

Conditionals• If statement

Syntax . if (age \geq 18) ^{C1}
 {
 cout << "You can vote"; ^{S1}
 }
 cout << "You can't vote"; ^{S2}

If C1 is true then op.
 You can vote
 You can't vote

If C1 is false then op
 You can't vote

• If - Else statement

```
if (age  $\geq$  18)
{
    cout << "You can vote";
}
else
{
    cout << "You can't vote";
}
```


- Nested If else

Syntax-

```

if (marks >= 90) {
    cout << "A ";
}
else {
    if (marks >= 80) {
        cout << "B ";
    }
    else {
        if (marks >= 60) {
            cout << "C ";
        }
        else {
            cout << "D ";
        }
    }
}
}
}
}

```

- If else ladder

```

if (marks >= 90) {
    cout << "A ";
}
else if (marks >= 80) {
    cout << "B ";
}
else if (marks >= 60) {
    cout << "C ";
}
else if (marks >= 40) {
    cout << "D ";
}
else {
    cout << "F ";
}

```


Code 1

```
int main() {
    int bronum;
    cout << "Enter no. of bros" << endl;
    cin >> bronum;
    if (bronum == 0)
    {
        cout << "Bat ban jaegi";
    }
    else
    {
        cout << "Bat Nahin banegi";
    }
}
```

Loops

• for loop

eg. name → 5 times print karo.

```
for( int i=0; i<5; i=i+1 )
{
    cout << "Ding";
}
```

Initialization Condition Updation

eg. for(int i=0; i<3; i=i+1)

```
{
    cout << i;
    cout << endl;
}
```

Output ⇒

0
1
2

eg. `for (int i=5; i>0; i=i-1) {
 cout << i << endl;
}`

Output

5
4
3
2
1

eg. `for (int i=1; i<=10; i=i+1) {
 cout << 2*i << endl;
}`

Output

2
4
6
8
10
12
14
16
18
20

eg. `for (int i=0; i<=5; i=i+2) {
 cout << i << endl;
}`

Output

0
2
4

eg. for (int i=1; i<=5; i=i+2) {
 cout << i << endl
}

Output.

1
3
5

eg. for (int i=1; i<10; i=i*2) {
 cout << i << endl
}

Output.

1
2
4
8

eg. for (int i=100; i>0; i=i/2) {
 cout << i << endl
}

Output

100
50
25
12
6
3
1

eg.

```
for (int i=0; (i<5 || i<=10); i=i+1) {
    cout << i << endl;
}
```

Output

5
6
7
8
9
10

eg.

```
int n;
if (cin >> n)
```

```
{
    cout << "Babbar";
}
```

eg.

```
int n;
if (cout << "Babbar")
{
    cout << "Love";
}
```


Patterns

(1) →

	col 0	col 1	col 2	col 3	col 4
row 0	★	★	★	★	★
row 1	★	★	★	★	★
row 2	★	★	★	★	★

(Solid Rectangle)

Observations:

Total Rows = 3

Total Columns = 5

col 0 → 3 ★

col 1 → 3 ★

col 2 → 3 ★

col 3 → 3 ★

col 4 → 3 ★

Nested loop

```

graph TD
    NL[Nested loop] --> OL[Outer loop]
    NL --> IL[Inner loop]
    OL --> R[Rows]
    IL --> C[Columns]
  
```

Solⁿ

```

for (int row = 0; row < 3; row = row + 1)
{
    for (int col = 0; col < 5; col = col + 1)
    {
        cout << "★";
    }
    cout << endl;
}
  
```

(2)

★	★	★	★
★	★	★	★
★	★	★	★
★	★	★	★

```

for (int row = 0; row < 4; row++)
{
    for (int col = 0; col < 4; col++)
    {
        cout << "★ ";
    }
    cout << endl;
}
  
```


Hollow Rectangle

```
★ ★ ★ ★ ★
★           ★
★ ★ ★ ★ ★
```

```
for (int i=0; i<3; i++)
{
    if (row==0 || row==2) {
        for (int j=0; j<5; j++) {
            cout << "★ ";
        }
    }
    else {
        cout << "★";
        for (int i=0; i<3; i++) {
            cout << " ";
        }
        cout << "★";
    }
    cout << endl;
}
```


(3) Half Pyramid

row 0 ★
 row 1 ★ ★
 row 2 ★ ★ ★
 row 3 ★ ★ ★ ★
 row 4 ★ ★ ★ ★ ★
 row 5 ★ ★ ★ ★ ★ ★

row 0 → 1 ★
 row 1 → 2 ★
 row 2 → 3 ★
 row 3 → 4 ★
 row 4 → 5 ★
 row 5 → 6 ★

```
int n;  
cin >> n;  
for (int row = 0; row < n; row++)  
{  
    for (int col = 0; col < row + 1; col++)  
    {  
        cout << "★ ";  
    }  
    cout << endl;  
}
```

(4)
 row 0 ★ ★ ★ ★ ★ ★
 row 1 ★ ★ ★ ★ ★
 row 2 ★ ★ ★ ★
 row 3 ★ ★ ★
 row 4 ★ ★
 row 5 ★

int n;

cin >> n;

```
for (int row = 0; row < n; row++)
```

```
{
```

```
    for (int col = 0; col < n - row; col++)
```

```
    {
```

```
        cout << "★ ";
```

```
    }
```

```
    cout << endl;
```

```
}
```

row 0 → 6
 row 1 → 5
 row 2 → 4
 row 3 → 3
 row 4 → 2
 row 5 → 1

5) Numeric half pyramid
 $n=5$

row 0	1				
row 1	1	2			
row 2	1	2	3		
row 3	1	2	3	4	
row 4	1	2	3	4	5

col 0 col 1 col 2 col 3 col 4

```
for (int row = 0; row < n; row++)
{
    for (int col = 0; col < row+1 n; col++)
    {
        cout << col+1;
    }
    cout << endl;
}
```

6) Inverted half pyramid

	col 0	col 1	col 2	col 3	col 4
row 0	1	2	3	4	5
row 1	1	2	3	4	
row 2	1	2	3		
row 3	1	2			
row 4	1				

```
for (int row = 0; row < n; row++)
{
    for (int col = 0; col < n-row; col++)
    {
        cout << col+1;
    }
    cout << endl;
}
```