CS1341 – Lab #4

Due Saturday 03/12/2022 at 6:00 am

PRE-LAB [5 points]
Must be done prior to your lab session and brought to your lab class to be graded.

First, read the instructions for the first two problems – "Roll Dice" and "Spin a Compliment". Create files containing the class and main method headers for each of these classes. Add import statements that are required and create a Scanner and Random objects as the first two statements in the main method of each of these programs.

Show the the *.java* source files to your lab instructor at the beginning of lab class to get pre-lab credit.

Grading Rubric

NOTES: Use the given notes as a guide for the program logic. These comments must be included in the programs to explain the logic followed. Each program should compile without errors and should run to produce outputs described for each exercise.

The following points will be discounted if the related element is missing or incorrect:

- Proper output formatting [20 points]
- Proper names for classes and variables [15 points]
- Comments [15 points]
- Program doesn't compile [5 points for each minor error up to 5 errors provided that after fixing the errors the program compiles. If the program does not compiler after the 5 errors are fixed, partial credit will be given not to exceed 50 points]
- Source code (java file) missing [15 points each]
- Executable (class file) missing [15 points each]
- All java files and class files missing [90 points]

Plagiarism or collaboration with anyone other than your professor, lab instructor, or CS help desk personnel will result in no credit for the assignment and possible honor code violation. Plagiarism is inclusion of any line of code that was created by another person, regardless of the source.

[20 points] Roll Dice

This small Java program prompts the user to press Enter/Return to roll two dice. The values of each die is displayed, along with a notification if the player rolled doubles.

Instructions

Use the Scanner and Random library classes in java.util for this program. No loop is required, so the program exits after one roll of the pair of dice.

Hint: use the *nextLine()* method with the Scanner to support the "Press Enter to roll the dice..." requirement.

Sample Output

User entries highlighted in yellow

```
> java RollDice
Press Enter to roll the dice...
Rolled 1 and 5
> java RollDice
Press Enter to roll the dice...
Rolled 4 and 2
> java RollDice
Press Enter to roll the dice...
Rolled 5 and 2
> java RollDice
Press Enter to roll the dice...
Rolled 3 and 3  - doubles!!
> java RollDice
Press Enter to roll the dice...
Rolled 4 and 6
```

[20 points] Spin A Compliment

This Java program uses an array with (at least) five Strings containing compliments. Prompt the user to press Enter/Return to spin the compliment wheel, and use java.util.Random to generate a random index number from the array and display the compliment at that location in the array.

Instructions

Use the Scanner and Random library classes in java.util for this program. No loop is required, so the program exits after one spin of the compliment wheel.

Hint: use the *nextLine()* method with the Scanner to support the "Press Enter spin..." requirement.

Sample Output

User entries highlighted in yellow

```
> java SpinACompliment
Press Enter to spin the compliment wheel...
You're swell!
> java SpinACompliment
Press Enter to spin the compliment wheel...
You..are...amazing!
> java SpinACompliment
Press Enter to spin the compliment wheel...
You..are...amazing!
> java SpinACompliment
Press Enter to spin the compliment wheel...
You are so fun!
```

[25 points] Roll and Spin

This program reuses the code you created in the previous two problems (RollDice and SpinACompliment) to allow the user to repeatedly choose to Roll, Spin, or Exit. The loop containing the user prompt should be in the main method, and roll Dice and spin a compliment should each be in their own separate method that is called from main. The variables containing the Scanner and Random objects should be declared as static outside the main method so they can be used in all three methods.

Pseudocode

import statements
RollSpin class

Declare and create a Scanner as static.
Declare and create a Random as static.

main method

Within a loop, prompt the user to Roll, Spin, or Exit. Repeat until the user chooses Exit. (Hint: Do not use == to compare Strings)
- If the user chooses Roll, call the rollDice method
- If the user choose Spin, call the spinACompliment method
- If the user chooses Exit, break out of the loop end end the program

rollDice method

Reuse the code you created in the RollDice problem

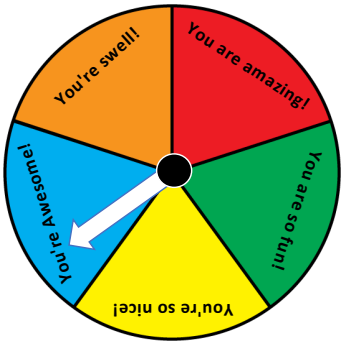
spinACompliment method

Reuse the code you created in the SpinACompliment problem

Sample Output

User entries highlighted in yellow

```
> java RollSpin
Roll, Spin, or eXit? (R/S/X) s
  Press Enter to spin the compliment wheel...
  You are so fun!
Roll, Spin, or eXit? (R/S/X) s
  Press Enter to spin the compliment wheel...
  You're swell!
Roll, Spin, or eXit? (R/S/X) r
  Press Enter to roll the dice...
  Rolled 5 and 4
Roll, Spin, or eXit? (R/S/X) r
  Press Enter to roll the dice...
  Rolled 1 and 3
Roll, Spin, or eXit? (R/S/X) r
  Press Enter to roll the dice...
  Rolled 3 and 3 - doubles!!
Roll, Spin, or eXit? (R/S/X) r
  Press Enter to roll the dice...
  Rolled 6 and 2
Roll, Spin, or eXit? (R/S/X) x
```



[30 points] Array Fun

This problem includes a looping menu, creation and modifying an array of doubles, and multiple methods (including passing an array from one method to another.) Follow the pseudocode below to match the sample output.

Pseudocode

import statement
ArrayFun class

main method

Declare and create a Scanner.

Print a welcome message and orompt for the size of the *double* array.

Declare and create a double array of the specified size and prompt user to enter its values.

Within a loop, display a menu with the four options shown in the sample output. Repeat until the user chooses Exit.
- Option 1 should pass the array to the *printArray* method
- Option 2 should pass the array to the *doubleArray* method
- Option 3 should pass the array to the *squareArray* method
- Option 4 should break out of the loop and end the program

printArray method

Loop through the array passed to this method and print each of the double values it contains across one row, formatted as shown in the sample output with a space between each value.

doubleArray method

Loop through the array passed to this method and double each of its values.

doubleArray method

Loop through the array passed to this method and square each of its values.

Sample Output

User entries highlighted in yellow

```
> java ArrayFun
Welcome to Array Fun!

How many values would you like in your array? 5
Enter a floating point value #1: 2.2
Enter a floating point value #2: 3.3
Enter a floating point value #3: 4.4
Enter a floating point value #4: 5.5
Enter a floating point value #5: 6.6

Options
1. Print array contents
2. Double array contents
3. Square array contents
4. Exit

Enter choice: 1

The values are: 2.20 3.30 4.40 5.50 6.60

Options
1. Print array contents
2. Double array contents
3. Square array contents
4. Exit

Enter choice: 2

Options
1. Print array contents
2. Double array contents
3. Square array contents
4. Exit

Enter choice: 1

The values are: 4.40 6.60 8.80 11.00 13.20

Options
1. Print array contents
2. Double array contents
3. Square array contents
4. Exit

Enter choice: 3

Options
1. Print array contents
2. Double array contents
3. Square array contents
4. Exit

Enter choice: 1

The values are: 19.36 43.56 77.44 121.00 174.24

Options
1. Print array contents
2. Double array contents
3. Square array contents
4. Exit

Enter choice: 4
```