Introduction to Programming 1
Lab 5: Calendar Project

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1) Write a program that, given a person's birth date (or any other date in the Gregorian calendar), will display the day of the week the person was born.

To determine the day of the week, you will need to first calculate the day of the week for December 31 of the previous year. To calculate the day for December 31, use the following formula.

$$\left((year-1)\times 365+\left[\frac{year-1}{4}\right]-\left[\frac{year-1}{100}\right]+\left[\frac{year-1}{400}\right]\right)\%7$$

The formula determines the day based on the values as shown below.
Day 0: Sunday
Day 1: Monday
Day 2: Tuesday
Day 3: Wednesday
Day 4: Thursday
Day 5: Friday
Day 6: Saturday

Once you know the day for December 31, you simply calculate the days in the year before the month in question. Use a *switch* statement to make this calculation. If the desired month is 12, add the number of days for November (30). If it is 11, add the number of days for October (31). If it is 3, add the number of days for February (28). If it is 2, add the number of days for January (31). If you do not use a break, between the months, the switch will add the days in each month before the current month.

To this figure, add the the day in the current month and then add the result to the day code for December 31. Thus number modulo seven is the day of the week.

There is one more refinement. If the current year is a leap year, and if the desired date is after February, you need to add 1 to the day code. The following formula can be used to determine if the year is a leap year.

$$\left(!(year\%4)\ \&\&\ (year\%100)\ ||\ !(year\%400)\right)$$

Your program should have the option to get data from the user, to calculate the day of the week, and a third to print the result.

To test your program, run it with the following dates:

- February 28, 1900, and March 1, 1900
- February 28, 1955, and March 1, 1955
- February 28, 1996, and March 1, 1996
- February 28, 2000, and March 1, 2000
- December 31, 1996
- The first and last dates of the current week.

2) Write a C program to create a calendar for a year. The program reads the year from the keyboard. It then calculates which day of the week (Su, Mo, Tu, We, Th, Fr, Sa) is the first day of the year and prints the calendar for that year. After printing the year, it should ask if the user wants to continue. If the answer is yes, it will print the calendar for another year until the year is done. The program prompts the user for the input, as shown below.

```
Enter the year for your  calendar : 2000
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```
                              2000

      January                 February                  March
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                   1         1  2  3  4  5           1  2  3  4
 2  3  4  5  6  7  8   6  7  8  9 10 11 12   5  6  7  8  9 10 11
 9 10 11 12 13 14 15  13 14 15 16 17 18 19  12 13 14 15 16 17 18
16 17 18 19 20 21 22  20 21 22 23 24 25 26  19 20 21 22 23 24 25
23 24 25 26 27 28 29  27 28 29              26 27 28 29 30 31
30 31

       April                    May                    June
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                   1      1  2  3  4  5  6              1  2  3
 2  3  4  5  6  7  8   7  8  9 10 11 12 13   4  5  6  7  8  9 10
 9 10 11 12 13 14 15  14 15 16 17 18 19 20  11 12 13 14 15 16 17
16 17 18 19 20 21 22  21 22 23 24 25 26 27  18 19 20 21 22 23 24
23 24 25 26 27 28 29  28 29 30 31           25 26 27 28 29 30
30

        July                   August                 September
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                   1         1  2  3  4  5                 1  2
 2  3  4  5  6  7  8   6  7  8  9 10 11 12   3  4  5  6  7  8  9
 9 10 11 12 13 14 15  13 14 15 16 17 18 19  10 11 12 13 14 15 16
16 17 18 19 20 21 22  20 21 22 23 24 25 26  17 18 19 20 21 22 23
23 24 25 26 27 28 29  27 28 29 30 31        24 25 26 27 28 29 30
30 31

      October                 November                December
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6  7            1  2  3  4                 1  2
 8  9 10 11 12 13 14   5  6  7  8  9 10 11   3  4  5  6  7  8  9
15 16 17 18 19 20 21  12 13 14 15 16 17 18  10 11 12 13 14 15 16
22 23 24 25 26 27 28  19 20 21 22 23 24 25  17 18 19 20 21 22 23
29 30 31              26 27 28 29 30        24 25 26 27 28 29 30
                                            31
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