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**Subject: Data Structures**

## **Practical – 5**

**Aim:** Program to GCD of two numbers using recursion also print number of recursive calls.

**Program:**

```
#include <stdio.h>
int gcd(int n1, int n2);
int count=0;
int main() {
    int num1 , num2;
    printf("Enter first natural numbers: ");
    scanf("%d", &num1);
    printf("Enter second natural numbers: ");
    scanf("%d", &num2);
    printf("GCD of %d and %d = %d", num1, num2, gcd(num1, num2));
    printf("\nNumber of recursive calls: %d", count);
    return 0;
}
int gcd(int n1, int n2){
    if(n2==0){
        return n1;
    }
    else{
        count++;
        return gcd(n2, n1%n2);
    }
}
```

**Output:**

Enter first natural numbers: 20

Enter second natural numbers: 75

GCD of 20 and 75 = 5

Number of recursive calls: 4

## Screenshot:

The screenshot displays the Visual Studio Code interface with a C program named `Practical_5.c` open. The program calculates the Greatest Common Divisor (GCD) of two numbers using a recursive function `gcd` and counts the number of recursive calls. The code is as follows:

```
1 #include <stdio.h>
2 int gcd(int n1, int n2);
3 int count=0;
4 int main() {
5     int num1, num2;
6     printf("Enter first natural numbers: ");
7     scanf("%d", &num1);
8     printf("Enter second natural numbers: ");
9     scanf("%d", &num2);
10    printf("GCD of %d and %d = %d", num1, num2, gcd(num1, num2));
11    printf("\nNumber of recursive calls: %d", count);
12    return 0;
13 }
14 int gcd(int n1, int n2){
15     if(n2==0){
16         return n1;
17     }
18     else{
19         count++;
20         return gcd(n2, n1%n2);
21     }
22 }
```

The terminal window shows the execution of the program. The user enters the numbers 20 and 75. The output is:

```
b> cd "c:\Users\Admin\Desktop\notes\Data Structure Lab\" ; i
f ($?) { gcc Practical_5.c -o Practical_5 } ; if ($?) { .\Pr
actical_5 }
Enter first natural numbers: 20
Enter second natural numbers: 75
GCD of 20 and 75 = 5
Number of recursive calls: 4
PS C:\Users\Admin\Desktop\notes\Data Structure Lab>
```

**Conclusion:** I have successfully completed practical 5.