
  ;  
}

if(exp1)  
{  
  ;  
}  
else if(exp2)  
{  
  ;  
}  
};

3 distinct Numbers

4 distinct no.

$\text{max} = (a > b \& a > c) ? a : \boxed{b > c ? b : c}$

False

will it work  
for any 4  
Numbers

H.W

$\text{max} = (a > b \& a > c \& a > d) ? a : (b > c \& b > d) ? b : (c > d) ? c : d;$

Write a prog. to find largest among  
4 no.

