ITCS 209 Object Oriented Programming	Name:	Lab	Challenge Bonus	Peer Bonus
	ID:			
	Sec:			

Lab03: Class, Objects, Methods (Baby one more time!)

Hint: This lab may sound tedious, but if the follow the provided steps and algorithms, you should be fine.

You are provided with the `DateTester` class, which is a program starter class**. Do not modify this class.** Your task is to implement the `MyDate` class in MyDate.java, which is used in `DateTester`, with the following variables, constructors, and methods. Only submit MyDate.java to MyCourses.

Instance Variables

`year` (int): Between 1 to 9999
`month` (int): Between 1 to 12
`day` (int): Between 1 to 28|29|30|31, where the last day depends on the month and whether it is a leap year for Feb (28|29).
`objectNumber` (int): The object number of the instance

Static Class Variables

`objectCounter` (int): Initialized to be zero; Incremented when an object of `MyDate` is created.
`strMonths` (String[]): An array of strings for the list of 12 month names ("January", "February", "March", "April", "May", "June", "July", "August", "September", "October", "November", "December").

Constructors

`MyDate()`: Sets `year`, `month`, and `day` to be 1900, 1, and 1 respectively; increments `objectCounter`; Sets `objectNumber` to be `objectCouter`.
`MyDate(int aYear, int aMonth, int aDay)`: Sets `year`, `month`, and `day` to be `aYear`, `aMonth`, and `aDay` respectively; increments `objectCounter`; Sets `objectNumber` to be `objectCouter`.

Instance Methods

`int getObjectNumber()`: Returns `objectNumber`.
`void setDate(int aYear, int aMonth, int aDay)`: Sets `year`, `month`, and `day` to be `aYear`, `aMonth`, and `aDay` respectively.
`void setYear(int aYear)`: Sets year to be `aYear`.
`void setMonth(int aMonth)`: Sets year to be `aMonth`.
`void setDay(int aDay)`: Sets year to be `aDay`.
`int getYear()`: Returns `year`.
`int getMonth()`: Returns `month`.
`int getDay()`: Returns `day`.
`String toString()`: Returns the date string in the format "DD Month YYYY", e.g., "5 February 2016". Hint: Use `strMonths` and `month` for the index.
`MyDate nextDay()`: Advance the date (`day`, `month`, and `year`) of the current object by one day and returns **the same object** (i.e. `return this;`). Be careful about "31 December" (See algorithm).
`MyDate nextMonth()`: Advance the date (`day`, `month`, and `year`) of the current object by one

month and returns the same object. Be careful about "December".
`MyDate nextYear()`: Advance the date (`day`, `month`, and `year`) of the current object by one year and returns the same object. Be careful the case Feb 29 going to the next year with Feb 29 (should become day 28).
`MyDate previousDay()`: Reverse the date (`day`, `month`, and `year`) of the current object by one day and returns the same object. Be careful about "1 January" (See algorithm).
`MyDate previousMonth()`: Reverse the date (`day`, `month`, and `year`) of the current object by one month and returns the same object. Be careful about "January".
`MyDate previousYear()`: Reverse the date (`day`, `month`, and `year`) of the current object by one year and returns the same object. Be careful the case Feb 29 going to the previous year with Feb 29 (should become day 28).

Static Method
`boolean isLeapYear(int year)`: Check if the year is a leap year. A year is a leap year if its February has 29 days (See leap year algorithm below).

Note
Java's array declaration example:
```
int[] myList = new int[10]; //10 is the size of the array myList
```
Java's array initialization example:
```
int[] myList = {12, 98, 34, 56, 72}; //The size of this array is 5
```
Java's array element access example (The same as in C language):
```
int a = myList[0];//0 is the index of the element being accessed
myList[1] = 35;
```

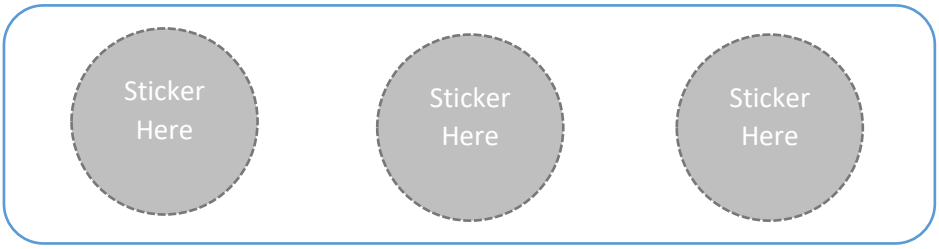
***** Refer to the FULL version of this lab (on MyCourses) for useful algorithms and expected output.***

Challenge Bonus (Optional):

Finish and submit this lab by 4:30PM!!

* This week's challenge cannot be submitted next week. *

Peer Bonus (Optional):



Algorithms

```
boolean isLeapYear(int year):
1. If year is not divisible by 4 Then
   1.1. Return false (not a leap year)
   Else If year is not divisible by 100 Then
   1.2. Return true (a leap year)
   Else If year is not divisible by 400 Then
   1.3. Return false (not a leap year)
   Else
   1.4. Return true (a leap year)

MyDate nextDay():
1. If month = 12 AND day = 31 Then
   1.1. year <- year + 1
   1.2. month <- 1
   1.3. day <- 1
   Else
   1.4. If month = 4 OR 6 OR 9 OR 11 Then
        1.4.1. If day = 30 Then
                 1.4.1.1. month <- month + 1
                 1.4.1.2. day <- 1
               Else
                 1.4.1.3. day <- day + 1
         Else If month ≠ 2 Then
        1.4.2. If day = 31 Then
                 1.4.2.1. month <- month + 1
                 1.4.2.2. day <- 1
               Else
                 1.4.2.3. day <- day + 1
         Else
        1.4.3. If year is leap year AND day = 29 Then
                 1.4.3.1. month <- month + 1
                 1.4.3.2. day <- 1
               Else If year is not leap year AND day = 28 Then
                 1.4.3.3. month <- month + 1
                 1.4.3.4. day <- 1
               Else
                 1.4.3.5. day <- day + 1
2. Return current object
```

```
MyDate previousDay():
1. If month = 1 AND day = 1 Then
   1.1. year <- year - 1
   1.2. month <- 12
   1.3. day <- 31
   Else
   1.4. If month = 5 OR 7 OR 10 OR 12 Then
        1.4.1. If day = 1 Then
                 1.4.1.1. month <- month - 1
                 1.4.1.2. day <- 30
               Else
                 1.4.1.3. day <- day - 1
         Else If month ≠ 3 Then
        1.4.2. If day = 1 Then
                 1.4.2.1. month <- month - 1
                 1.4.2.2. day <- 31
               Else
                 1.4.2.3. day <- day - 1
         Else
        1.4.3. If year is leap year AND day = 1 Then
                 1.4.3.1. month <- month - 1
                 1.4.3.2. day <- 29
               Else If day = 1 Then
                 1.4.3.3. month <- month - 1
                 1.4.3.4. day <- 28
               Else
                 1.4.3.5. day <- day - 1
2. Return current object
```

Expected Output

```
Object Number (a): 1
a's Date: 1 January 1900
a's Date: 31 December 1899
a's Date: 1 January 1900
a's Date: 1 December 1899
a's Date: 1 January 1900
a's Date: 13 April 2000
a's year is 2000, which is a leap year.

Object Number (b): 2
b's Date: 28 February 2016
b's Date: 29 February 2016
b's Date: 1 March 2016
b's Date: 1 March 2017
b's Date: 1 April 2017
b's Date: 1 April 2016
b's year is 2016, which is a leap year.

Object Number (c): 3
c's Date: 2 March 2017
c's Date: 1 March 2017
c's Date: 28 February 2017
c's Date: 28 February 2016
c's Date: 29 February 2016
c's Date: 28 February 2015
c's year is 2015, which is not a leap year.
```