CS150 Assignment 4

Calendar

Date assigned: Wednesday, October 6, 2010
Design Documents Due: Monday, October 11, 2010, 5 pm (5 points)
Date due: Friday, October 15, 2010, 9:15 am (35 points)
Total points: 40

Problem

Many times I'm sitting at my computer without a calendar and all I know is today's date and the day of the week. What I would like to see is a calendar for the entire month given by the user. An example might be using today's date, 10/26/09 and Monday, a calendar would be printed out for the entire month of October properly labeled.

The purpose of this assignment is exactly that. Ask the user to enter a date in the form month, day, and year (all integers). Also, ask the user to enter the current day where 0 = SUN, 1 = MON, 2 = TUE, 3 = WED, 4 = THU, 5 = FRI, 6 = SAT. From here your program will calculate and print a correct calendar for the particular month specified by the user.

A sample output of the calendar follows assuming that the date entered was January 1, 1991 and that day was Tuesday. You are to align your calendar exactly as you see it below.

```
                1991

             JANUARY

    S   M   T   W   T   F   S
   --------------------
            1   2   3   4   5
    6   7   8   9  10  11  12
   13  14  15  16  17  18  19
   20  21  22  23  24  25  26
   27  28  29  30  31
```

New C++ Commands

```
system("cls");    // clears the screen.
system("pause");  // pauses the program until
                  // the user hits a key AND
                  // Prints "Press any key to continue . . ."
                  // on the screen
                  // No extra include libraries are needed!
```

Output

The output for this program should look and work exactly as follows (sample input given in bold):

[SCREEN #1]

```
**************************************************
*                   Calendar                     *
**************************************************

Please enter the calendar year: 1991

Please enter the calendar month: 16
Please enter the calendar month: 1

Please enter the calendar day: 1

Please enter the day of the week: 2

Thank you. Press any key to continue . . .
```

[SCREEN #2]

```
               1991

               JANUARY

    S  M  T  W  T  F  S
    --------------------
          1  2  3  4  5
    6  7  8  9 10 11 12
   13 14 15 16 17 18 19
   20 21 22 23 24 25 26
   27 28 29 30 31
```

Notes

- You will need to take into consideration whether the year entered is a **leap year**. As you recall, a year is a leap year if it is divisible by 4, unless it is a century year where it is a leap year only if it is divisible by 400.

- Your program must work for any given date and day combination

- You need to validate each piece of input, and ask for input until valid input is given (using the original message to the screen). Years must be positive, month must be between 1 and 12, calendar day must be between 1-31, day of the week must be between 0-6. You also need to make sure the calendar day is a **valid date** (April 31 does not exist).

- You **do not** need to validate that the input day of the week given actually matches the day of the week the given date falls on.

To complete this assignment you must

1. Create a new C++ project in Visual Studio. Name your project **04Calendarxxxxxxxx**, where xxxxxxxx must be replaced by your PUNetID. As an example, my project would be called "04CalendarWill4614". It is vital that you name your project correctly!
2. Type the solution (**fully documented/commented**) to the problem into your project.
3. Remember to enter in your name as the author of the program.
4. Make sure that your program compiles and runs correctly. If you get any errors, double check that you typed everything correctly. Be aware that C++ is case-sensitive.
5. Once you are sure that the program works correctly it is time to submit your program. You do this by logging on to Turing and placing your complete project folder in the **CS150-02 Drop** folder. Make sure that you copy your program folder and don't move the folder. If you move the folder, then you will not have your own copy!

Submit an electronic copy of your design document

Before you start you need to think about the data in your program and the calculations and loops you will need to perform. Answer the following questions in a **new** GoogleDoc (**CS150_04ProgramDesignPUNetID**) and share the document with the instructor (profchadd@gmail.com). Be sure to answer the questions in complete sentences where appropriate. This design document is due on **Monday at 5 pm.**

Design Questions:
1. List each variable declaration necessary to store the data and information in your program. Be sure to name your variables clearly so readers of your code will have no problem understanding their purpose. Pay very close attention to the data types for each variable.

2. Briefly describe the calculations you will need to perform in your program. Be sure to explain which variables from 1. will be used in each calculation.

3. For each loop used in your program, discuss what will happen in the loop and what data and conditions will be used by the program to stop the loop.

Notes

1. You must follow the coding standards.
2. You must **validate each piece of input**.
3. You must use constants when possible.
4. Your program will be graded on **efficiency**. In other words, you will be marked down for repeating code statements unnecessarily.
5. You may only use the C++ programming concepts covered thus far in class. Do not use any more advanced concepts that we have not covered or any other programming concepts that you have had experience with.
6. Your output must look **exactly** like the sample given.

Remember, this is an individual assignment. Refer to the syllabus for assignment policies