

## Instructions

Write your name as a comment in the beginning of each class.

(6 marks):

As the following UML diagram, create a class called Date that includes three pieces of information as private instance variables: day, month, year as integer data type. Your class should have the following:

- *Provide a set and a get method for each instance variable.*
- *Provide a Constructor with no arguments to set the default date (1/1/2001).*
- *Provide a method named **increment** that adds one to the day, it should maintain month and year if needed like this example: when the date is 31/12/2011 if incremented the new date must be 1/1/2012.*
- *Provide a method named **decrement** that subtract one from the day, it should maintain month and year if needed like this example: when the date is 1/1/2011 if decremented the new date must be 31/12/2010. Note that year cannot be negative: if date is 1/1/0 and decrement is called you should print "ERROR: year cannot be negative" and make the date as it is 1/1/0.*

- Provide a method named **getMaxDay** that receives month as integer and return the max days of that month. Consider the following table to determine the length of each month (28,30, or 31)

Month Number	Month	Days in Month
1	January	31
2	February	28
3	March	31
4	April	30
5	May	31
6	June	30
7	July	31
8	August	31
9	September	30
10	October	31
11	November	30
12	December	31

- Provide a method **Read()** to read the values of all data members from the user. You should check if the input is valid. For example: if the user enters 30 as day and 2 as month and 2000 as year you should not accept this input and display an error message that says "ERROR: month 2 cannot be 30 days" (hint: use method getMaxDays). Also, you should check that months cannot be less than 1 or greater than 12 and days cannot be less than 1.
- Provide a method **Display()** to show the date. If the day=1 , month =2, and year=2020 you should print 1/2/2020.

Write another class named **TestDate** with main to do the following:

1. Create a new object of type Date.
2. Display menu that show the following options.
  - Display the date.
  - Change the date.
  - Increment the date.
  - Decrement the date.
  - Exit.

Date
- day: int - month: int - year: int
+Date() + setDay (day: int) + setMonth (month: int) + setYear(year: int) + getDay () : int + getMonth () : int + getYear () : int + increment(); + decrement + getMaxDay (month: int) : int + Display() + Read()

TestDate
+ main()

Here is a sample run:

<pre>----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/1/2001 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 4 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:31/12/2000 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 3 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/1/2001 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 2 Enter day, month, year 1 3 2020</pre>	<pre>----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/3/2020 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 4 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:28/2/2020 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 3 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/3/2020 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 5 Thanks Goodbye!</pre>
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## Another sample run

<pre>----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/1/2001 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: : 2 Enter day, month, year 30 2 2020 ERROR: month 2 cannot be 30 days ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/1/2001 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 2 Enter day, month, year 1 1 0 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/1/0 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 4 ERROR: year cannot be negative</pre>	<pre>----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 1 Date:1/1/0 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 2 Enter day, month, year 0 2 2020 ERROR: Day cannot be less than 1 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 2 Enter day, month, year 0 0 2020 ERROR: Day cannot be less than 1 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 2 Enter day, month, year 1 0 2020 ERROR: Month cannot be less than 1 ----- Please choose from the following options: 1- Display the date 2- Change the date 3- Increment the date 4- Decrement the date 5- Exit ----- Enter your option: 2 Enter day, month, year 1 13 2020 ERROR: Month cannot be greater than 12</pre>
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