

Homework 7

Assigned: Monday, Jul 14, 2008

Due: 10:59PM, Wednesday, Jul 16, 2008

Points: 100 + (20 extra points)

[Instruction]

- Refer to Chapters 3 and 7 for this homework
- To add the Header with pledge, follow the instructions in the web page: <http://www.cs.unc.edu/~zlj/comp110/assignments.html>
- There are two parts of this assignment. The first part is written assignments. The second part is programming assignments.
- You need to turn in your writing assignments and your programs using Blackboard by 10:59PM, Jul 16, 2008. You also need to demonstrate the program to the instructor. There are two timing slots for demonstration:
 - Jul 17, after the class (11:15AM)
 - Jul 17, office hours (1PM-3PM)

[Grading of the Programming Assignments]

- Compile? (20%)
- Runs as expected? (70%) (correct input/output)
- Readability (comments in your programs) (10%)

[20 pts] I. Written Assignments

- Chapter 3, Page 171, Ex. 2
- Chapter 3, Page 171, Ex. 6, Explain why.
- Consider the following static method `duplicate()` below.

```
public static String duplicate(String s) {  
    String t = s + s;  
    return t;  
}
```

What does the following code fragment print out? Explain why.

```
String s = "Hello";  
s = duplicate(s);  
String t = "Bye";  
t = duplicate(t);  
System.out.println(s + t);
```

[30 pts] **Counting the Vowels**

Write a program that prompts the user to input a sequence of characters and outputs the number of vowel. You must **write** and **use** the following method:

- `isVowel`: This method is a value-returning method. It returns the value true if a given character is a vowel, and otherwise returns false.

[50 pts] **A Mini Paint**

Write a program that outputs a text menu:

T Triangle - Draw Triangles
S Square - Draw Square
? Help - Get Help
C Copyright - Copyright of the Program
Q Quit - Leave the Program

- When the user enters T, it will prompt the user to input an integer N . Then program outputs a triangle as the following with N rows. In this example, the user enters 3, so it outputs a triangle with 3 rows;

```
@  
@ @  
@ @ @
```

- When the user enters S, the program prompts the user to input an integer. Then program outputs a square with N by N as the following. In this example, the user enters 2, so it outputs a 2 by 2 square;

```
##  
##
```

- When the user enters ?, the program outputs a short description of this program. The program then terminates.
- When the user enters C, the program outputs the copyright of this program. The program then terminates.
- When the user enters Q, the program then terminates;
- Otherwise, output the error message. The program then terminates.

You must **write** and **use** the following methods:

- `Menu`: this method prints the menu
- `DrawTriangle`: this method prints the triangles composed by @
- `DrawSquare`: this method prints the squares composed by #
- `Help`: this method outputs a short description of this program
- `Copyright`: this method prints the copyright of this program

[Extra credit: 20pts]

Modify your program so that it terminates only if the user has entered Q. Otherwise, the program just prints the output according to what the user entered. Then the program shows the menu again, and prompt the user to enter another input.