

CS150 Assignment 2

Day Calculator

Date assigned: Monday, September 19, 2005

Date due: Monday, September 26, 2005

Points: 50

1 Problem

You are to write a C++ program that will interactively input a date in the form month, day, and year. After the user inputs a date, your program will calculate and print the date and the corresponding day of the week for the date that was input.

For the purpose of this problem, January and February are considered to be the 13th and 14th months of the preceding year, while March through December are months 3 through 12 of the current year. With this in mind, the formula to determine the day is:

$$n = \text{day} + 2 * \text{month} + \text{int} (3 * (\text{month} + 1) / 5) + \text{year} + \text{int} (\text{year} / 4) - \text{int} (\text{year} / 100) + \text{int} (\text{year} / 400) + 1$$

If we now take this value of n and divide it by 7, the integer remainder of the division will determine the day of the week for the date entered.

Looking at December 31, 1972, the value for n is equal to 2513. If we divide 2513 by 7 we come up with 359 remainder 0 which tells us that the day is Sunday since 0 = SUN, 1 = MON, 2 = TUE, 3 = WED, 4 = THU, 5 = FRI, 6 = SAT.

Looking at January 1, 1993, the value for n is 2511. This implies that January 1, 1993 begins on Friday.

Your program must ask the user for the date where month, day, and year are entered as **mm/dd/yyyy**. Considering January 1, 1993, this is exactly how your program is to work:

```
*****
*                               Day Calculator                               *
*****
```

```
Enter the date of interest (mm/dd/yyyy): 01/01/1993
```

```
The date 01/01/1993 is a FRIDAY
```

The bold text is what the user enters.

2 You need to do the following for this assignment

1. Program Documentation

(a) **Assignment Details and Introduction:** At the top of the page, write down the course number, assignment number, your name, my name, due date and submission date. After that, write one paragraph describing what your program does. Here you are restating the problem in your own words.

(b) **Problem Analysis:** Identify the input to your program, the output from your program, and any internal data in your program. You should also identify the data type and indicate whether it should be a variable or a constant.

(c) **Algorithm:** Write out the steps that you'll need to do complete the program. Be as detailed as possible. It will help you write the program. When writing the steps of the algorithm, don't write any C++ code.

(d) **Test Results:** These are solutions to the problem using some method other than your computer program. They are often done by hand, but could include experimental or other results. These results should be explicitly compared to those from the program to demonstrate that the program works. The number of specific cases done should be sufficient to prove beyond a reasonable doubt that the program works.

2. Program Implementation: Write the C++ code and build and run it in Visual Studio .NET. Make sure to include as many comments as necessary. Test the code as much as you can for different values to make sure it works. Remember, if your program does not build or run you will lose 70% of the program points.

3 What to turn in

Place your completed project in the CS150-01 Drop folder on Turing by 1pm on Monday, September 26. Reintroduce yourself to the late policy. Your project must be created in Visual Studio .NET. I will not accept any other project.

Note: 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.

START EARLY!!