Loops

This project is made up of a collection of subprojects using the same form.
Do While loops must be used for all of the subprojects.
You should be using local variables (no global variables for this project)

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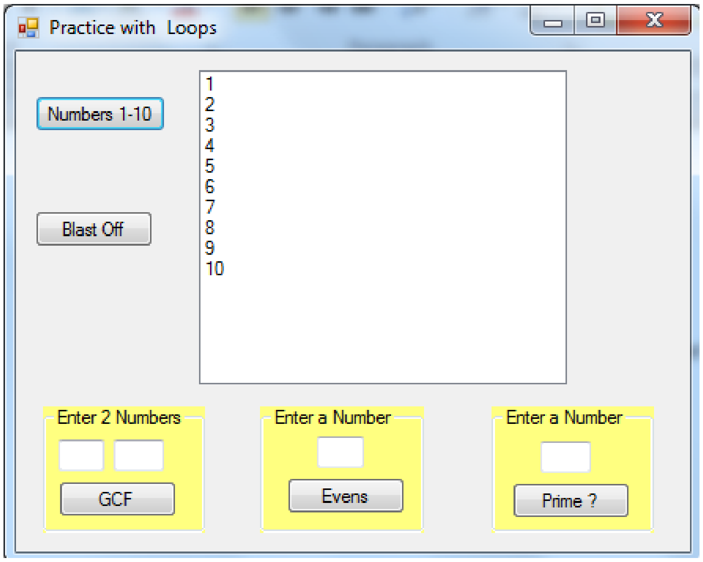
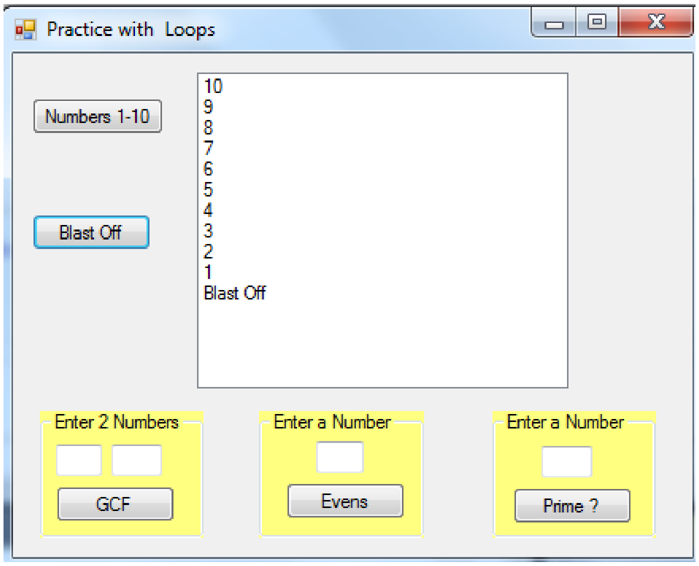
Part 1 Display Numbers –When the "Numbers 1-10" button is clicked, the numbers from 1-10 will be displayed in a listbox.



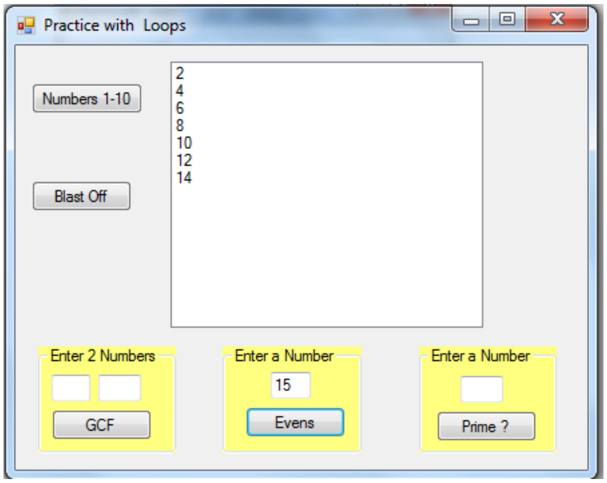
```
1
2
3
4
5
6
7
8
9
10
```

Part 2 Blast Off – when the "blast off" button is clicked, the listbox will display a countdown from 10 to blastoff.



```
10
9
8
7
6
5
4
3
2
1
Blast Off
```

Part 3 Even Numbers – the user will enter a positive integer and the even numbers form two through the entered number will be displayed in the listbox. When you test your program, be sure to enter both an odd number and an even number.



Enter a Number: 15

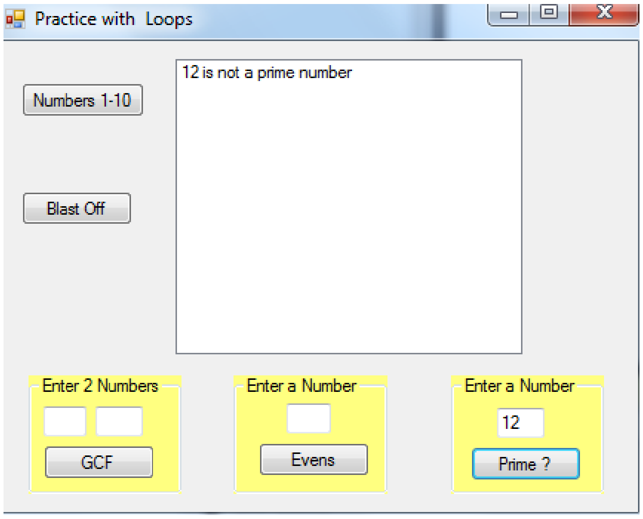
```
2
4
6
8
10
12
14
```

Part 4 Prime Time – the user will enter a positive integer. After determining whether or not the number is prime, an appropriate message will be displayed. A prime number is a number that is only divisible by 1 and itself.

Declare a Boolean variable, name it *prime*, and initialize it to *true*.

A portion of the pseudo code for this program might be:

```
    Check the values from 2 to num-1, where num is the value entered by the user.
    If num Mod value = 0 then set the variable prime to "false", otherwise, continue to check for possible factors.  You should exit the loop when prime is "false" or after checkiing all possible factors.
    Display appropriate message.
```



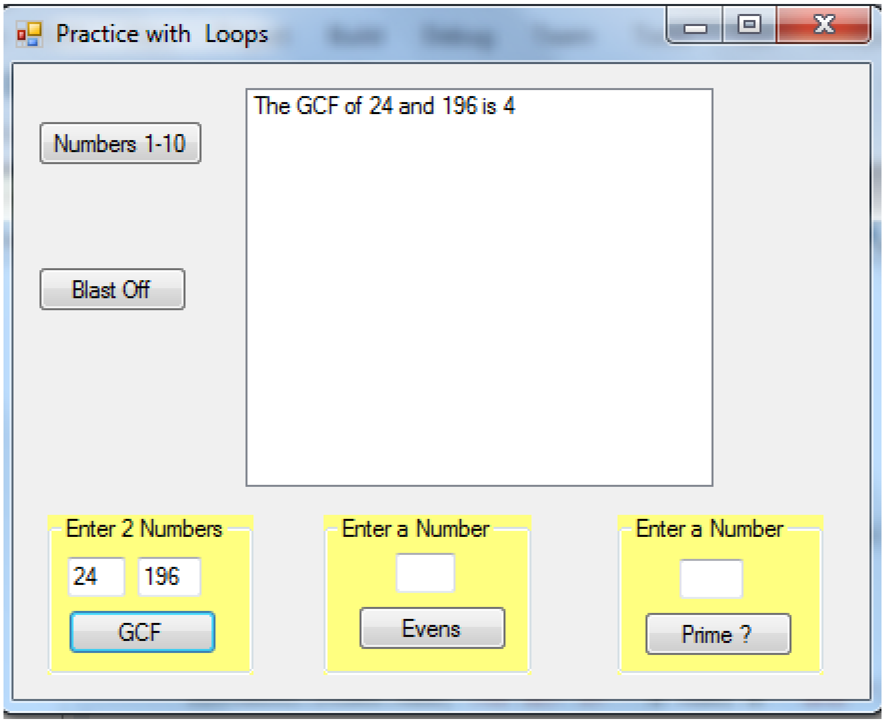
Enter a Number: 12

```
12 is not a prime number
```

Part 5 Greatest Common Denominator

The user will enter two numbers and the GCF for the two values will be returned.

Use a loop and modulus division to check all possible factors, the greatest factor common to both numbers should be displayed.



24 196

The GCF of 24 and 196 is 4

Extra Credit - Fibonacci Sequence

Each number of the Fibonacci sequence is the sum of the two preceding numbers.

1,1,2,3,5,8,13,….

Design and develop a program that will compute the first *n* integers of the Fibonacci sequence. Only accept values of *n* greater than 3 and less than or equal to 100. Display the results in a single column in a listbox.

Notes on Loops

Do While Loop

Do While *condition*
Statement(s)
Loop

If the condition is FLASE, the statements are not executed.
If the condition is TRUE, the statements are executed and when **Loop** is encountered, the condition is rechecked. You must increment or decrement the counter.

```
'The following code would display the numbers 8 – 12 in a listbox:
Dim num as Integer
Num = 7
Do While num < 12
      num = num +1
      lstNumbers.items.add(num)
Loop
```

```
'the following is an example of an infinite loop because the loop
never reaches the value 0.
Dim num as integer = 7
Do While num < > 0        ' Do While num is not equal to 0
      num = num - 2
      lstNumbers.items.add(num)
Loop
```

Listbox

```
listbox.items.add(item)   'where item is a value or a string
listbox.items.clear( )   'will clear the contents of a listbox
```

Modulus division – returns the remainder

```
num = 5 Mod 2     ' assigns a 1 to num

num = 6 Mod 3     ' assigns a 0 to num
```

note: if a num1 divides into num2 evenly, then (num2 Mod num1) would equal 0.