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Batch: B4  
Subject: CNS Lab  
PRN: 2020BTECS00068

**Aim: Find the GCD of two given number using Euclidean Algorithm :**

**Theory:**

The Euclidean Algorithm for finding  $\text{GCD}(A,B)$  is as follows: • If  $A = 0$  then  $\text{GCD}(A,B)=B$ , since the  $\text{GCD}(0,B)=B$ , and we can stop.

- If  $B = 0$  then  $\text{GCD}(A,B)=A$ , since the  $\text{GCD}(A,0)=A$ , and we can stop.
- Write  $A$  in quotient remainder form ( $A = B \cdot Q + R$ )
- Find  $\text{GCD}(B,R)$  using the Euclidean Algorithm since  $\text{GCD}(A,B) = \text{GCD}(B,R)$

**Code:**

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

int findGCD(int num1, int num2)
{
    cout << "Step\tNum1\tNum2\tQuotient\tRemainder" << endl;
    int step = 0;
    while (num2 != 0)
    {
        int quotient = num1 / num2;
        int remainder = num1 % num2;
        cout << step << "\t" << num1 << "\t" << num2 << "\t" << quotient <<
"\t" << remainder << endl;
        num1 = num2;
        num2 = remainder;
        step++;
    }
}
```

```

        return num1;
    }

int main()
{
    int num1, num2;
    cout << "Enter two numbers: ";
    cin >> num1 >> num2;

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

    return 0;
}

```

## Output:

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SEARCH TERMINAL OUTPUT
• PS E:\OS\Chinese Remainder_Thm> cd "e:\OS\Euclidean_PrimeFactors\" ; if ($?) { g++ Eucladian.cpp -o Eucladian } ; if ($?) { .\Eucladian }
Enter two numbers: 35 10
• Step Num1 Num2 Quotient Remainder
0 35 10 3 5
1 10 5 2 0
GCD is 5
PS E:\OS\Euclidean_PrimeFactors> cd "e:\OS\Euclidean_PrimeFactors\" ; if ($?) { g++ Eucladian.cpp -o Eucladian } ; if ($?) { .\Eucladian }
Enter two numbers: 35 15
• Step Num1 Num2 Quotient Remainder
0 35 15 2 5
1 15 5 3 0
GCD is 5
PS E:\OS\Euclidean_PrimeFactors>

```