CSCI 2170   OLA 1
(Design Due: Midnight, Monday, September 7th.
Program Submission Deadline: Monday, Sept 14th)

Write a C++ program that, given a person's birth date, will display the day of the week the person was born, and indicate whether the person is born in a leap year. Name your source code "weekday.cpp".

Part one: determine the day of the week one was born.
We use the formula called the : **Zeller's Rule** to compute the day of the week for a person's birthday. The following formula is named Zeller's Rule after a Reverend Zeller. Here's the formula:

$$f = d + (13*m-1)/5 + D + D/4 + C/4 - 2*C.$$ ← declare all variables to be of integer type

- d is the day of the month. Let's use January 29, 2064 as an example. For this date, d = 29.
- m is the month number. Months have to be counted in a special way for Zeller's Rule: March is 1, April is 2, and so on to January is 11, and February is 12. (This makes the formula simpler, because on leap years February 29 is counted as the last day of the year.) Because of this rule, January and February are always counted as the 11th and 12th months of the previous year. In our example, m = 11. (use if-else if statement to compute the m value)
- if original birth month is January or February:
  subtract 1 from year value. In our case, birth month is January, therefore, year = 2064 - 1 = 2063.
- D is the last two digits of the modified year value. In this example, D=2063%100=63.
- C stands for century: it's the first two digits of the modified year value.
  In our case, C = 2063/100= 20.

Now let's substitute our example numbers into the formula.
$$f = d + [(13*m-1)/5] + D + [D/4] + [C/4] - 2*C$$
$$= 29 + [(13*11-1)/5] + 63 + [63/4] + [20/4] - 2*20$$
$$= 29 + [28.4] + 63 + [15] + [5] - 40$$
$$= 29 + 28 + 63 + 15 + 5 - 40$$
$$= 100.$$
This number modulo 7 is the day of week: (0:Sunday, 1:Monday, 2:Tuesday, 3:Wednesday, 4:Thursday, 5:Friday, 6:Saturday). Use if-else if statement to display the day of the week.

If the remainder is negative, add 7 to the remainder.
For example, 100%7= 2. Therefore Jan 29th, 2064 is on Tuesday.

Part two: determine whether a particular year is a leap year or not
Normally, a year is a leap year if it is divisible by 4. But, if the year is the last year of a century, e.g., 1900, 1800, then it is a leap year if it is divisible by 400. Therefore, 1900 is not a leap year, but 2000 is a leap year.

Check for User inputs

Your program should check for user inputs. If the value entered is not a valid value, for example, month value is not within the range 1-12, day value is not within the range 1-31, or year value is negative or greater than 2015, send out a message and stop the program.

To turn in your program to be graded, run your program 6 times with the following data:
  1. 3   40   1980
  2. 1   24   -1956
  3. 2   25   2001
  4. 3   1   1996
  5. 4   28   1900
  6. **your birth date**
The following is an example run of the basic version of the program:

Documentation and program indentation and formatting
- Make sure to write the program with indentation and formatting style as discussed in "General Program Requirements for Open Labs".

Electronically submit the program in D2L Dropbox named "Open Lab 1". You are only required to submit the source files: **weekday.cpp.**