CS101 Homework #2

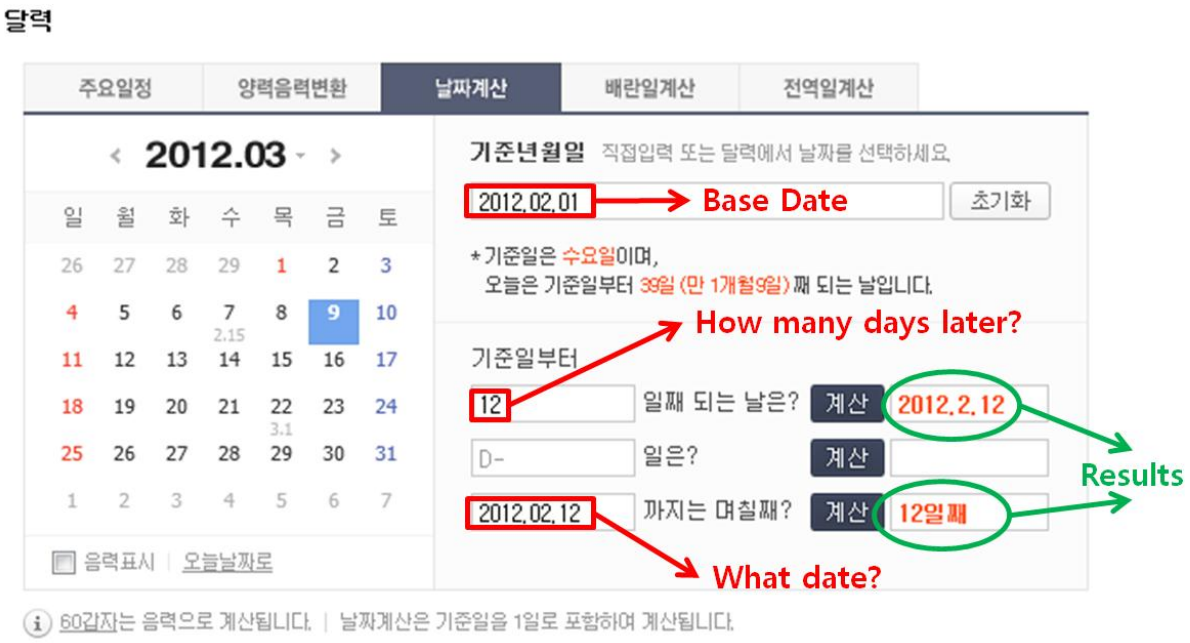
Day Calculator

Due date: Tues, Mar 20, 2012 (until 23:59)

Please read the homework description in this article and the given template code carefully and make sure that your program meets all the requirements stated. The homework is an individual task. You can discuss the problem with your friends but you must not program together. **You will get F on entire course if your homework includes any plagiarism.**

Goal

We will build a calculator for day calculations such as celebrating some anniversaries that are measured in days. For instance, couples celebrate when they have been together for 100, 200, or 1000 days.



< Figure 1 : Day Calculator from Naver >

(Click the above link in order to see how the day calculator from Naver works)

As shown in figure 1, there exists a day calculator which supports three ways of day calculation.

In this homework, you will implement only two ways among them like the followings :

(1) What date is it after a certain number of days have passed since a base date?

(2) How many days have passed since a base date until the other date?

Requirements

You are not allowed to modify the given template codes except for 'Definitions' section. If you modify the given template codes except for 'Definitions' sections, you'll get -10 points.

```
Enter base date : 2012.02.01
2012.02.01 is Wednesday

1. How many days later?
2. What date?
3. Quit
Select : 1

How many days later do you want to know : 12
2012.02.12 is Sunday

2012.02.12 has been 12 days since 2012.02.01

Enter base date : 2012.02.01
2012.02.01 is Wednesday

1. How many days later?
2. What date?
3. Quit
Select : 2

Enter a date : 2012.02.12
2012.02.12 is Sunday

2012.02.12 has been 12 days since 2012.02.01
```

< Figure 2 : Test run of the complete program >

When you execute the original given template codes, the program will not work as shown in figure 2.

In order for the program to work as shown in figure 2, you have to implement seven functions in 'Definitions' section such as **'month_to_num_of_days', 'is_valid_date', 'what_day', 'date_to_num', 'num_to_date', 'date_after_days', and 'number_of_days_between_dates'**.

Please, read the description in the given template codes carefully and implement seven functions in accordance with the description.

Assumptions

1. When you calculate how many days have passed since a given base date, you should consider 1 day has passed already for the given base date.

   (e.g.) When 2012.02.01 is given as a base date,

   2012.02.01 has passed 1 day since 2012.02.01

   2012.02.05 has passed 5 days since 2012.02.01

   2012.02.28 has passed 28 days since 2012.02.01

2. Each month has the number of days as shown in figure 3.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Days	31	28 or 29	31	30	31	30	31	31	30	31	30	31

< Figure 3 : The number of days for each month >

♣ Note : February can have either 28 or 29 days. (29 days if leap year, otherwise 29 days)

3. In order to check whether a year is a leap year or not, you can use 'isleap' function in 'calendar' module like the following :

```
from calendar import *
for i in range( 2010, 2015 ) :
    if isleap(i) :
        print '%d is leap year' % (i)
    else :
        print '%d is not leap year' % (i)

>>> 2010 is not leap year
>>> 2011 is not leap year
>>> 2012 is leap year
>>> 2013 is not leap year
>>> 2014 is not leap year
```

Evaluation

Your program will be tested with several possible cases like followings :

(♣ Test cases are similar to the given cases above, but not exactly same)

[Two dates : base date or new date]
Valid dates : 1901.01.01, 1901.02.01, 1901.03.01, 1902.03.01, 1902.01.01, 2012.02.13
Invalid dates : 2012.02.30, 2012.13.01, 2100.04.12

[The number of days]
1, 31, 59, 424, 365, 40585

Please, try to make as many your own cases as possible and test your program with them in order to verify your program.

(♣ You can double-check your program with day calculator from Naver using your own cases to verify your program.)

Submission

You need to submit the followings

- The file "yourid.py": the program that solves the 'Day Calculator' problem

(e.g.) 20121234.py

- The report "yourid.doc or docx" (Microsoft Word file):

In the report, you have to describe the way to solve the problem and show your test cases and the results as shown in figure 2. (At least, more than 4 cases for each menu are recommended.). - (e.g) 20121234.doc or 20121234.docx

You must archive those two files into "yourid.zip" and submit the archived file to the web page for homework submission.

(e.g.) 20121234.zip

♣ If you do not archive with .zip extension, you will have a penalty.