CS1073 Assignment #6 - Fall 2012

Due: Friday, Nov. 23, 2012 by Noon in the appropriate assignment bin.

The purpose of this assignment is to practice with loops and arrays.

Question 1: Team Roster

RosterTest.java is available with this assignment via Desire2Learn. Write a TeamRoster class so all the test cases in RosterTest perform correctly.

TeamRoster includes an array of String values, where each array element stores the name of one person on the team. The array is full – one name in every array element.

The constructor receives an array of names as the single parameter. The length of the instance variable array is determined by the length of this parameter array. The constructor copies each String from the parameter to the instance variable, making a new copy of the entire array.

Executing RosterTest should result in the following output:

```
TeamRoster[Spassky, Fischer]
TeamRoster[Charles, Larry, Michael, Earvin, Patrick]

Correct - Michael didn't want Zeke on the team.
Correct - They had to have Larry Legend.
Correct - These two names are different.
Correct - null returned for invalid index.
Correct - Player was replaced.
Correct - The Admiral is now playing Center.
Correct - Player was not replaced.
```

Question 2: Random Die Rolling

Write a class with a main method that simulates randomly rolling a die some number of times. The number of sides on the die and the number of rolls are both entered by the user. Count the number of times each side of the die is rolled, then display the results with two histograms – one horizontal and one vertical. Below is sample output from executing the program a couple of times. Your output should match this format exactly, which means:

- Use - and + characters for the horizontal histogram, and | and + characters for the vertical histogram. In both cases, print + for every fifth item in a particular bar.
- You can assume the column numbers will be at most two digits. Insert a space in front of single-digit numbers for the horizontal histogram. Display the numbers vertically as shown for the vertical histogram, including leading zeroes for numbers less than 10.
- Separate the numbers from the histogram bars. Use) for the horizontal histogram, and a row of dashes for the vertical histogram, as shown.

Notice that for each program execution the exact same counts are represented by the two histograms. The only array required for this program is a one-dimensional array of counts.

Hand in output for the two test cases shown below. Since the numbers randomly generated, your histograms will of course show different results, but in the same format.

```
How many sides on the die? 6

How many rolls? 10

 1)
 2) ----
 3)
 4) --
 5) -
 6) ---

 |
 |   |
 | | |
 | |||
------
000000
123456
```

(See the next page for the second example…)

```
How many sides on the die? 12

How many rolls? 100

 1) ----+--
 2) ----+--
 3) ----+----+-
 4) ----+--
 5) ----+----
 6) ----+
 7) ----+-
 8) ----+-
 9) ----+----+----+
10) ----+----+
11) ----+---
12) ----+----

        +
        |
        |
        |
  |     |
  +     ++
  | |   || |
  | |   ||||
|||||   ||||
||||| ||||||
++++++++++
||||||||||
||||||||||
||||||||||
||||||||||
----------
000000000111
123456789012
```

Question 3: A 2D array of sales figures

Write a java program called Sales2D that creates a randomly generated two-dimensional array of sales figures. First ask the user how many weeks worth of sales data are desired, then create a 2D array to type int to hold 7 sales amounts per week, where each week's worth of data forms one row in the array. Thus the array has one row for each week and 7 columns. Each entry in the array is a monetary amount stored in pennies, so the number 123456 represents $1,234.56. Fill the array with randomly generated data, where each sales figure is between $1,000.00 and $5,000.00 inclusive. Display your array as a 2D table, using NumberFormat to format the values as currency, and right-aligning each column of data. You may include row and column headings if you wish, but this is not a requirement.

Once your array is fully populated with numbers, use another set of loops to answer the following question: What is the row index for the week with the highest average sales, and what is the average sales for that week?

Hand in output for three sample runs:

- 1 week's worth of data
- 3 week's worth of data
- 10 week's worth of data

What to hand in to the assignment bin:

All source code you wrote for questions 1, 2, and 3, plus output for all of the test cases described above. There is no need to hand in RosterTest.java

As usual, your submission should have the standard signed CS1073 cover page attached to the front, and it should be stapled in the top-left corner (with the pages assembled in the proper order).

End of Assignment 6
