Fall 1999, CMPT-101, Assignment 2

Introduction

This assignment will give you practice with if-else-if structures, and program design. You are *not* allowed to use functions, loops, vectors/arrays, or any other advanced features of C++. The point of this assignment is to get practice with decision structures and designing programs before you start coding them. You'll find that your program quickly becomes long and messy if you don't work it out on paper first!

Converting Between Dates

In this assignment, we want to write a program that converts dates of the form (year,day) to the form (month name, day of month, year). For example, here is what one complete run of your program might look like:

```
Please enter a year (e.g. 1930, 1588)
--> 1999

Please enter a day of the year
(e.g. enter 1 for January 1, enter 41 for February 11, etc.)
--> 275

(1999,275) is October 2, 1999

Done.
```

In this example, (1999, 275) is October 2, 1999 because October 2nd is the 275th day of 1999.

Your program must handle leap years. February has 29 days in a leap year, but only 28 days every other year. A year is a leap year if it's evenly divisble by 400, or if it's evenly divisible by 4 but not by 100. For example, 2000 is a leap year because it's evenly divisible by 400. That means the year 2000 has 366 days, and (2000, 366) is December 31, 2000. In contrast, 2001 is not a leap year, and so (2001, 366) does not exist because 2001 only has 365 days; (2001, 365) is December 31, 2001.

Also, you will need to know how many days each month has. April, June, September, and November each have 30 days. Every other month, except February, has 31 days. February has 28 or 29 days, as described above.

If the user enters an invalid day or year, then your program should quit after printing an error message telling the user what went wrong. For example:

```
Please enter a year (e.g. 1930, 1588)
--> 1900

Please enter a day of the year
(e.g. enter 1 for January 1, enter 41 for February 11, etc.)
--> 366

Oops! 1900 doesn't have that many days.
Please run the program again.
```

Your Program

Write a C++ program that converts dates of the form (year,day) to dates of the form (month name, day of month, year). Your program *must not* use any functions, loops, arrays/vectors; stick to concepts and ideas up to, and including, those discussed in chapter 4 of the textbook.

Your program should produce output like that shown above. It should fail "gracefully" if the user types invalid data. Use `cin.fail()`, as described in the textbook, to check if the user has entered non-numeric input. Your program's error messages should be as specific and as helpful as possible.

Examples to Try

Test your program on *at least* these examples, and make sure to hand them in for the markers to see:

Example 1 $(1999, 275)$ is October 2, 1999

Example 2 $(1900, 60)$ is March 1, 1900

Example 3 $(1632, 60)$ is February 29, 1632

Example 4 $(-1935, 3)$ is an invalid year

Example 5 $(2100, 366)$ is an invalid day

Example 6 $(thisyear, 34)$ is a non-numeric and invalid year

Example 7 $(5734, sixteen)$ is a non-numeric and invalid day

Remember, for the invalid dates, your program should print out a unique error message for each different kind of error.

What To Hand In

On the CMPT-101 home pages is a document that explains everything you need to hand in. Follow those instructions for this assignment.