ComS 207: Programming I
Homework 5
Out: Wed. Feb 15, 2006
Due: Fri. Feb 24, 2006 (*BEFORE* the start of class)

Student Name:

Recitation Section:

All of these problems came from your textbook. The text is reproduced here for your convenience.

1. **Review Questions**

   [**Exercise 5.1**] What happens in the MinOfThree program if two or more of the values are equal? If exactly two of the values are equal, does it matter whether the equal values are lower or higher than the third?

   [**Exercise 5.2**] What is wrong with the fallowing code fragment? Rewrite it so that it produces correct output.

```
if (total ==  MAX)
    if (total < sum)
        System.out.println("total ==MAX and is , sum.");
else
    System.out.println ("total is not equal to MAX");
```

[**Exercise 5.3**] What is wrong with the fallowing code fragment? Will this code compile if it is part of an otherwise valid program? Explain.

```
if (length = MIN_LENGTH)
    System.out.println("The length is minimal.");
```

[**Exercise 5.4**] What output is produced by the fallowing code fragment?

```
int num = 87, max = 25;
if (num >= max*2)
     System.out.println("apple");
     System.out.println("orange");
System.out.println("pear");
```

[**Exercise 5.5**] What output is produced by the fallowing code fragment?

```
int limit = 100, num = 15, num2 =40;
if (limit <= limit)
{
    if (num1 ==num2)
        System.out.println("lemon");
    System.out.println("lime");
 }
 System.out.println("grape");
```

2. **Programming Projects**

Choose ***three of the following five*** programming projects and implement them. Your grade will NOT depend on which ones you choose. Just puck the ones that you like.

[**Programming Project 5.1**] Design and implement an application that reads an integer value representing a year from the user. The purpose of the program is to determine if the year is a leap year (and therefore has 29 days in February) in the Gregorian calendar. A year is a leap year if it is divisible by 4, unless it is also divisible by 100 but not 400. For example, the year 2003 is not a leap year, but 2004 is. The year 1900 is not a leap year because even though it is divisible by 100, but the year 2000 is a leap year because even though it is divisible by 100, it is also divisible by 400. Produce an error message for any input value less than 1582(the year the Gregorian calender was adopted).

[**Programming Project 5.16**] Design and implement an application that plays rock-paper-scissors game against the computer. When played between two people, each person picks one of three options(usually shown by hand gesture) at the same time, and the winner is determined. In the game, Rock beats Scissors, Scissors beats paper, and Paper beats Rock. The program should randomly choose on of the three option(without revealing it), the prompt for a user's selection. At that point, the program reveals both choices and prints a statement indication if the user won, the computer won, or if it was a tie. Continue playing until the user chooses to stop, then print the number of user wins losses, and ties.

[**Programming Project 5.18**] Design and implement an application that simulates a simple slot machine in which three number between 0 and 9 are randomly selected and printed side by side. Print an appropriate statement if all three of the number are the same, or if any two of the number are the same. Continue playing until the user chooses to stop.

[**Programming Project 5.33**] Modify the Account class from Chapter 4 so that it performs validity check on the deposit and withdraw operations. Specifically, don't allow the deposit of a negative number or a withdraw that exceeds the current balance. Print appropriate error messages if these problems occur.

[**Programming Project 5.41**] Design and implement a class called Card that represents a standard playing card. Each card has a suit and face value. Create a program that deals 5 random cards.

3. *** For Advanced (or Bored) Students Only!**

   [**Programming Project 5.38**] Design and implement a program that counts the number of punctuation marks in a text input file. Produce a table that shows how many times each symbol occurred.

   Hint: You can limit the code to only counting the following signs: '.', ',', '!', '?', and ';'.

4. **What to Submit**

   Print pages 1-3 of this assignment. Write your name and recitation section on the top of the printout. For part 1 write your answers on the printout. For part 2 submit three additional printouts, one for each of the three programs that you chose to write. The printouts should represent complete programs, not just snippets of code. If you choose to do part 3 submit a printout for it as well.

   Also, for part 2 (and 3 if you chose to do it) submit your code electronically using WebCT. The procedure will be explained during the recitation sessions.

   Submit your homework *BEFORE* the start of class on Friday, Feb 24.

   IMPORTANT: Staple all of your printouts together. We are not be responsible for finding missing or misplaced pages.

   IMPORTANT: Once again, no late homeworks will be accepted.

That's it. Good Luck!