**1] Prime Factors:**

#include <bits/stdc++.h>

#include <iostream>

using namespace std;

bool checkPrime(int n)

{

int cnt = 0;

for(int i = 1; i <= sqrt(n); i++)

{

if(n % i == 0)

{

cnt++;

if(n / i != i)

{

cnt++;

}

}

}

if(cnt == 2)return true;

else return false;

}

vector<int> getPrimeFactors(int n)

{

vector<int> v;

for(int i = 2; i <= n; i++)

{

if(n % i == 0)

{

if(checkPrime(i))

{

v.push\_back(i);

}

}

}

return v;

}

int main()

{

int n;

cout << "Enter the number: ";

cin >> n;

vector<int> primeFactors = getPrimeFactors(n);

cout << "Prime Factors for " << n << ": ";

for(auto i: primeFactors)cout << i << " ";

cout << endl;

}

**2] Extended GCD:**

#include<bits/stdc++.h>

using namespace std;

int main()

{

int a, b;

cout << "Enter the numbers a & b: ";

cin >> a >> b;

int q = 0, r = 0, s = 0, t = 0, r1 = a, r2 = b, s1 = 1, s2 = 0, t1 = 0, t2 = 1;

while(r2 > 0)

{

q = r1 / r2;

r = r1 % r2;

s = s1 - (s2 \* q);

t = t1 - (t2 \* q);

r1 = r2;

r2 = r;

s1 = s2;

s2 = s;

t1 = t2;

t2 = t;

}

cout << "gcd: " << r1 << " s: " << s1 << " t: " << t1 << endl;

return 0;

}