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Batch : B1
Topic : CNS Assignment 10

Aim : To calculate GCD using Euclidean Algorithm

Theory : In mathematics, the Euclidean algorithm, or Euclid's algorithm, is an efficient method for computing the greatest common divisor (GCD) of two integers (numbers), the largest number that divides them both without a remainder. It is named after the ancient Greek mathematician Euclid, who first described it in his Elements (c. 300 BC). It is an example of an algorithm, a step-by-step procedure for performing a calculation according to well-defined rules, and is one of the oldest algorithms in common use. It can be used to reduce fractions to their simplest form, and is a part of many other number-theoretic and cryptographic calculations.

Code :

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

int findGCD(int num1, int num2)
{
    if (num1 == 0)
        return num2;
    return findGCD(num2 % num1, num1);
}

int main()
{
    int num1, num2;
    cout << "\n Enter 1st number : ";
    cin >> num1;

    cout << "\n Enter 2nd number : ";
    cin >> num2;

    int gcd = findGCD(num1, num2);
    cout << "\n GCD is " << gcd << endl;

    return 0;
}
```

Output :

```
D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab\LA2>g++ Assignment_9_Eucladian.cpp
D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab\LA2>a.exe

Enter 1st number : 78

Enter 2nd number : 16

GCD is 2
```

```
D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab\LA2>a.exe

Enter 1st number : 34

Enter 2nd number : 17

GCD is 17

D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab\LA2>|
```