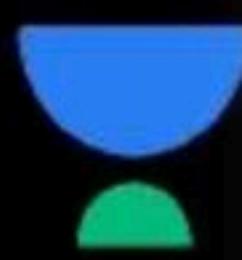






# Control flow statements - Part I

Comprehensive Course on C- Programming

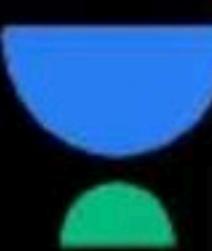


# CS & IT Engineering

C Programming  
Control Flow statements-I







# Topics

*to be covered*

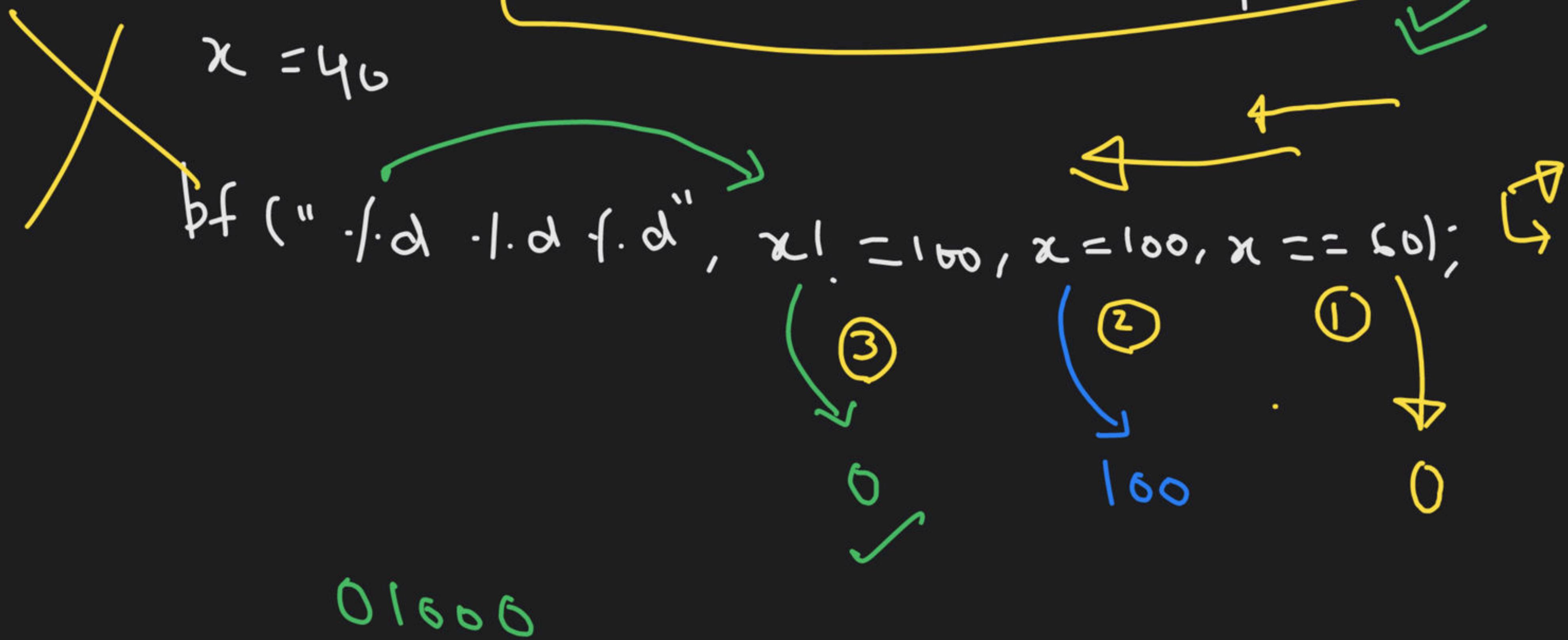


1

Selection statements

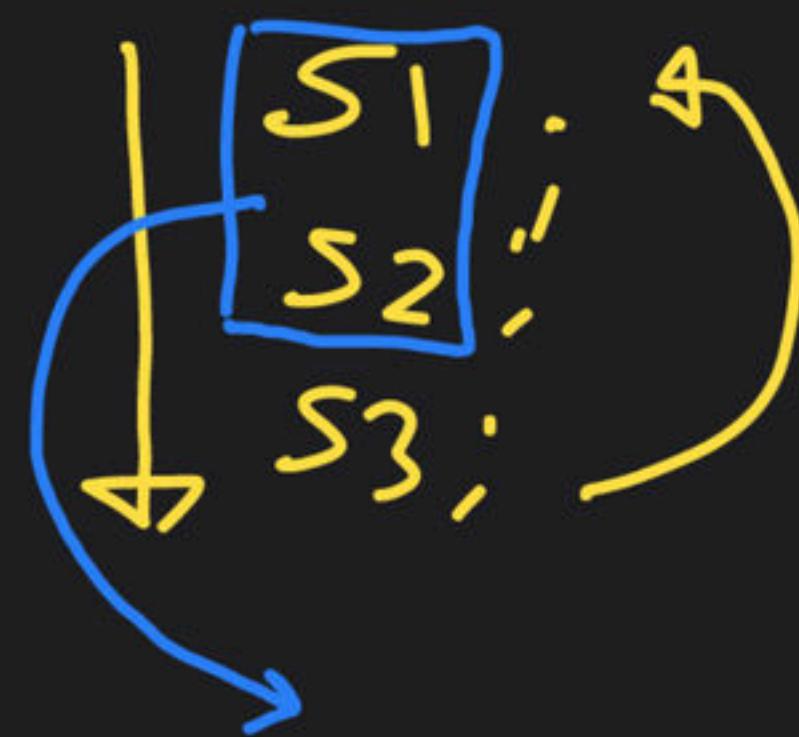
~~x = 46  
x = 100~~

Undefined behaviour of printf.



# Flow control statement

```
Void main() {  
    S1;  
    S2;  
    S3;  
    S4; }  
    | by-default  
    | flow of execution  
    ↓  
    → Sequential
```



Statements that controls, the flow of execution  
of statements  $\Rightarrow$  Control flow statements.

### CFS



1) Selection statements : if , if - else , if - else if - else ,  
switch statement .

2) Iterative statements (Repetition) : loops  $\xrightarrow{\text{for}}$   $\xrightarrow{\text{while}}$ ,  $\xrightarrow{\text{do while}}$

3) Jump statements : continue, break, exit, return

# Selection Statement

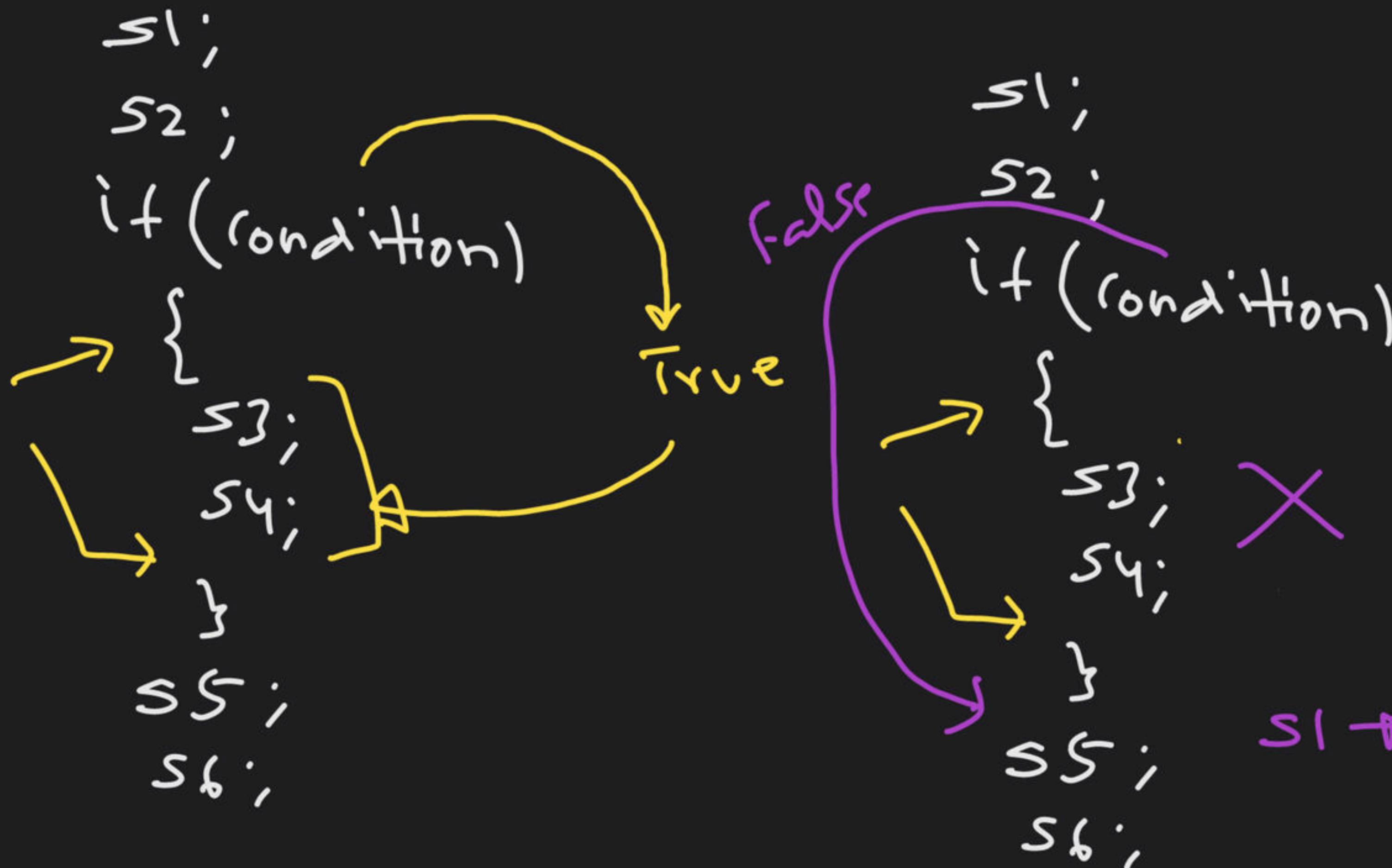
if statements

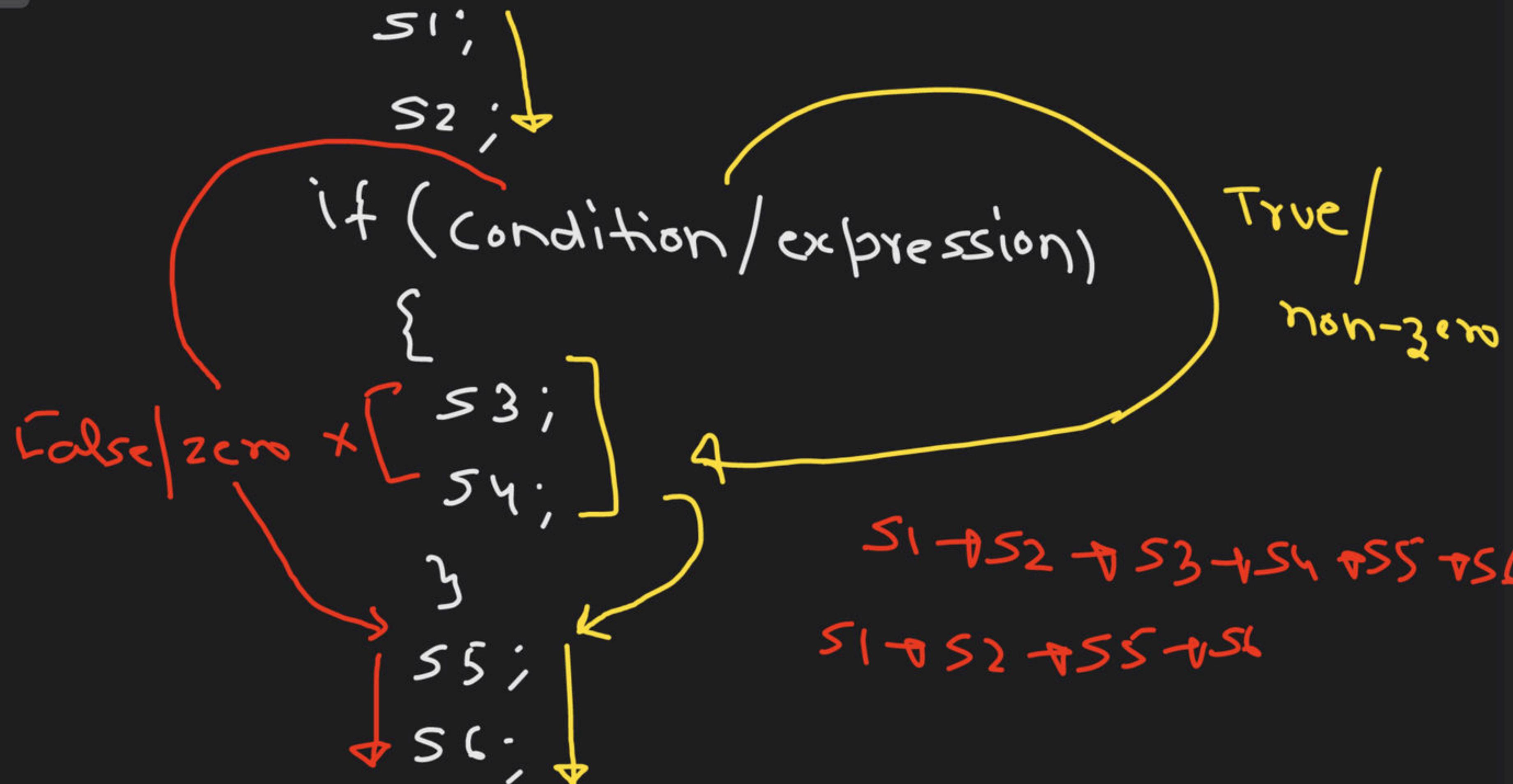
```
void main() {  
    S1;  
    S2;  
    S3;  
    S4;  
    S5;  
    S6; }
```

Sew.

```
void main() {  
    S1; ✓  
    S2; ✓  
    if ( condition ) {  
        S3;  
        S4; } ←  
    S5; ✓  
    S6; ✓ } ←
```

$s_1 \rightarrow s_2 \rightarrow s_3 \rightarrow s_4 \rightarrow s_5 \rightarrow s_6$





# Syntax

```
if ( condition | expression )
{
    S1;
    S2;
    S3
}
```

*scope*

if ( condition | expression )

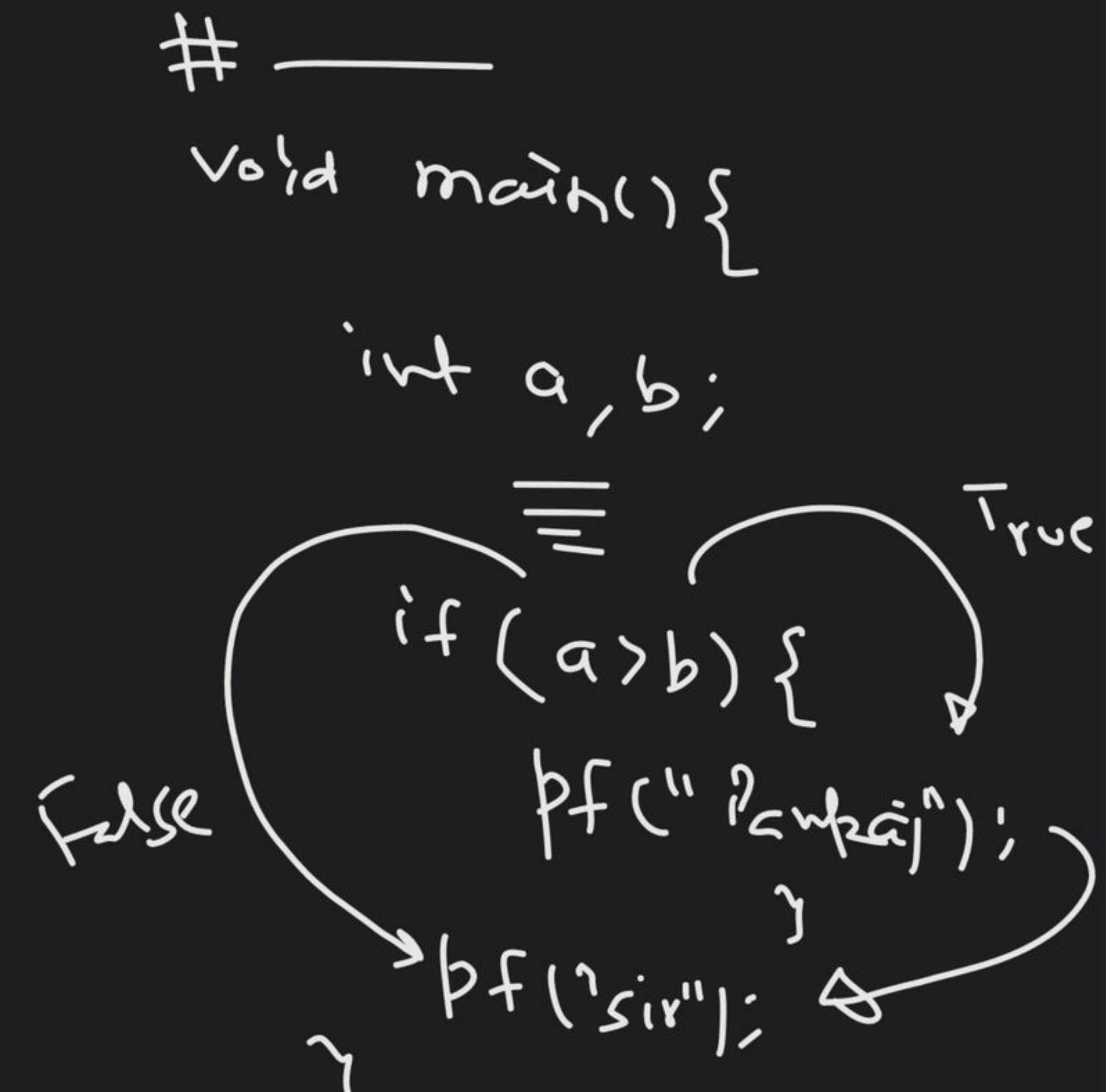
S1;  
S2;  
S3;

by default  
the scope is  
till first  
Semi-colon

↓ for compiler

if ( cond | exp ) {  
 S1;  
 S2;  
 S3;

```
#include <stdio.h>  
void main(){  
    printf("Pankaj");  
    printf("Sir");  
}
```

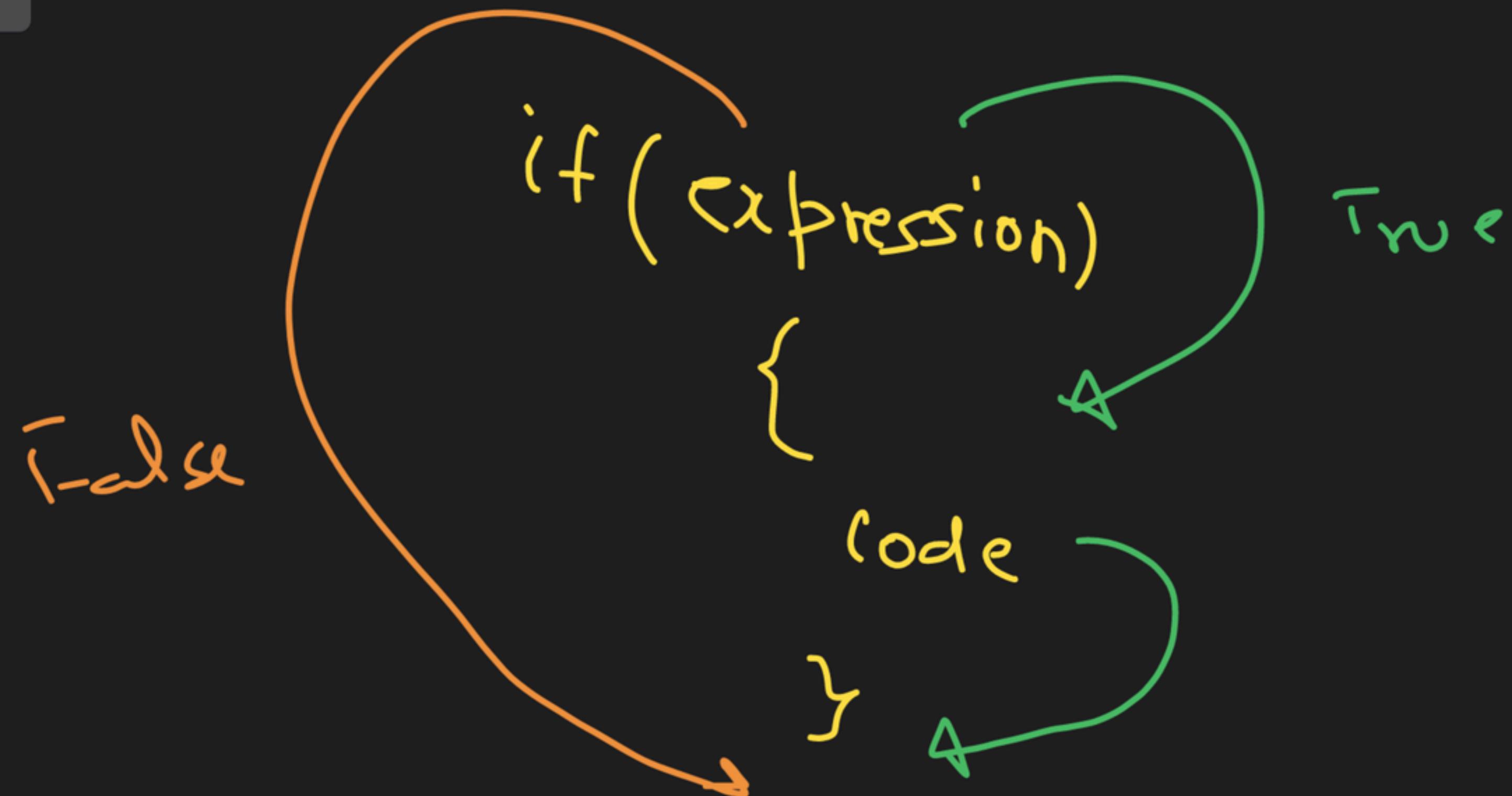


```
void main(){
    bf("1"); ✓
    if (2 < 3){
        [ bf("2"); ↗
        bf("3");
    }
    bf("4"); ✓
}
```

inp

1 → 2 → 3 + 4

O/P: 1234



2.

```
int i = 3;
if (i-2) {
    pf("Pankaj");
    pf("Rewan");
}
pf("Siv");
```

$i - 2 \Rightarrow 3 - 2 \Rightarrow 1$  (non-zero)

True

PankajRewanSiv

True

3.

```
Void map() {
```

```
    pf("Hey"); ✓
```

```
    if (20) { → non-zero/True
```

```
        pf("Bhagwan"); ]
```

```
        pf ("Bacha Do"); } ↗
```

```
    pf("Is Rougher"); ✓
```

```
4. void main(){
    pf("Hey");
    if (!20)
        printf("Bhagwan");
        printf("Bacha Lo");
        printf("Is Rawan se");
}
```

for  
compile

if ( !20) {  
 ✓ pf("Hey");  
 ✓ if ( !20) {  
 ✓ printf("Bhagwan");  
 ✓ }  
 ✓ printf("Bacha Lo");  
 ✓ printf("Is Rawan se");  
}

```
Void main() {  
    if (printf("Pankaj"))  
    {  
    }  
}
```

Pankaj

if (1) {  
} True  
}

```
Void main() {  
    if( !.printf("Pankaj"))  
    {  
        printf("Rawan hai");  
    }  
}
```

⇒

Pankaj  
false  
if( !(.){  
== X  
})

Void main()

int i=4;

if (i == 4) → Comparison  
True

printf("Pankaj"); ↴

↳

O/P: Pankaj

2. void main() {  
int i = 6;  
if (i == 4) {  
printf("Pankaj");  
}  
}

i [64]

True/non-zero

Pankaj

```
Void main(){
    if (0)
        pf("Panraj");
    pf("Sharma"); ✓
}
```

O/P: Sharma

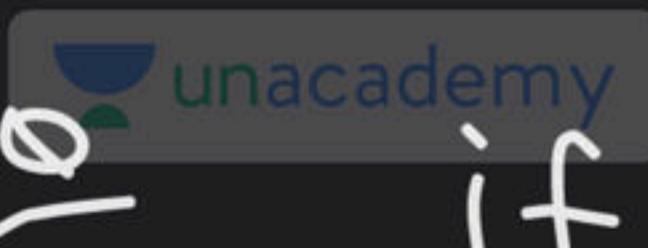
41

```
Void main(){
    if (17.28) true
        pf("1");
    pf("2");
}
```

1 2

```
if ( ) {  
    cout << "Hello";  
}
```

Syntax Error  
Vd Re laat Pdegi



if (~~'2 + 3 × 5'~~ <sup>21</sup>)  
Triv  
bf ("2");  
bf ("3");

23

Q

```
int i = 0;  
if (i++)  
{  
    printf("Hello");  
}  
.
```

Post inc → var → 0

i [ 0 ]

if (0) {  
 printf("Hello");  
}

O/P: No O/P

Q # \_\_\_\_\_

Void main() {

int i = 1;

if (--i)

bf("1");

bf("./d", i);

}

for  
→  
(complex)

i 

1
0

void main() {

int i = 1;

false

if (--i) {

  bf("1");

}

  bf("./d", i); 0

}

Void main() {

int i=4;

if (i<2) ;

printf("Pankaj");

}



int i=4;

if (i<2){

    false

    ;

}

    printf("Pankaj");

O/P : Pankaj

Anna 24 Ghante Chauhan

WAP to read a no. and if the no. is even then print "Pankaj".

i/P : 13

O/P : No output

i/P : 103

O/P : No output

i/P : 4

O/P : Pankaj

and if the no. is even then print

```
int a;
```

```
printf("Enter a number");
scanf("./d", &a);
```

```
if (a/2 == 0)
```

```
printf("Pankaj");
```

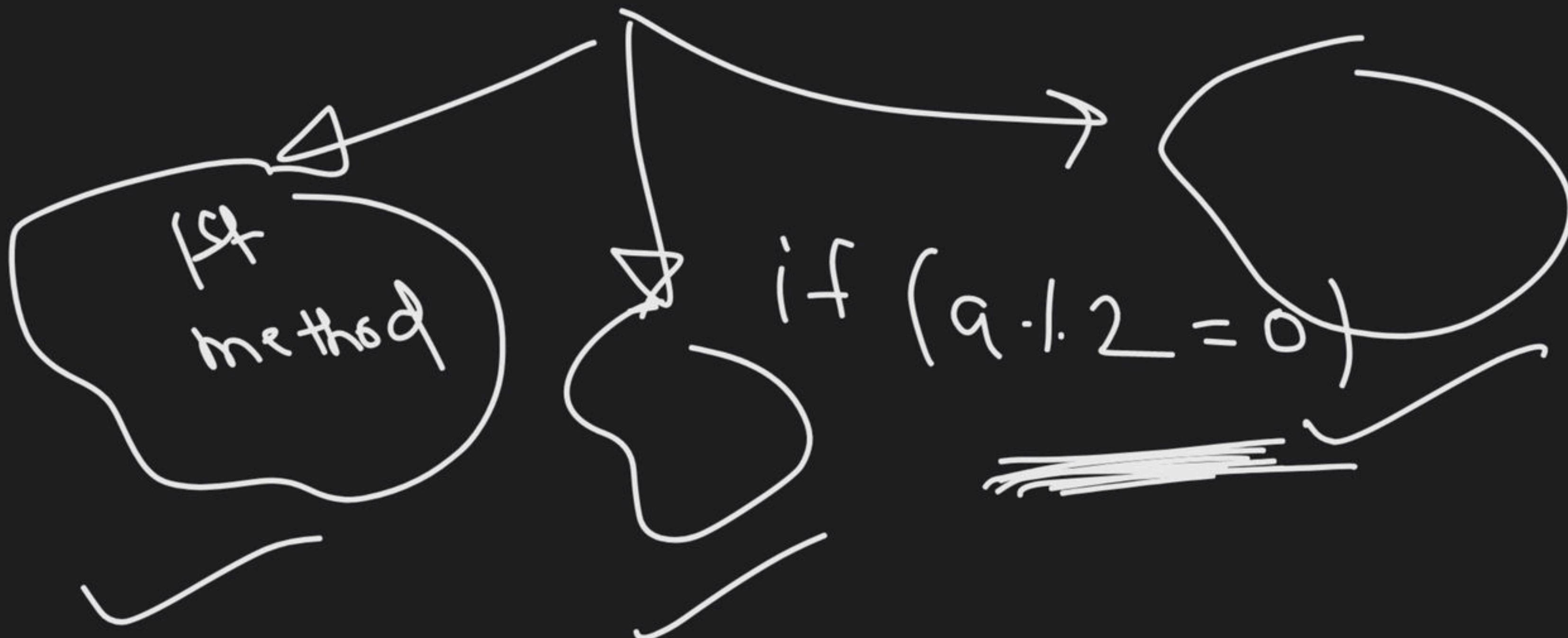
$$x = 2x \Rightarrow \text{Even}$$

Diagram showing a wavy line pointing to a box containing '0'. An orange arrow points from the box to the term  $2x$ . Above the equation, the text 'last bit' is written above the equals sign.

$$x = 2x + 1 \Rightarrow \text{Odd}$$

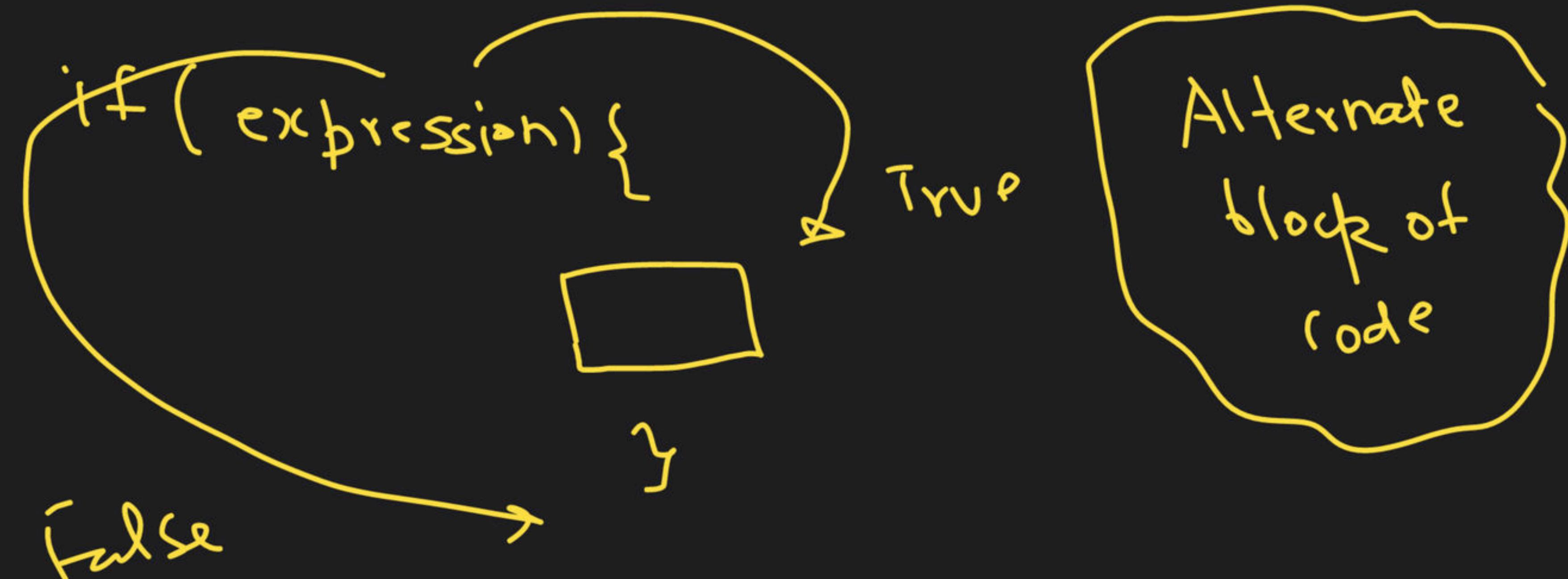
Diagram showing a wavy line pointing to a box containing '1'. An orange arrow points from the box to the term  $2x + 1$ . Below the equation, the text 'last bit' is written below the equals sign.

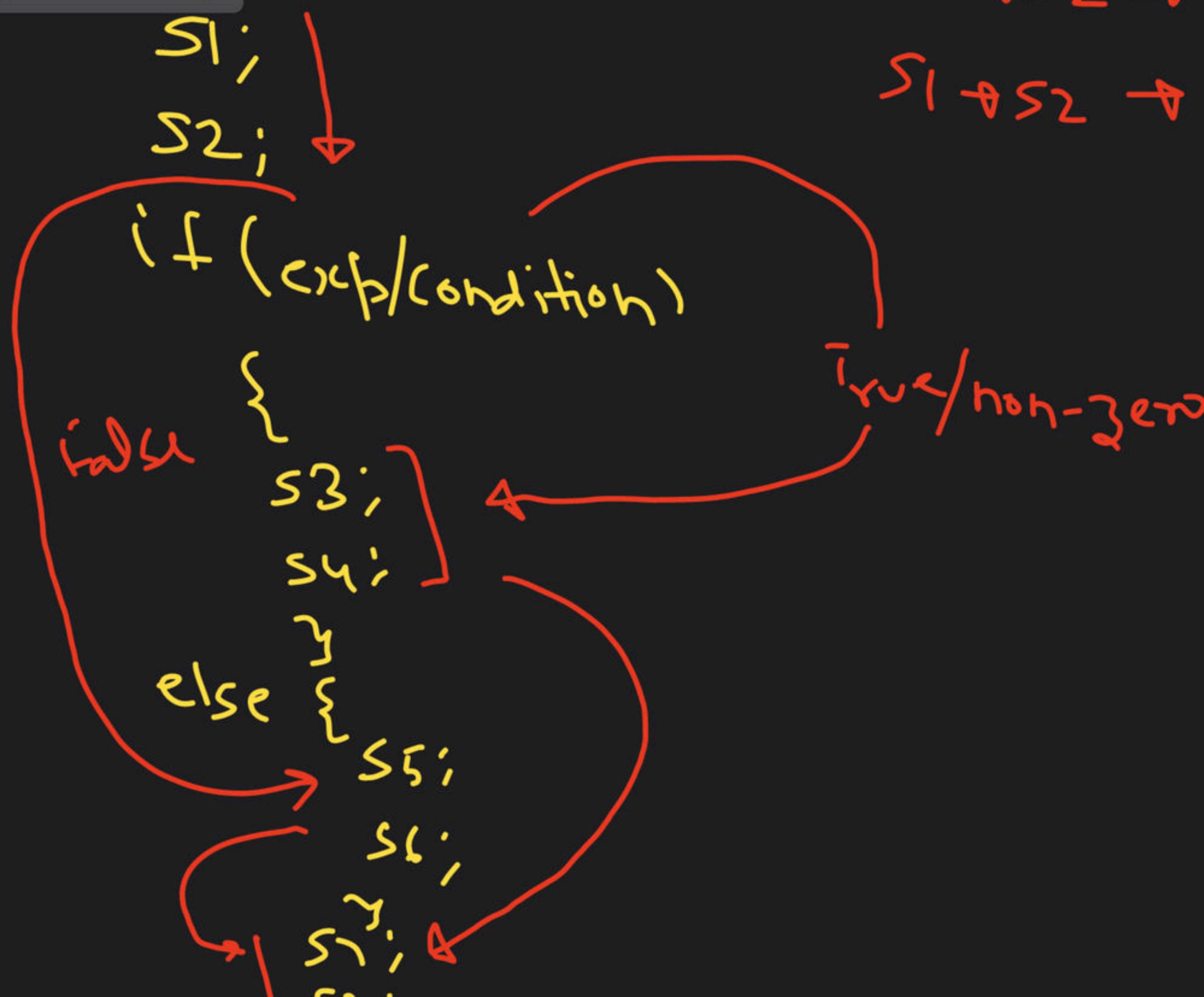
PDSA



Otherwise

## if - else Statement





$S_1 \rightarrow S_2 \rightarrow S_3 \rightarrow S_4 + S_7 \rightarrow S_8$

$S_1 + S_2 \rightarrow S_5 \rightarrow S_6 \rightarrow S_7 \rightarrow S_8$

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

Code 1 will associate  
an alternate  
block of code -

- 1) Either Code 1 or Code 2  
will execute.
- 2) Both will not execute.
- 3) Exactly one of  
them will execute

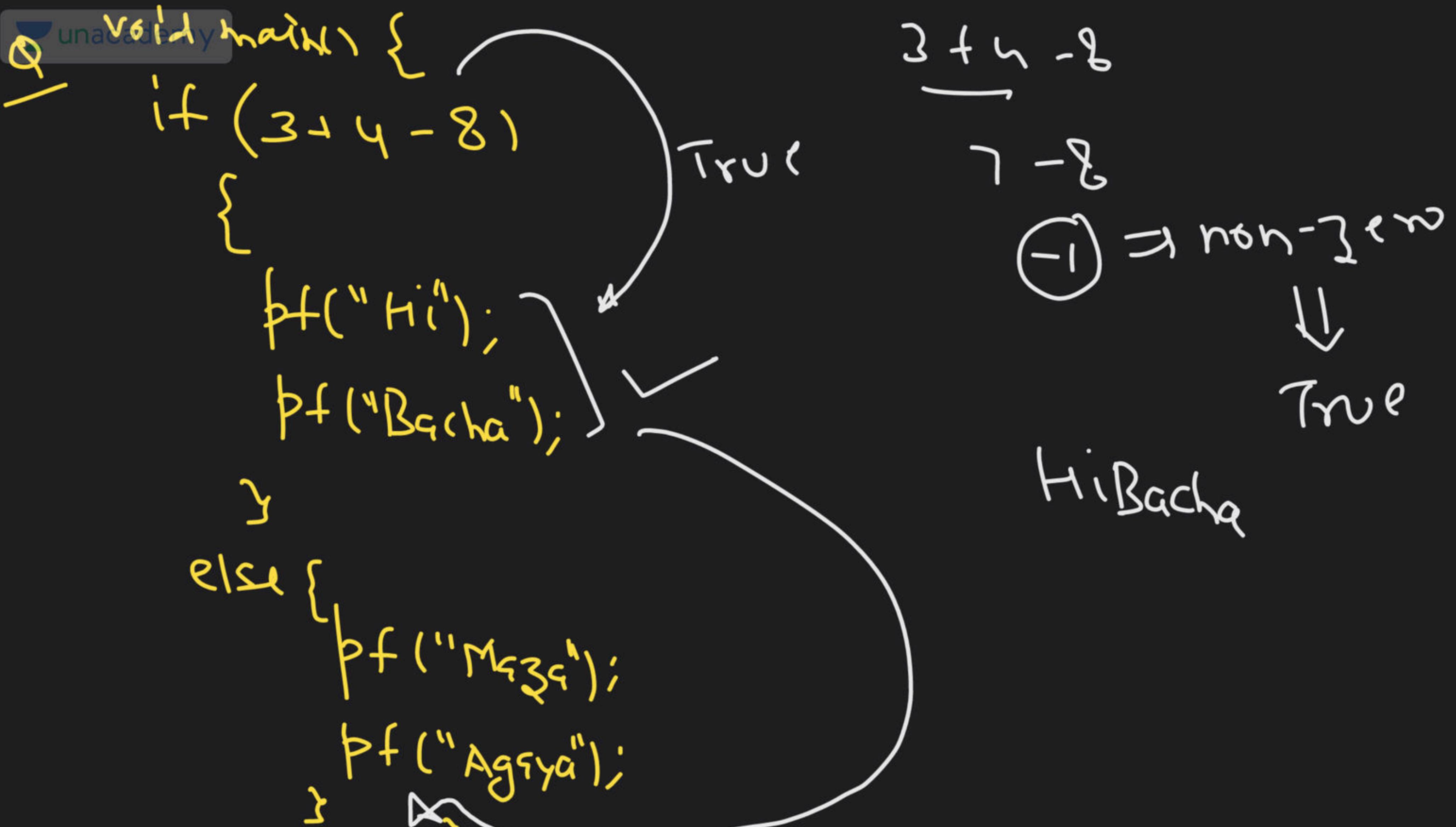
```
Void main () {
```

```
else
```

```
    printf ("Hello");
```

```
}
```

Vd Re laat



```
int i=4;  
if (i+2-6 == 0)  
    printf("Hi");  
else  
    {  
        printf(" 2");  
        printf("Bacha");  
    }
```

O/P: 2Bacha

```
int i=4; // i+2-5 = 1  
if (i+2-5) // True  
    printf("Hi");  
else  
    {  
        printf("Bac");  
        printf("e");  
    }
```

O/P: Hi2

```
if (!2+3)
```

```
printf("1")();
```

```
printf("2");
```

```
else
```

```
printf("3")();
```

```
printf("4");
```



```
if (!2+3) {
```

```
    printf("1");
```

```
    printf("2");
```

```
else {
```

```
    printf("3");
```

```
}
```

```
    printf("4");
```

to take a integer from KB, if the no. is even  
prog will print 1 , otherwise            prog will print 0.

```
int a;  
bf("Enter a no");  
sf(".1 d", &a);  
if (a % 2 == 0)  
    bf("1");  
else  
    bf("0");
```

```
if (exp) {  
    code  
}  
  
else {  
    if (exp) {  
        code 1  
    }  
    code 2  
}
```

Take a integer , if i/p is greater than 6  $\Rightarrow$  "POSITIVE"      O/P  
if " " less than 0  $\Rightarrow$  "NEGATIVE"  
" i/p is 0  $\Rightarrow$  "ZERO"

else if

```

if(exp1/cond)
{
    false
}

```

True/non-zero

Code 1

```

else if(exp2/cond)
{
    false
}
else {
}

```

True

Code 2

Code 3

Code 1

Code 2

Code 3

Only One  
among them will  
execute

- Exactly one of them

Code 1:  $\text{Exp1} \Rightarrow \text{True/non-zero}$

Code 2:  $\text{Exp1} \Rightarrow \text{False}$

$\text{Exp2} \Rightarrow \text{True}$

Code 3:  $\text{Exp1} \Rightarrow \text{False}(\text{both})$

if (!1)  
    bf("Pankaj");  
else if (!2)  
    else bf("Sir");  
else  
    bf("Rawan Faculty Hain");

O/P:

Rawan Faculty Hain

if (10)  
    bf("10"); ✓  
if (20)  
    bf("20"); ✓  
else  
    bf("100"); ✗

1020

```
if (2)
    pf("2");
if (3)
    pf("3");
if (4)
    pf("4");
```

O/P : 2 3 4

```
if (2)
    pf("2");
else if (3)
    pf("3");
else if (4)
    pf("4");
```



```
void main() {  
    if (exp)  
    {  
        code 1  
    }  
    else if (exp)  
    {  
        code 2  
    }  
    else if (exp)  
    {  
        code 3  
    }  
}
```

**at most one** of them will execute

```
if (o) {  
    ...  
}  
else if (t) {  
    ...  
}  
else if (b) {  
    ...  
}  
else if (d) {  
    ...  
}
```

```
if (exp1)
{
    code 1
    ;
}
else if (exp2) {
    code 2
    ;
}
else if (exp3) {
    code 3
    ;
}
else {
    code 4
}
```

{ Exactly 1 among  
Code 1, Code 2, Code 3,  
Code 4  
will execute }

Largest among 2 no.

# —

void main() {

int a, b, max;  $\Rightarrow$

bf("Enter two numbers");

sf(".1.d .1.d", &a, &b);

max = a > b ? a : b

bf(".1.d", max); }

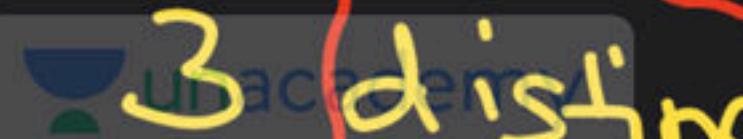
bf —

sf —

if (a > b)

max = a;

else max = b;



3 distinct no. a, b, c

```
if (a > b || a > c)      a = 30
                           b = 20
                           c = 10
   bf("a is largest", a);
if (b > a || b > c)
   bf("b is largest", b);
if (c > a || c > b)
   bf("c is largest", c);
```

```
if (a>b || a>c)
    pf("./d is largest",a);
else {
    if (b>c)
        pf("./d is largest",b);
    else
        pf("./d is largest",c);
}
```

↑  
a is not largest  
Candidates for  
largest ⇒ b,c  
↓

3 distinct no.  $a, b, c$

False

$b, c$

is largest

largest =  $(a > b \text{ || } a > c) ? a : b > c ? b : c$

" 4 distinct no.,  $a, b, c, d$

largest =  $(a > b \text{ || } a > c \text{ || } a > d) ? a : (b > c \text{ || } b > d) ? b : (c > d) ? c : d$

bitwise operations

```

if(a & 1 == 0)
    printf("Parba");

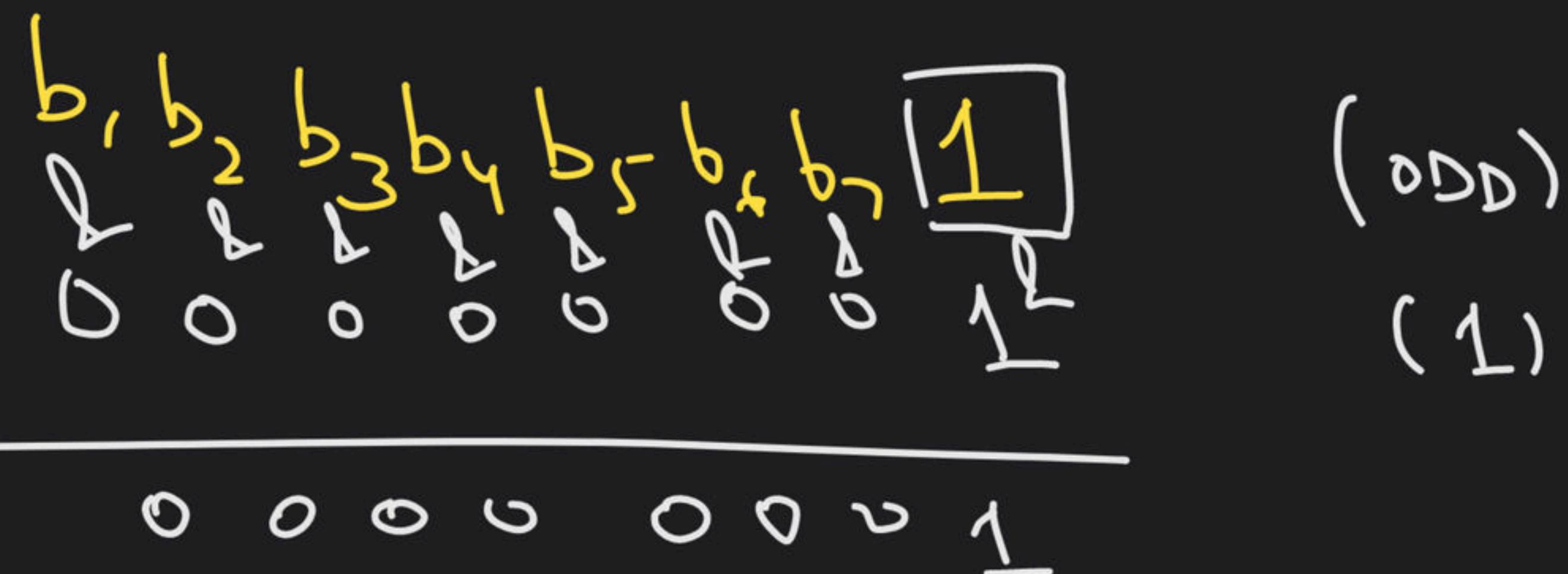
```



```

printf("Parba");

```



Aditya



undefined  
behaviour



int x = 5, y;

y = ++x + ++x + x++;

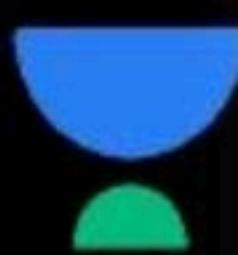
Sequence point



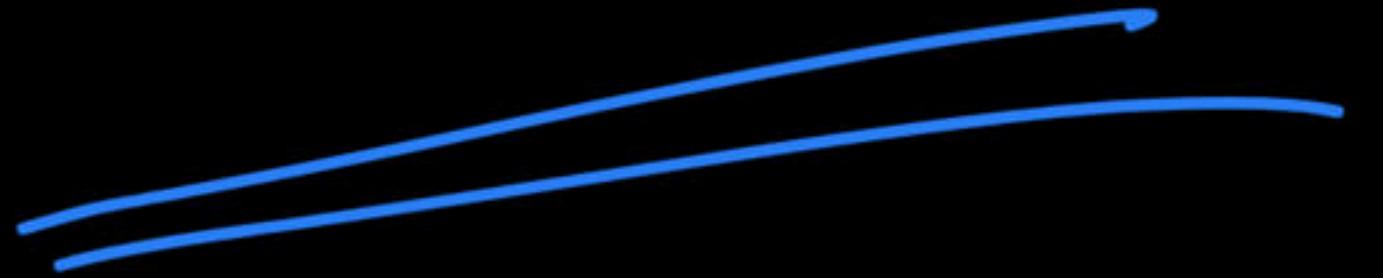
bf(".f.d-l.d-l.d", n13, n14, n15);  
x (n54)

++q, a = a - 1, q++





Doubt ?



▲ 1 • Asked by Jyotirmoy

sir ek baar bitwise operator even number ka code run karenge?



# THANK YOU!

Here's to a cracking journey ahead!