

Loops

→ Repeat something / part of your code.

→ Count Money

→ Try until win

→ Counter-Controlled

- Depends on value of var aka counter

- increment/decrement per iteration

- e.g. 3, 2, 1, 0, Boom!

→ Sentinel-Controlled / Conditional

- something happens in loop body indicating loop should exit.

- e.g. tank full, close the tap

1) for loop.

```
for (int i=0; i<10; i++)
```

initialization

test

condition

increment expression

For loop multiple expressions

```
for(int i=0, j=5; j<10; i++, j++)
```

- expects only single statement in body.

- valid or not

① `for(int i=0; i<n; i++)`

`cout<<"of course valid"<<endl;`

② `for(int i=0; i<n; i++);`

// Ahh, why your tricking us!

- Block { }

use to group multiple statements

```
for(int i=0; i<n; i++) {
```

`cout<<"now i understand these`

`curly braces"<<endl;`

`cout<<"i will not forget
this now"<<endl;`

=> Scope;


```
for (int j=0; j<10; j++) {
```

```
    int k=0;
```

```
    cout << "I am k = " << k << endl; j
```

```
}
```

```
    cout << "I was k = " << k << endl; }
```

=> output?

```
for (int j=0; j<10; j++)
```

```
    cout << "you are making mistake for  
the " << j << " the time " << endl;
```

```
    cout << "Last time i made mistake  
was , when j = " << j << endl;
```

optional expressions

```
int j=0;
```

```
for ( ; j<10; )
```

```
    j++;
```

```
// valid
```

=> working, initialization runs

for the first time only, the condition
is checked, then body executes, then
increment/decrement, the condition
the body and so on —

= While Loops

- if you don't know how many times you want to do something before you start the loop!

=> while (something == true)
statement;

e.g.

```
int j = 0;
while (j < 2) {
    cout << "chal jata hn bhai" << endl;
    j++;
}
```

Q - write a program that tells how many times we can divide this number by 2 to get down to 1?

DO while loops-

- executes at least one time then check condition
do {

} while(—);

=> OR

do

cout << "mein tum print ho
jaunga, tera kya hoga kaaliya?" <<
endl;

while (kaaliya == waiting);

= Break Statement

- Immediate exit from any loop

= Continue Statement

- program continues goes to end of loop body for next iteration only

Nested loops.

- cricket (20 over match)
each over 6 balls.
- patterns
- Matrices
-

=> infinite loop.

- never ends

e.g. `for (int i=0; i<10; i--)`

`cout << "bar ke ja bhai <<`

Q- Sum of odd numbers from
1 to 10, without if condition!

Output?

```
for (int j=0; j<10; j++) {
```

```
    if (j%2 == 0) continue;
```

```
    cout << j << endl;
```

```
}
```

```

int i=1;
while ( i < 5 ) {
    cout << i << " ";
    i++;
    if (i == 3) break;
}

```

Q - Reverse a number?

```

i = 0;
while ( i != 9 )
    i += 2;
cout << " myhy bhi mara do ya" << endl;

```