

CS150-01 Assignment 5

Calendar

Date Assigned: Wednesday, October 13, 2004

Date Due: Wednesday, October 20, 2004

Points: 50 (40 for the program, 10 for the documentation)

1 Problem statement

Write a C++ program that will allow the user to input a month and a year, and will output a calendar for that particular month. It should be organized in grid format, with the month and year centered over the grid. Under that there should be seven columns labeled Sun, Mon, Tue, Wed, Thu, Fri, Sat. The first of the month must appear under the correct day and the rest of the days in the month lined up appropriately.

Your output should look exactly like the following:

```
THE NIFTY CALENDAR
```

```
Welcome to the calendar program!
```

```
Please enter the month and year for which you would
```

```
like to view a calendar (e.g. 10 2004): 10 2004
```

```
OCTOBER 2004
```

```
Sun Mon Tue Wed Thu Fri Sat
```

```
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
```

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.

To calculate the day on which a particular date falls, the following algorithm may be used:

- $a = (14 - \text{month}) / 12$
- $y = \text{year} - a$
- $m = \text{month} + 12 * a - 2$
- $d = (\text{day} + y + y/4 - y/100 + y/400 + (31 * m)/12) \% 7$

where year is the four-digit year, month is the integer between 1 and 12, day is the day of the month, and d is the day of the week. The value for d is 0 for Sunday, 1 for Monday, 2 for Tuesday, etc.

2 You need to do the following for this assignment

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1. Program Documentation

- 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
- 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.
- 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.
- 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 then build and run it in Visual Studio .NET. Name your project "05CalendarPUN-etId", e.g. "05Calendarkhoj0332".
- Make sure to comment your code.
- Follow the coding standards. Use the coding standards that I handed out with the previous assignment.
- Test the code as much as you can for different values to make sure it works.
- Remember, code that does not build or run loses 70% of the points.

3 What to turn in

1. Turn in your program documentation to me in class on the day it's due. These should be hard copies. You may write them by hand or use a word processing program to generate them, but please make sure that they are neat and easy to read!
2. Turn in a hard copy of your code attached to the documentation. You must make sure that your code follows the coding standards in order for you to receive full credit.
3. Place your completed project folder in the CS150-01 Drop folder by 1pm on Wednesday, October 20. Anything turned in after that but before 1pm on Thursday, October 21, will be considered late and you will automatically lose 20% of the grade. Your project **MUST** be created in Visual Studio .NET, and you **MUST** submit the complete Visual Studio .NET project folder otherwise you will receive a zero on this assignment.

4 Optional extension

If you would like to try something more challenging, then extend the above program so that it asks for a single year and displays the full calendar (all 12 months) for that year. The full calendar should be written to a file.