4b. Write a C program that takes two numbers ‘x’ and ‘y’ as input and calculates the Greatest Common Divisor (GCD) of them and displays the result.

Description:

This program calculates the **Greatest Common Divisor (GCD)** of two numbers **x** and **y** using **Euclid’s Algorithm**. The **GCD** is the largest number that divides both **x** and **y** exactly.

Euclid’s Algorithm for GCD:

1. If $y = 0$, then **GCD(x, y) = x**.

2. Otherwise, replace x with y and y with $x \mod y$, and repeat the process until y becomes 0.

3. The final value of x is the **GCD**.

Example:

GCD of 48 and 18 is 6

Algorithm:

Step 1: Start

Step 2: Declare integer variables x and y.

Step 3: Prompt the user to enter two numbers (x and y).

Step 4: Read and store the values of x and y.

Step 5: Apply **Euclid’s Algorithm**:

• **Repeat until y becomes 0**:

• Compute remainder = x % y.

• Assign x = y.

• Assign y = remainder.

Step 6: When y becomes 0, x holds the **GCD**.

Step 7: Print the **GCD**.

Source Code:

```
#include <stdio.h>

int main() {
    int x, y, temp;

    // Taking input from the user
    printf("Enter two numbers: ");
    scanf("%d %d", &x, &y);

    // Calculating GCD using Euclidean algorithm
    while (y != 0) {
        temp
        = y;
        y = x
        % y;
        x =
        temp;
    }

    // Displaying the result
    printf("GCD is: %d\n", x);

    return 0;
   }
```

Sample Output:

```
Enter two numbers 13 39
GCD is : 13

Enter two numbers 6 9
GCD is : 3
```