Lab #5B

Points: **45**

Introduction

In this lab you will practice using each of the C++ looping types: for, while and do...while. You will also practice correcting the input stream if it goes to the fail state. Be sure to read this lab thoroughly, especially the Hand-in Procedure

Lab

Write a complete program that:
1. Uses a **do...while loop** to prompt the user to enter a count that is greater than 1 and less than or equal to 10000 then reads in a count from the keyboard as an integer.
    a. If input error occurs or the count the user enters is less than or equal to 1 or greater than 10000, output an error. After outputting an error clear/ignore the failed input and continue do...while looping until a valid number is entered.
2. Uses a **for loop** to find the sum of all of the **even** numbers from 1 to the number input in (1).
3. Uses a **while loop** to find the sum of all of the **odd** numbers from 1 to the number input in (1).

Your program must handle the possibility that the user accidentally enters a character or out of bounds number. If a character or an out of bounds number is entered, the stream should be cleared, any previous values read should be discarded, an error displayed, and the user prompted again. The program should not exit until good values have been entered.

A do...while loop must be used to take in input. A for loop must be used to sum the even numbers. A while loop must be used to sum the odd numbers. Failure to do so will result in a 0 for this lab.

Example Output

An example of an interaction with your program is shown below, your output should match these examples exactly. (The words printed in blue are from the computer, based on your commands, the words in red are user input. Note: these colors are simply here to distinguish components and not needed in your program.):

Example **1**

```
Alexs-iMac:lab5b alex$ g++ -Wall -pedantic lab5b.cpp
Alexs-iMac:lab5b alex$ ./a.out
Enter a count between 2 and 10000
**10

Sum of even numbers: 30
Sum of odd numbers:  25
```

Example **2**

```
Alexs-iMac:lab5b alex$ g++ -Wall -pedantic lab5b.cpp
Alexs-iMac:lab5b alex$ ./a.out
Enter a count between 2 and 10000
**75

Sum of even numbers: 1406
Sum of odd numbers:  1444
```

Example **3**

```
Alexs-iMac:lab5b alex$ ./a.out
Enter a count between 2 and 10000
**5000

Sum of even numbers: 6252500
Sum of odd numbers:  6250000
```

Example **4**

```
Alexs-iMac:lab5b alex$ ./a.out
Enter a count between 2 and 10000
**1

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**-2

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**0

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**-56

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**2

Sum of even numbers: 2
Sum of odd numbers:  1
```

Example **5**

```
Alexs-iMac:lab5b alex$ ./a.out
Enter a count between 2 and 10000
**2353456456

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**23452345324

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**234245346

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**234235

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**1234

Sum of even numbers: 381306
Sum of odd numbers:  380689
```

Example **6**

```
Alexs-iMac:lab5b alex$ ./a.out
Enter a count between 2 and 10000
**e

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**whoops

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**incorrect

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**#24

Error: Invalid entry, please retry
Enter a count between 2 and 10000
**34

Sum of even numbers: 306
Sum of odd numbers:  289
```

Hand-In Procedure

1. Save

Save your code as **main.cpp**. Do not ignore this step or save your file(s) with different names.

2. Submit

You have until 11:59p Friday to complete this lab. **There will be no extensions for any reason. Your program must be submitted before the due day/time via CodeGrade. No emailed submissions will be accepted.**