Programming Assignment 5
(File I/O & Exception Handling)

Instructions:

- This assignment is to be turned in on Blackboard . You should submit '.cpp' files with names mentioned after each problem.

- Make sure your programs compile (without any compiler errors). You will not receive any credit if your program does not compile. If you are unable to complete any of the programs, submit the parts that work (with no compiler errors) for partial credit.

- Your grade will be based on functionality (does the program do what it is suppose to do), readability (is the code nicely formatted), and understandability (are the literals meaningful and is the code modular and well documented with appropriate comments). Try to incorporate all the good programming practices and styles. E.g., **WRITE COMMENTS**, declare all constants and variables at the top of a function, store quantities using the appropriate data types, declare function prototypes, etc.

---

1. File I/O (30 points)

HTML files use tags enclosed in angle brackets to denote formatting instructions. For example, <B> indicates bold, <I> indicates italics, etc. If a web browser is displaying an HTML document that contains '<' or '>' then it may mistake these symbols for tags. This is a common problem with C++ files, which contain many <'s and >'s. For example, the line "#include <iostream>" may result in the browser interpreting <iostream> as a tag. To avoid this problem, HTML uses special symbols to denote '<' and '>'. The < symbol is created with the string "<" while the '>' symbol is created with the string ">" .

Write a program that reads in a C++ source file and converts all '<' symbols to "<" and all '>' symbols to ">" . Also add the tag <PRE> to the beginning of the file and </PRE> to the end of the file. This tag preserves whitespace and formatting in the HTML document. Your program should create a new file with the converted output. To implement this, you should write a function 'convert' that takes the input and output streams as parameters.

As an example, given the following input file:

```
#include <iostream>
```

```
int main() {
      int x=4;
      if (x < 3) x++;
      cout << x << endl;
}
```

The program should produce a textfile with the following contents:

```
<PRE>
    #include &lt;iostream&gt;

    int main() {
          int x=4;
          if (x &lt; 3) x++;
          cout &lt;&lt; x &lt;&lt; endl;
    }
</PRE>
```

You can test your program with any .cpp file you have as input (Make sure to make a copy of the input file as you may loose it with incorrect File I/O). You should test your output file by opening it with a web browser. The contents should appear identical to the original source code.

Filename: htmlConvert.cpp

---

2. Exception Handling (20 points)

Design a class called *Date*. The class should store a date in three integers: month, day, and year. Include the relevant get/set methods. There should be separate member functions to print the date in the following forms:
12/25/13
December 25, 2013
25 December 2013

The class should implement the following exceptions classes:
InvalidDay - Throw when an invalid day (<1 or > 31) is passed to the class.
InvalidMonth - Throw when an invalid month (<1 or > 12) is passed to the class.

Demonstrate the working of this class in the main function. Make sure to ask the user for appropriate data and test the exception cases.

Filename: date.cpp
