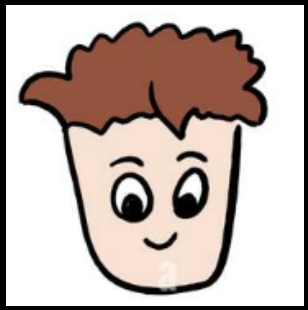
LOOPS

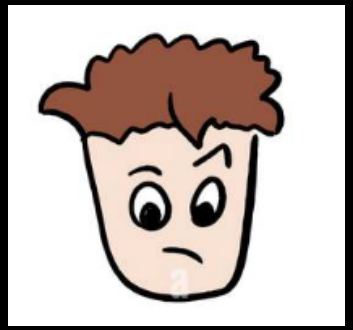
PRINT FROM 1 TO 5

```cpp
#include<iostream>
using namespace std;

int main()
{
    cout << 1 << endl;
    cout << 2 << endl;
    cout << 3 << endl;
    cout << 4 << endl;
    cout << 5 << endl;
}
```



PRINT FROM 1 TO 10

```cpp
int main()
{
    cout << 1 << endl;
    cout << 2 << endl;
    cout << 3 << endl;
    cout << 4 << endl;
    cout << 5 << endl;
    cout << 6 << endl;
    cout << 7 << endl;
    cout << 8 << endl;
    cout << 9 << endl;
    cout << 10 << endl;
}
```



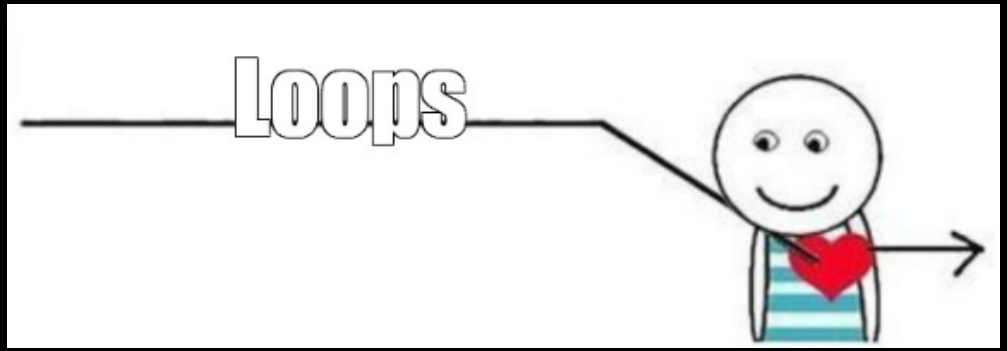
PRINT FROM 1 TO 1000

```cpp
int main()
{
    cout << 1 << endl;
    cout << 2 << endl;
    cout << 3 << endl;
    cout << 4 << endl;
    cout << 5 << endl;
    cout << 6 << endl;
    cout << 7 << endl;
    cout << 8 << endl;
    cout << 9 << endl;
    cout << 10 << endl;
    .
    .
    .
    .
    .
```

How can we repeat work without writing the same code again and again?

LOOPS

When you want to
repeat an action
again and again
till a certain condition,
we can use loops.



TYPE OF LOOPS

1) **While** loop

2) **For** loop

3) **Do-while** loop

WHILE LOOP

```
initialization;

while(condition)
{
    // body
    update;
}
```

PRINT FROM 1 TO 10

```
int i = 1;
while(i <= 10)
{
    cout << i << endl;
    i++;
}
```

False

1 2 3 4 5 6 7 8 9 10

11 <= 10 No

i

1 2 3 4 5 6 7 8 9 10 11

1 <= 10 YES

2 <= 10 YES

3 <= 10 YES

4 <= 10 YES

5 <= 10 YES

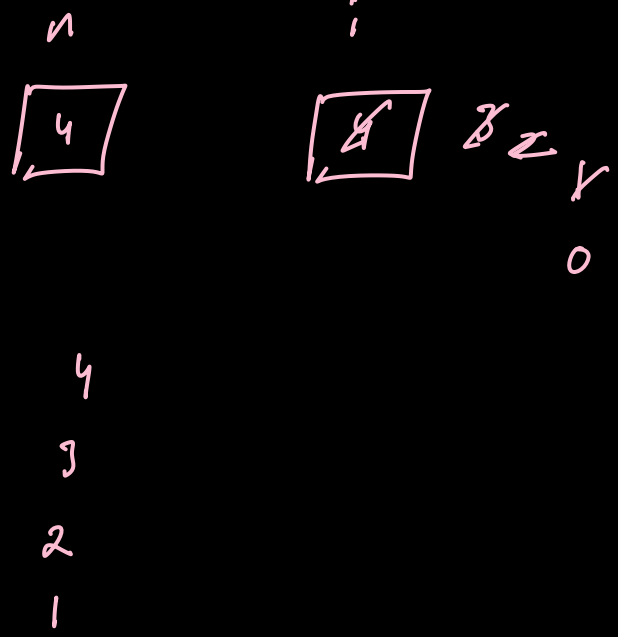
PRINT 1 TO N

```cpp
int main()
{
    int n;
    cin >> n;

    int i = 1;
    while(i <= n)
    {
        cout << i << endl;
        i++;
    }
}
```

```cpp
int i = n;
while( i >= 1)
{
    cout << i << endl;
    i--;
}
```

PRINT N TO 1

```cpp
int main()
{
    int n;
    cin >> n;

    int i = n;
    while(i >= 1)
    {
        cout << i << endl;
        i--;
    }
}
```



PRINT NUMBERS FROM L TO R

```cpp
int main()
{
    int l, r;
    cin >> l >> r;

    int i = l;
    while(i <= r)
    {
        cout << i << endl;
        i++;
    }
}
```

PRINT ALL EVEN NUMBERS FROM 1 TO N

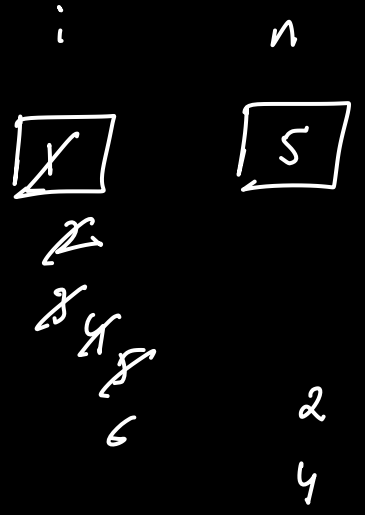
n = 5

2
4

n = 6

2
4
6

```
int n;
cin >> n;

int i = 1;
while( i <= n)
{
    if( i % 2 == 0)
    {
        cout << i << endl;
    }
    i++;
}
```



PRINT ALL EVEN NUMBERS FROM 1 TO N

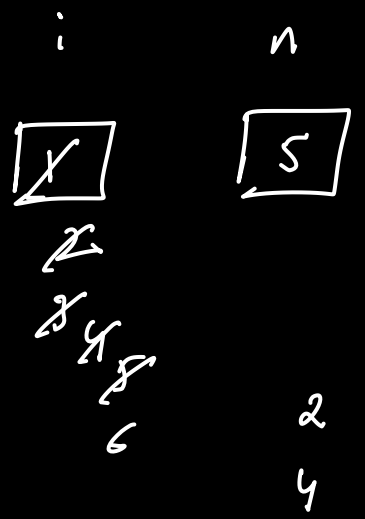
n = 5

2
4

n = 6

2
4
6

```
int n;
cin >> n;

int i = 2;
while( i <= n)
{
    cout << i << endl;

    i += 2;
}
```



PRINT ALL UPPERCASE ALPHABETS (A - Z)

```
char ch = 'A';

while( ch <= 'Z')
{
        cout << ch << endl;

        ch++;
}
```

ASCII Values

'A' → 65
'B' → 66
'C' → 67
⋮

'a' → 97
'b' → 98
'c' → 99
⋮

PRINT MULTIPLICATION TABLE

n = 5	n = 6
5 x 1 = 5	6 x 1 = 6
5 x 2 = 10	6 x 2 = 12
5 x 3 = 15	6 x 3 = 15
5 x 4 = 20	6 x 4 = 24
5 x 5 = 25	6 x 5 = 30
5 x 6 = 30	6 x 6 = 36
5 x 7 = 35	6 x 7 = 42
5 x 8 = 40	6 x 8 = 48
5 x 9 = 45	6 x 9 = 54
5 x 10 = 50	6 x 10 = 60

```
int i=1;
while(i<=10)
{
    cout << n << " x " << i << " = " << (n*i) << endl;
    i++;
}
```

PRINT NUMBER IN REVERSE

n = 512

215

n = 1927

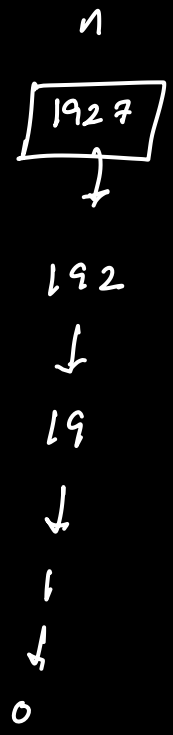
7291

n = 3429

9243

```
int n;
cin >> n;

while ( n != 0 )
{
    cout << n % 10;
    n = n / 10;
}
```

n = 1950



DIGITS SUM

Sum
0

n = 512 ⇒ 5 + 1 + 2 = 8

8

n = 1927 ⇒ 1 + 9 + 2 + 7 = 19

19

n = 3429 ⇒ 3 + 4 + 2 + 9 = 18

18

```
int sum = 0;

int n;
cin >> n;

while ( n != 0 )
{
    sum += n % 10;

    n = n / 10;
}

cout << sum << endl;
```

DSA Contest

28th Jan
Wed

8-10 PM

REVERSE AND STORE IN A VARIABLE

n = 512

ans = 215

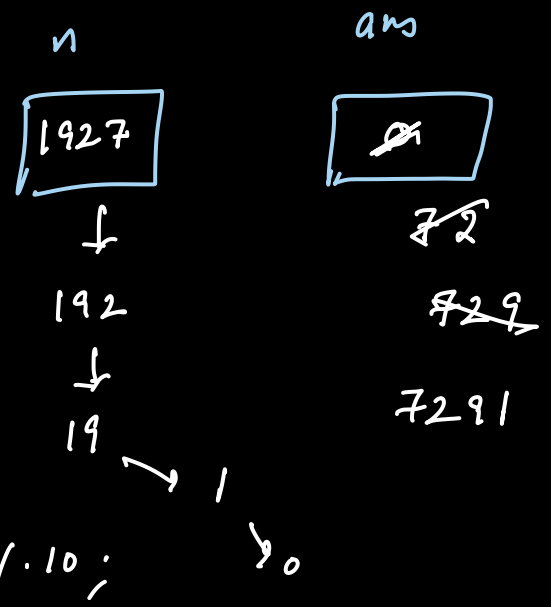
n = 1927

ans = 7291

n = 3429

ans = 9243

```
int ans = 0;

int n;
cin >> n;

while ( n != 0 )
{
    ans = (ans * 10) + n % 10;
    n = n / 10;
}

cout << ans << endl;
```



PALINDROME

n = 12321

YES rev = 12321

n = 1927

NO rev = 7291

n = 1

YES rev = 1

```
int rev = 0;

int n;
cin >> n;
```

→ `int temp = n;`

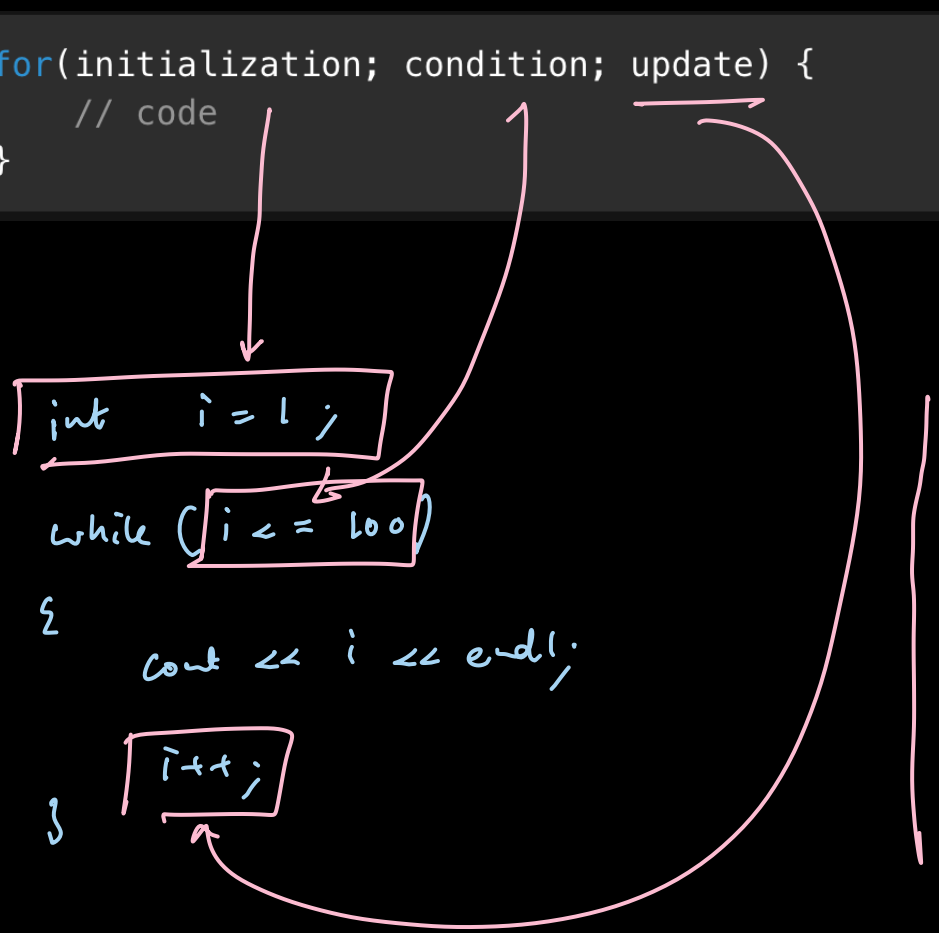
```
while ( n != 0 )
{
    rev = (rev * 10) + n % 10;

    n = n / 10;
}
```

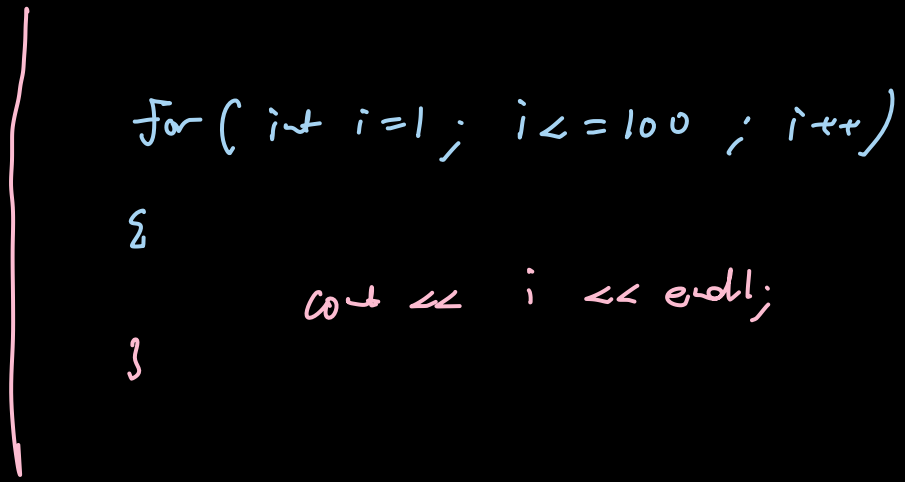
→ what will be the value of N ? 0

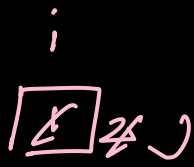
```
if ( rev == ) → temp
{
    cout << "YES";
}
else
{
```

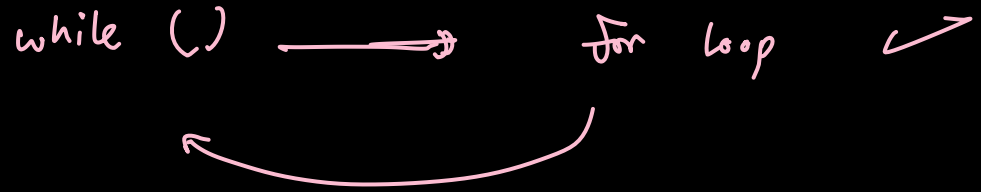
FOR LOOP

```
for(initialization; condition; update) {
    // code
}
```








while ( )
for loop