การทดลองที่ 4

Chapter 9 Objects and Classes

Program # 1 (Exercise 9.2 The Stock class) Following the example of the Circle class in Section 9.2, design a class named Stock that contains:

- A string data field named symbol for the stock's symbol.
- A string data field named name for the stock's name.
- A double data field named previousClosingPrice that stores the stock price for the previous day.
- A double data field named currentPrice that stores the stock price for the current time.
- A constructor that creates a stock with the specified symbol and name.
- A method named getChangePercent() that returns the percentage changed from previousClosingPrice to currentPrice.

Draw the UML diagram for the class and then implement the class. Write a test program that creates a Stock object with the stock symbol ORCL, the name Oracle Corporation, and the previous closing price of 34.5. Set a new current price to 34.35 and display the price-change percentage.

```
Symbol: ORCL
Name: Oracle Coperation
Previous Closing Price: 34.5
Current Price: 34.35
Price Change: -0.434782608695648%
```

Program # 2 (Exercise 9.5 Use the GregorianCalendar class) Java API has the GregorianCalendar class in the java.util package, which you can use to obtain the year, month, and day of a date. The no-arg constructor constructs an instance for the current date, and the methods get(GregorianCalendar.YEAR), get(GregorianCalendar.MONTH), get(GregorianCalendar.DATE) and get(GregorianCalendar.DAY_OF_WEEK) return the year, month, date, and day of week. Write a program to perform two tasks:

- Display the current year, month, and date.
- The GregorianCalendar class has the setTimeInMillis(long), which can be used to set a specified elapsed time since January 1, 1970. For example, set the value to 1234567898765L resulting that Year is 2009, Month is 1 and Date is 14.
- Display calendar details by using method getTime() after specified the elapsed time in millisecond of one day after current day.

```
Current year, month, date, and day of week
Year is 2021
Month is 0
Date is 31
Day of week is 1
------------
After specified the elapsed time of one day after current day
Year is 2021
Month is 1
Date is 1
Day of week is 2
Mon Feb 01 16:59:20 ICT 2021
```

Program # 3 (Exercise 9.6 Stopwatch) Design a class named StopWatch. The class contains:

- Private data fields startTime and endTime with getter methods.
- A no-arg constructor that initializes startTime with the current time.
- A method named start() that resets the startTime to the current time.

- A method named stop() that sets the endTime to the current time.
- A method named getElapsedTime() that returns the elapsed time for the stopwatch in milliseconds.

Draw the UML diagram for the class and then implement the class. Write a test program that measures the execution time of sorting 1,000 numbers using selection sort and measures the executing time of creating 1,000 palindrome prime numbers.

```
Creating a list containing 1000 elements,
    209.12    278.55    699.92    109.04    723.90
    359.99     89.45    738.53    901.63    241.19
    ...
    912.00    822.75    803.12    262.73    271.37
    443.87    261.36    561.80    508.16    845.70
List created.
Sorting stopwatch starts...
      1.58      2.33      3.59      4.87      5.02
      5.28      6.27      7.43      9.92      9.96
      ...
    996.89    998.85    998.96    998.97    999.70
Sorting stopwatch stoped.
The sort time is 196.0 milliseconds.
------------------------------------------------------------
The palindromPrime stopwatch starts...
Creating 1000 PalindromPrime...
2 3 5 7 11 101 131 151 181 191
313 353 373 383 727 757 787 797 919 929
10301 10501 10601 11311 11411 12421 12721 12821 13331 13831
13931 14341 14741 15451 15551 16061 16361 16561 16661 17471
17971 18181 18481 19391 19891 19991 30103 30203 30403 30703
30803 31013 31513 32323 32423 33533 34543 34843 35053 35153
35353 35753 36263 36563 37273 37573 38083 38183 38783 39293
70207 70507 70607 71317 71917 72227 72727 73037 73237 73637
74047 74747 75557 76367 76667 77377 77477 77977 78487 78787
78887 79397 79697 79997 90709 91019 93139 93239 93739 94049
PalindromePrime created.
The palindromPrime stopwatch stoped.
The palindromPrime time is 1366.0 milliseconds.
```
