

CSCI 1060U - Laboratory #4
Creating a Calendar in C++
Due: Sunday, Oct. 18, 2020 (11:59pm)

Introduction

This lab will give you an opportunity to practice using C++. In this lab you will be making a text-based calendar program that looks like:

```
JUNE 2020

  S  M Tu  W Th  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
```

Your calendar should be able to print months in the future and in the past.

Activity #1

In C++ create a calendar program that has the following two functions:

- **printMonth** – this function has two parameters (month, year) and will print out the calendar for the specified month in the format discussed in the introduction to this lab.
- **printYear** – this function has one parameter (year) and will print out the calendar for all 12 months in that year.

In addition to the above functions you should also create a main function that will test your program. In the main function the program should ask the user if he/she wants a year or month calendar. If the user wants a year calendar the program should input the year. If the user wants a month calendar the program should input the month and year.

In order to print the calendar for a given month you need to write an algorithm to determine which day of the week the first day of the month is on. You can determine this using the following information:

1. **Number of days in each month.**
 - a. January – 31 days
 - b. February – 28 or 29 days
 - c. March – 31 days

- d. April – 30 days
- e. May – 31 days
- f. June – 30 days
- g. July – 31 days
- h. August – 31 days
- i. September – 30 days
- j. October – 31 days
- k. November – 30 days
- l. December – 31 days

2. Leap years.

In a leap year February has an extra day, which is why February can be either 28 or 29 days long. Years that are evenly divisible by 4 are leap years except when the year is also evenly divisible by 100. There is also an exception to this rule since years that are evenly divisible by 100 but also evenly divisible by 400 are considered leap years. For example:

- 2009 is not a leap year because it is not evenly divisible by 4.
- 2008 was a leap year because it was evenly divisible by 4 and not evenly divisible by 100.
- 1900 was not a leap year because even though it was evenly divisible by 4 it was also evenly divisible by 100 (and not evenly divisible by 400).
- 2000 was a leap year because it is evenly divisible by 4, evenly divisible by 100 and evenly divisible by 400.

3. Identifying the day of the week that a month starts on.

There are different approaches to figure out what day of the week the first day of month is on. One good resource for developing your algorithm is <https://cs.uwaterloo.ca/~alopez-o/math-faq/node73.html>.

NOTE: For all labs you are required to comment your source code. Failure to comment will result in marks being deducted – even if the lab solution is implemented correctly.