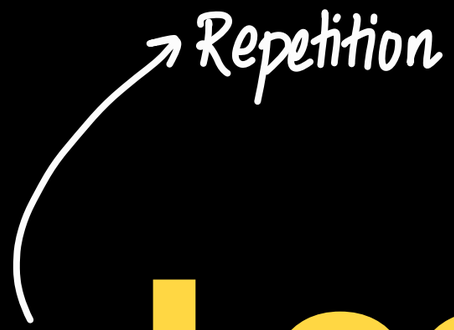
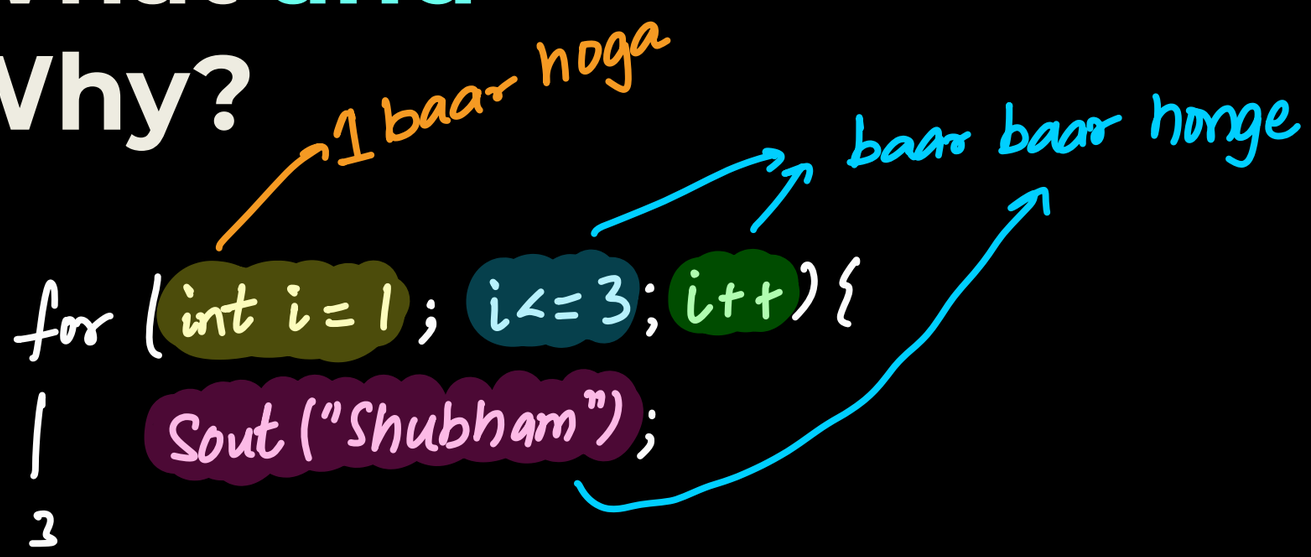


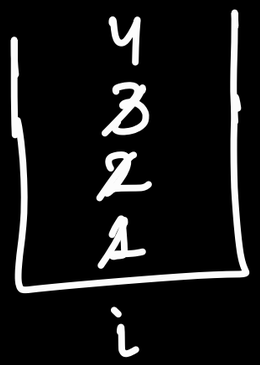
Loops

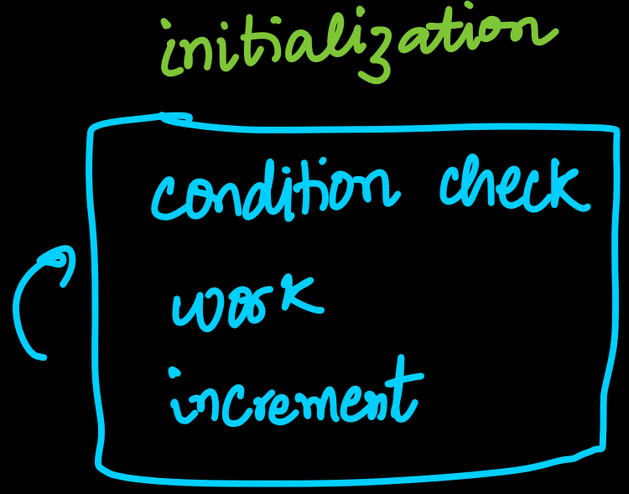
for, while, do while

Contents

What and Why?







Output

- Shubham
- Shubham
- Shubham
-

For Loop

Q. Print numbers from 1 to 10.

H.W.

Ques: Print yashika ‘n’ times. Take ‘n’ input from user

How For Loop works : the various parameters

Ques: Print numbers from 1 to 100

Ques: Print all even numbers from 1 to 100

2, 4, 6, 8 . . . . . 98, 100

HW: Print all odd numbers divisible by 3 from 1 to 100

Ques: Print the table of ~~10~~ 17

17 34 51 68 85 102 . . . 170

Ques: Print numbers from ‘n’ to 1.

Decreasing Loop

```
for(int i=n ; i>=1; i--){
|   sout(i)
3
```

Ques: Display this AP - 2,5,8,11.. upto ‘n’ terms

```
for( int i = 2; i<=3n-1 ; i+=3){
    sout(i);
}
```

$a_n = a + (n-1)d$

$2 + (n-1) \cdot 3$

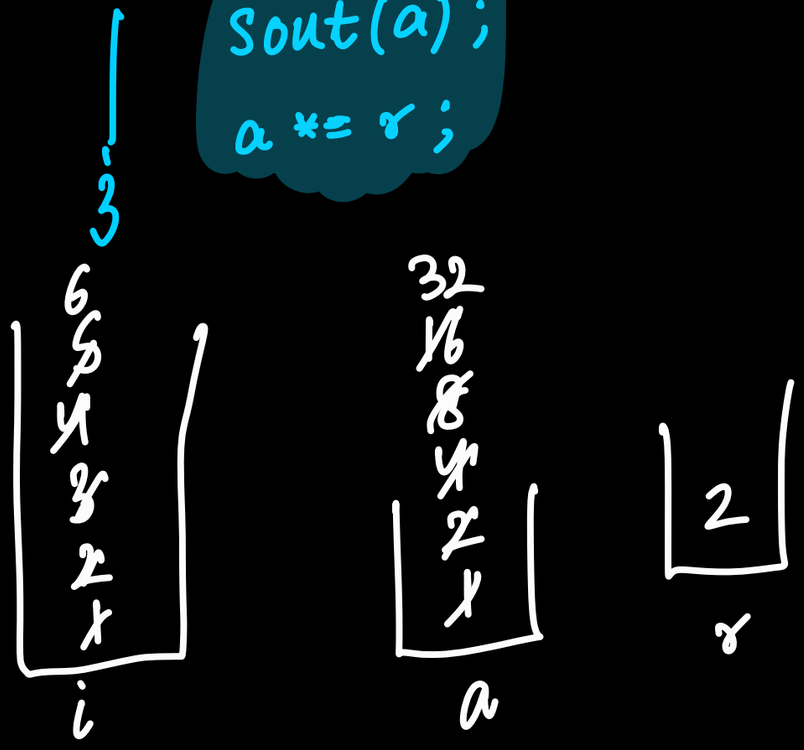
$2 + 3n - 3$

$\boxed{3n-1}$

Ques: Display this GP - 1,2,4,8.. upto ‘n’ terms

n = 5

```
int a = 1, r = 2;
for(int i=1; i<=n; i++){
    Sout(a);
    a *= r;
```



Output

1
2
4
8
16

HW: Print this series - 99,95,91,87,.. upto all terms which are positive

Method -1 Using 'i' condition pata ho

Method-2 Using 'a' → no. of terms

Ques: Print all alphabets with their corresponding ASCII values.

A 65

B 66

C 67

.

.

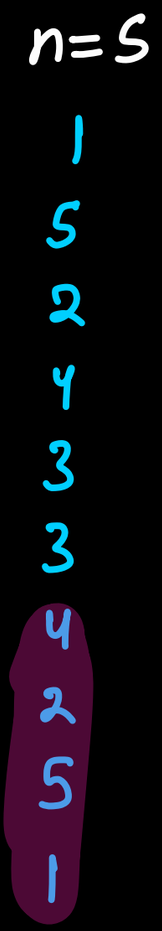
.

.

Z 90

HW: Take ‘n’ as input from user and print the following sequence..

1
n
2
n-1
3
n-2
...



Break & continue

is used to skip iterations.

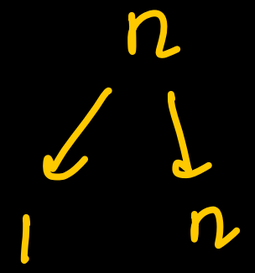
```
for(init; condition; inc/dec){
    if(---) break;
}
```

```
for(          ){
}
```

loop → iterations

Ques: WAP to check if a given number is prime or not.

Q// WAP to print if number is composite or not.



2 to n-1 tak koi factor mile 'n' ka to 'n' composite ho jayega

60 → 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

'i' is factor of 'n' if n%i == 0

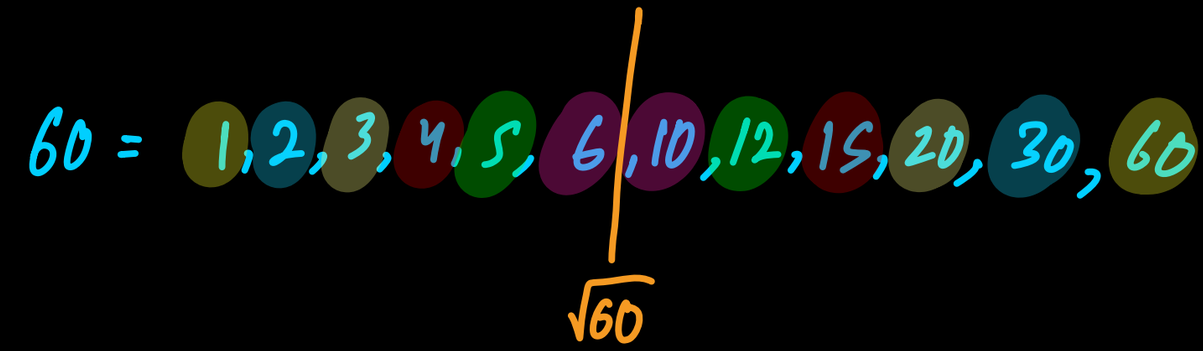
Ques: WAP to check if a given number is prime or not.

4 → 1, 2, 4

9 → 1, 3, 9

25 → 1, 5, 25

49 → 1, 7, 49



If 'i' is a factor of 'n' then

'n/i' is also a factor of 'n'

Ques: Print all even numbers from 1 to 100 ' Continue Statement '

H.W. Take a number input & print all of its factors.

```
for(int i=1 ; i<=√n ; i++){
    if(n%i==0){
        sout(i);
        sout(n/i);
    }
}
```

While Loop

Usecase : Generally used when conditions are more than one.
Jab bhi iterations nahi pata ho ki kitni hai

```
for(int i=1; i<=10; i++){
|   sout(i);
}
```

```
int i=1;
while(i<=10){
|   sout(i);
|   i++;
}
```

initialization

condition
body
increment

Do-While Loop

Infinite Loop

Ques: Count digits of a number

n = 5 6 1 3 2

↓

5 6 1 3

↓

5 6 1

↓

5 6

↓

5

↓

0

n = 991

↓

99

↓

9

↓

0

```
int n = sc.nextInt();
int count = 0;
while (n != 0){
    n /= 10
    count++;
}
3
```

Ques: Print sum of digits of a number

n = 5 6 1 4 2

Sum = 5 + 6 + 1 + 4 + 2

= 18

n = 999

sum = 9 + 9 + 9 = 27

Hint no. 1 .

5 + 6 + 1 + 4 + 2 = 2 + 4 + 1 + 6 + 5

Hint no. 2

n % 10

Ques: Print sum of digits of a number

n = 5 6 1 4 2 → 5 6 1 4 → 5 6 1 → 5 6 → 0

Sum = 0 2 6 7 13 18

n%10 gives the last digit of any number 'n'

(-a) % b = -(a % b)

```
while (n != 0){
|   sum += n%10
|   n /= 10
}
```

~~Ques: Sum of digits of a number~~

int -2^{31} to $2^{31}-1$

long -2^{63} to $2^{63}-1$

Ques: Reverse of a number

n = 1 2 8 6

r = 6 8 2 1

6000 + 800 + 20 + 1

Steps : 6 → 60 → 68 → 680 → 682 → 6820 → 6821

H.W. Print sum of number & its reverse.

Ques: Reverse of a number

n = 1 2 8 6 128 12 1 0

r = 0 0 6 60 68 680 682 6820 6821

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

Ques: Factorial of a number

Bhot hi simple.

$\lfloor 5$ or $5! = 5 \times 4 \times 3 \times 2 \times 1$

$\lfloor 8$ or $8! = 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$

$\lfloor n = 1 \times 2 \times 3 \times \ldots n$

Ques: ‘a’ raise to the power ‘b’

$a^b = (a \times a \times a \times a \cdots)$

b times

$2^6 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

p = 1

```
for(      ){
| p *=2
}
```

THANKYOU

Cuties