

## GCD (Prime Factorization)

### Code

```
#include<bits/stdc++.h>
using namespace std;

void Intersection(int arr1[], int arr2[], int m, int n)
{
    int mult=1;
    int i = 0, j = 0;
    while (i < m && j < n)
    {
        if (arr1[i] < arr2[j])
            i++;
        else if (arr2[j] < arr1[i])
            j++;
        else
        {
            mult = mult * arr2[j];
            i++;
            j++;
        }
    }
    cout<<"The GCD is: "<<mult<<" (Prime Factorization) "<<endl;
}

int PrimeFactor(int a, int b)
{
    int MAX,len1,len2;
    int PF1[10];
    int PF2[10];
    int divisor1 = 2,divisor2 = 2,i=0,j=0,cPF1=0,cPF2=0;
    while(a>1)
    {
        while(a%divisor1 == 0)
        {
            cPF1++;

            PF1[i++] = divisor1;

            a = a / divisor1;
        }
        divisor1++;
    }
}
```

```

while(b>1)
{
    while(b%divisor2 == 0)
    {
        cPF2++;
        PF2[j++] = divisor2;

        b = b / divisor2;
    }
    divisor2++;
}

int m = sizeof(PF1)/sizeof(PF1[0]);
int n = sizeof(PF2)/sizeof(PF2[0]);

Intersection(PF1,PF2,m,n);
}

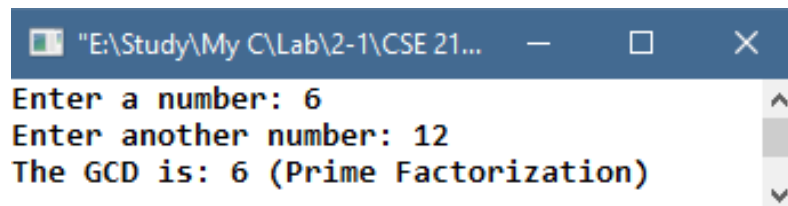
int main()
{
    int a,b,m;
    cout<<"Enter a number: ";
    cin>>a;
    cout<<"Enter another number: ";
    cin>>b;

    PrimeFactor(a,b);

    return 0;
}

```

## Output



```

"E:\Study\My C\Lab\2-1\CSE 21...
Enter a number: 6
Enter another number: 12
The GCD is: 6 (Prime Factorization)

```

## GCD (Euclidean Method)

### Code

```
#include<bits/stdc++.h>
using namespace std;

void GCDEuclid(int a, int b)
{
    int r;
    int x = a;
    int y = b;

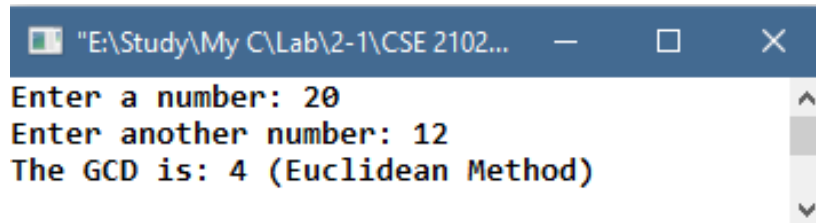
    while(y !=0)
    {
        r = x % y;
        x = y;
        y = r;
    }
    cout<<"The GCD is: "<<x<<" (Euclidean Method)"<<endl;
}

int main()
{
    int a,b;
    cout<<"Enter a number: ";
    cin>>a;
    cout<<"Enter another number: ";
    cin>>b;

    GCDEuclid(a,b);

    return 0;
}
```

### Output

A screenshot of a Windows command prompt window. The title bar shows the file path "E:\Study\My C\Lab\2-1\CSE 2102...". The window contains the following text: "Enter a number: 20", "Enter another number: 12", and "The GCD is: 4 (Euclidean Method)". The text is displayed in a monospaced font with some characters in red and blue. There are scroll bars on the right side of the window.

```
"E:\Study\My C\Lab\2-1\CSE 2102..."
Enter a number: 20
Enter another number: 12
The GCD is: 4 (Euclidean Method)
```

## **LCM (Prime Factorization)**

### **Code**

```
#include<bits/stdc++.h>
using namespace std;

void Union(int arr1[], int arr2[], int m, int n)
{
    int i = 0, j = 0, mult=1;
    while (i < m && j < n)
    {
        if (arr1[i] < arr2[j])
            mult = mult * arr1[i++];

        else if (arr2[j] < arr1[i])
            mult = mult * arr2[j++];

        else
        {
            mult = mult * arr2[j++];
            i++;
        }
    }

    while(i < m)
    {
        mult = mult * arr1[i++];
    }
    while(j < n)
    {
        mult = mult * arr2[j++];
    }
    cout<<"The LCM is: "<<mult<<" (Prime Factorization) "<<endl;
}

int PrimeFactor(int a, int b)
{
    int len1, len2;
    int PF1[3];
    int PF2[2];
    int divisor1 = 2, divisor2 = 2, i=0, j=0, cPF1=0, cPF2=0;
    while(a>1)
    {
        while(a%divisor1 == 0)
        {
```

```

        cPF1++;

        PF1[i++] = divisor1;

        a = a / divisor1;
    }
    divisor1++;
}

while(b>1)
{
    while(b%divisor2 == 0)
    {
        cPF2++;
        PF2[j++] = divisor2;

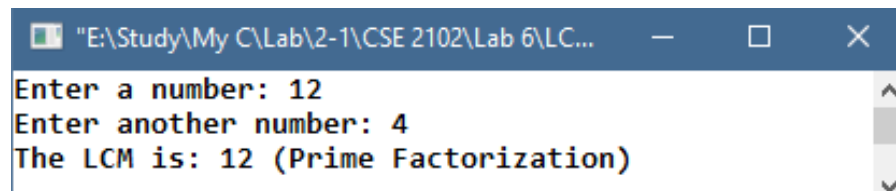
        b = b / divisor2;
    }
    divisor2++;
}
int m = sizeof(PF1)/sizeof(PF1[0]);
int n = sizeof(PF2)/sizeof(PF2[0]);
Union(PF1,PF2,m,n);
}

int main()
{
    int a,b,m;
    cout<<"Enter a number: ";
    cin>>a;
    cout<<"Enter another number: ";
    cin>>b;
    PrimeFactor(a,b);

    return 0;
}

```

## Output



```

E:\Study\My C\Lab\2-1\CSE 2102\Lab 6\LC...
Enter a number: 12
Enter another number: 4
The LCM is: 12 (Prime Factorization)

```