Object Oriented Programing Lab

BSCS(Fall 2015)

Lab # 4

Friday , march 18, 2016

Instructions: For support and guidance you can CONTACT ME AND TA's. Discussion with peers is strictly prohibited.

Task #1:

Create a class **Time** and a driver program that tests the class. The class definition contains prototypes for member functions **Time, setTime, printUniversal** and **printStandard,** and includes private integer members hour, minute and second.

setTime:

A public function that declares three **int** parameters and uses them to set the time . Test each argument to determine whether the value is in range, and, if so, assign the values to the hour, minute and second data members. The hour value must be greater than or equal to 0 and less than 24, because universal time format represents hoursasintegersfrom0 to 23 (e.g., 1PMishour13and 11 PM is hour 23; midnight is hour 0and noonishour12). Similarly, both minute and second must be greater than or equal to 0 and less than 60.

printUniversal:

Function **printUniversal** takes no arguments and outputs the time in universal-time format, consisting of three colon-separated pairs of digits for the hour, minute and second. For example, if the time were 1:30:07 PM, function **printUniversal** would return 13:30:07.

printStandard:

Function **printStandard** takes no arguments and outputs the date in standard-time format, consisting of the hour, minute and second values separated by colons and followed by an AM or PM indicator (e.g., 1:27:06 PM). If the hour is 0 or 12 (AM or PM), it appears as 12; otherwise, the hour appears as a value from 1 to 11. The conditional operator can be used to determine whether AM or PM will be displayed.

Task#2:

Enhance class Time to demonstrate how arguments are implicitly passed to a constructor. In **task#1** the constructor initialized hour, minute and second to 0.But now constructor will receive 3 int values as input parameters (default values equal to 0) and will set values to hour, minute and second respectively by calling **setTime** function in constructor. **setTime** functions should further call 3 setter functions **setHour**, **setMinute** and **setSecond** functions to **validate** and assign values to the data members. **printUniversal** and **printStandard** will call getter functions **getHour**, **getMinute** and **getSecond.**

Task#3:

Modify the Time class of **Task#2** to include a tick member function that increments the time stored in a Time object by one second. Write a program that tests the tick member function in a loop that prints the time in standard format during each iteration of the loop to illustrate that the tick member function works correctly. Be sure to test the following cases:

a) Incrementing into the next minute.

b) Incrementing into the next hour.

c) Incrementing into the next day (i.e.,11:59:59 PM to 12:00:00 AM).

Task#4:

Read and understand Article 9.10 “Default Member-wise Assignment “ from page 405 “C_Plus_Plus_How_to_Program_8th_Edition_Paul_Deitel_Harvey_Deitel” . Then Modify the Date class of to perform error checking on the initializer values for data members month, day and year. Also, provide a member function **nextDay** to increment the day by one. Write a program that tests function **nextDay** in a loop that prints the date during each iteration to illustrate that **nextDay** works correctly. Be sure to test the following cases:

a) Incrementing into the next month.

b) Incrementing into the next year.