

Conditionals & loops

Conditionals

```
if (count == 0) {
    cout << "Go Ahead" << endl;
```

Syntax

Task \Rightarrow

```
if (balance > 10) {
    cout << "Maggie" << endl;
} else {
    cout << "Kukure" << endl;
```

```
if (side == 3) {
    cout << "Triangle";
```

```
} else {
    cout << "Not a Triangle";
```

Note: If there is only one line inside if else we can remove curly bracket, but writing curly bracket is a good practice.

Homework → code all on scratch paper
H.W of Flowcharts

Date _____
Page 28

If +ve, -ve, 0.

```
if (n < 0) {  
    cout << "-ve" ;  
}  
else if (n > 0) {  
    cout << "+ve" ;  
}  
else {  
    cout << "0" ;  
}
```

Used ⇒ else if Ladder

Even / odd

```
if (n % 2 == 0) {  
    cout << "even" ;  
}  
else {  
    cout << "odd" ;  
}
```

LOOPS

Repetition के लिये loops आएं कार्ते हैं।

1. For
2. while
3. do-while
4. for-each

Syntax of For Loop

```
for ( initialization; condn ; updation )
    {
        || Logic
    }
```

Outer loop + Inner loop

```
for ( int i=0; i<3; i=i+1 ) {
    cout << "Outer Loop" << i << endl;
    for ( int j=0; j<3; j=j+1 ) {
        cout << "Inner loop" << j << endl;
    }
}
```

For each outer loop, inner loop will run fully.

Tasks

1.

```
for ( i=0; i<11; i++ ) {
    cout << " Pratham " << endl;
}
```

2.

```
for ( i=1; i<11; i++ ) {
    cout << 19 * i << endl;
}
```

3.

```
for ( i=1; i<101; i++ ) {
    if ( i%2 == 0 ) {
        cout << " Even no is " << i << endl;
    }
}
```

```
if ( i%2 == 0 ) {
```

```
    cout << " Even no is " << i << endl;
}
```

```
}
```

Pattern Matching

Square Pattern

	0	1	2	3
0	*	*	*	*
1	*	*	*	*
2	*	*	*	*
3	*	*	*	*

Rules for solving problems

1. Find no. of rows
2. Write down for each row

Code:-

```
    //outer loop → rows
    for (int i=0; i<4; i=i+1) {
        // Print 4 stars
        for (int j=0; j<4; j=j+1) {
            cout << "* ";
        }
        cout << endl;
    }
```

Rectangle

```
* * * * *  
* * * * *  
* * * * *
```

1 Row → 3

2 5 stars in each row.

Code:-

```
// Outer loop → rows  
for (int i=0; i<3; i++) {  
    // For each row, print 5 stars  
    // inner loop → print 5 stars  
    for (int j=0; j<5; j++) {  
        cout << "* ";  
    }  
    cout << endl;  
}
```

Hollow Rectangle

* * * * *
* * * * *
* * * * *
* * * * *
* * * * *

① Rows → 5

② $r_0 \rightarrow$ 5 stars

$r_1 \quad \} \quad 1*$, 3 spaces, 1*

$r_2 \quad \} \quad 1*$, 3 spaces, 1*

$r_3 \quad \} \quad 1*$, 3 spaces, 1*

$r_4 \rightarrow$ 5 stars

Code :-

```
for c int i=0 ; i<5 ; i=i+1) {
```

```
    for c int j=0 ; j<5 ; j=j+1) {
```

```
        if (i==0 || i==4) {
```

```
            cout << "* ";
```

```
}
```

```
        else {
```

```
            if (j==0 || j==4) {
```

```
                cout << "* ";
```

```
}
```

```
            else {
```

```
                cout << " ";
```

```
}
```

```
} }
```

```
cout << endl;
```

Half Pyramid

```
*  
* *  
* * *  
* * * *  
* * * *
```

(1) Rows \rightarrow 5

(2) $r_0 \rightarrow 1$

$r_1 \rightarrow 2$

$r_2 \rightarrow 3$

$r_3 \rightarrow 4$

$r_4 \rightarrow 5$

Inner loop \rightarrow row + 1

Code :

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

Inverted Half Pyramid

```
* * * * *
* * * *
* * *
* *
*
```

(1) Rows \rightarrow 5

(2) $r_0 \rightarrow 5$

$r_1 \rightarrow 4$

$r_2 \rightarrow 3$

$r_3 \rightarrow 2$

$r_4 \rightarrow 1$

Inner loop \rightarrow Row - RowNo

Code:-

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

Numeric Half Pyramid

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

```

(1) 5 st Rows

(2) $r_0 \rightarrow 1$ $r_1 \rightarrow 1 2$ $r_2 \rightarrow 1 2 3$ $r_3 \rightarrow 1 2 3 4$ $r_4 \rightarrow 1 2 3 4 5$ inner loop $\rightarrow row + 1$ Print $\rightarrow col + 1$

Code:-

```

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

```

Inverted Numeric, Half Pyramid.

```

1 2 3 4 5
1 2 3 4
1 2 3
1 2
1

```

(1) 5 Rows

(2) $r_0 \rightarrow 1 2 3 4 5$ (5)

$r_1 \rightarrow 1 2 3 4$ (4)

$r_2 \rightarrow 1 2 3$ (3)

$r_3 \rightarrow 1 2$ (2)

$r_4 \rightarrow 1$ (1)

Inner loop \rightarrow Trow - Row

Print \rightarrow col+1

Code:

```

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

```