

(Q) Factorial of a number

```
int fact(int n){  
    int factorial=1;  
    for(int i=2;i<=n;i++){  
        factorial*=i;  
    }  
    return factorial;  
}
```

(Q) Reverse a Number

```
int n;  
cin>>n;  
  
int reverse=0;  
while(n>0){  
    int lastdigit= n%10;  
    reverse = reverse*10 + lastdigit;  
    n=n/10;  
}  
  
cout<<reverse<<endl;
```

(Q) GCD of two numbers

Now we know

$$42 - 24 = 18$$

$$24 - 18 = 6$$

$$18 - 6 = 12$$

$$12 - 6 = 6$$

$$6 - 6 = 0$$

stop

$$\frac{a}{b} \quad \downarrow$$

$$42 \% 24 = 18$$

$$24 \% 18 = 6$$

$$18 \% 6 = 0$$

stop

GCD
of two
numbers.
a and b

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

```
int gcd(int a, int b){  
    while(b!=0){  
        int rem=a%b;  
        a=b;  
        b=rem;  
    }  
    return a;
```

(Q) Check prime number OR not

```
bool flag=0;
```

```
for(int i=2;i<=sqrt(n);i++){  
    if(n%i==0){  
        cout<<"Non-prime"<<endl;  
        flag=1;  
        break;  
    }  
}
```

```
if(flag==0){  
    cout<<"prime"<<endl;
```

→ to check if a given no. is prime or not you need not check upto n , instead we need to check only upto \sqrt{n} , if no number until \sqrt{n} is a factor of n then we won't get any factor of n from \sqrt{n} to $(n-1)$ too. → 1 not included and \sqrt{n} included

(Q) Exponentiation (a^b)(Q) Binary Exponentiation ($(a^b)^2$)

(Q) Trailing zeroes in Factorial.

Example:- Input :- 5
Output :- 2 → cause, $5!$ is 120
and $\frac{1}{5}$ zero is present at the end.

Now you might think factorial nibal length, like bad and mein no. of zeroes count kar length. Simple, but but but.

$120!$ ka kaise nibaloge \Rightarrow 100 digit ka no. hoga has 120, aur isko long long main bhi store karna kya sake

∴ kuchh aur sochha yahega.
 $12! = 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$

ab end mein zeroes kaise aayegaa??
takhe baron ya 5x1 ke karon, so basically hame kitne 5x1 bar sake hain nibala

so ab dikh raha hai ki no. of zeroes >> no. of 5s
so no. of 5s nibal liya toh apna kaam ho jayega.

1 to 5 → one 5
1 to 10 → two 5s
1 to 15 → three 5s
1 to 20 → four 5s
1 to 25 → five 5s
cause $5 \times 5 = 25$

$$\therefore \text{no. of trailing zeroes in } n! = \left\lfloor \frac{n}{5} \right\rfloor + \left\lfloor \frac{n}{25} \right\rfloor + \dots$$

```
// Given n
int res=0;

for(int i=5; i<=n; i=(i*5)){
    res = res + n/i;
}
```

```
return res;
```

→ then code

→ convert decimal to binary.

(Q) Find n th element in Fibonacci Sequence.

```
void fib(int n){  
    int t1=0;  
    int t2=1;  
    int nextTerm;  
    for(int i=1;i<=n;i++){  
        cout<<t1<<endl;  
        nextTerm=t1+t2;  
        t1=t2;  
        t2=nextTerm;  
    }  
    return;
```