

Student Name \_\_\_\_\_ Section \_\_\_\_\_

Instructor \_\_\_\_\_ Due Date \_\_\_\_\_

**PROJECT** **Loops - The Euclidean Algorithm ( GCD )** 100 points \_\_\_\_ *your score***Objective** To use looping techniques to illustrate the Euclidean Algorithm.**PROJECT DESCRIPTION**

Using a function call, determine the greatest common divisor using Euclid's Algorithm.

**Information About this Project**

Euclid's Algorithm for determining the greatest common denominator is as follows:

Begin with  $r$  representing the remainder of  $x$  divided by  $y$ If  $r$  is 0:The algorithm stops and  $y$  is the greatest common denominator

Otherwise:

 $x$  is set equal to  $y$  $y$  is set equal to  $r$ 

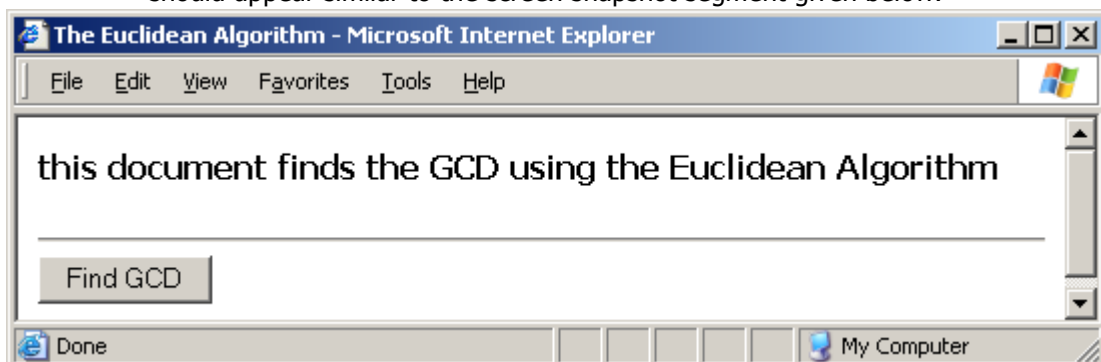
the process restarts.

**Steps to Complete this Project****STEP 1** **Open MS Notepad**Open MS Notepad on your computer and, within a new text document, type the HTML / VBScript code given in **Figure 1**, which follows. After you type the code, save the file as **Euclid.htm**.**Figure 1** **HTML / VBScript Source Code**

```

<html>
<head><title>The Euclidean Algorithm</title>
<script language = "VBScript">
' write function definition(s) here
</script>
</head>
<body>
<font face = "Tahoma">
<h2>this document finds the GCD using the Euclidean Algorithm</h2>
<hr>
<input type = "button" name = "GetData" value = "Find GCD">
</body>
</html>

```

**STEP 2** **Test the Initial Coded File**Locate the **Euclid.htm** file that you just constructed. Double - click the file to open the file in the Internet Explorer Web browser. Your Web browser should appear similar to the screen snapshot segment given below.

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**PROJECT** Loops - The Euclidean Algorithm ( GCD )**STEP 3** **Modify the File**

Return to Notepad and locate the following line of code in file **Euclid.htm** .

```
' write function definitions here
```

Modify the source by typing the following block of code. Place the new code directly below the above statement but before the closing `</script>` tag.

---

**Figure 1**      **HTML / VBScript Source Code**

---

```
Function findGCD(x, y)
  Dim a, b, remainder
  a = x
  b = y
  remainder = a Mod b
  Do while (remainder <> 0)
    remainder = a Mod b
    If (remainder = 0) Then
      document.write("GCD of " & x & " and " & y & " is " & b)
    Else
      a = b
      b = remainder
    End If
  Loop
  findGCD = 0
End Function

Sub GetData_OnClick()
  Dim num1, num2
  num1 = CInt(InputBox("Enter the x value."))
  num2 = CInt(InputBox("Enter the y value."))
  result = findGCD(num1, num2)
End Sub
```

---

**STEP 4** **Test the Application**

Save the file in Notepad, return to Internet Explorer and refresh the Web file.

Note: if prompted, you may have to allow for scripts to run within the browser.

Click the  button and when prompted, enter the following two sample numbers for which you wish to find their greatest common divisor. Try inputting, for example, the numbers 48 and 60.

Observe the output and verify the output's accuracy.

**STEP 5** **Modify the Application**

Return to Notepad and modify the application code such that your Web page will verify that the GCD evenly divides each of the given numbers.

For example, when the numbers 48 and 60 are input, your program will display the following:

```
The GCD of 48 and 60 is 12
48 = 12 × 4 + 0
60 = 12 × 5 + 0
```

**STEP 6** **Submit the Application**

Submit an MS Word document containing your source code and screen

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snapshots of your Web page when you input sample data values.