Objectives:
Practice using arrays to store and process values of different types.

a) Preparation: Array exercise
See http://www.csc.villanova.edu/~map/1051/s15/08arrayExercise.pdf

- Demonstrate your work ________________________________

b) An array of double
Make a new version of your program from part (a) and name it Lab11b.java
This program should create an array of 100 values of type double, set to random values in the range 0….1.
- What happens if you do not initialize the array’s values?

Answer: ___________________________________________________________________________________

c) An array of boolean
Create a new version of your program Lab11c.java that creates instead an array of 100 values of type boolean. The values should be set to alternating true/false, i.e., anArray[0] = true; anArray[1] = false, etc. (be sure to use a loop here too).
- What happens if you do not initialize the array’s values?

Answer: ___________________________________________________________________________________

d) An array of char
Create a new version of your program Lab11d.java that creates instead an array of 26 values of type char. The values should be set to the letter ‘a’ … ‘z’.
- What happens if you do not initialize the array’s values?

Answer: ___________________________________________________________________________________

e) Reading values from the user and storing them in an array
Starting from Lab11b.java (array of double) create a new version of your program Lab11e.java, that uses Scanner to input values from the user. (Test it with smaller arrays, say with 5 entries, so you don’t need to type so much.)
f) An array of String
Create a new version of your program `Lab11f.java` that creates an array of 52 Strings to represent a deck of playing cards, as follows:

1) Create an array of 4 Strings to represent the **suits**: “hearts”, “spades”, “diamonds”, “clubs”

2) Create another array of 13 Strings to represent the **ranks**: “2”, “3”, ..., “10”, “Jack”, “Queen”, “King”, “Ace”

3) Now use the above two arrays to create a third array of 52 Strings to represent the actual **deck**. The deck will consist of Strings like “4 of hearts” or “King of clubs”, i.e., a rank, followed by the string “of” followed by a suit. **Hints:**
   - use a nested loop to combine each rank with each suit in the manner described (i.e., for each suit, for each rank, make a string consisting of these components)
   - set up a counter to index the array, so that each of these combinations gets stored consecutively as one of the 52 array elements representing the deck.

As with previous versions, be sure to print out the elements of the array at the end.

4) Shuffle the deck as follows:
   - Pick two cards at random (do this by generating two random numbers `a` and `b` in the range 0..51).
   - Exchange the values (Strings) in `deck[a]` and `deck[b]`.
   - Repeat many, many times (how many do you think would be enough?)

After the deck is shuffled, print it again and behold the cards in random order!

g) Expand your knowledge of arrays and all things Java
The array exercise example is from the Java online tutorials:
[http://docs.oracle.com/javase/tutorial/java/nutsandbolts/arrays.html](http://docs.oracle.com/javase/tutorial/java/nutsandbolts/arrays.html)

- Read the tutorial on arrays. This is one of many online tutorials that are available on Java programming. As you progress to writing Java programs to solve real life problems (or to review for final exam...), it is useful to know where to go to brush up on a topic or to learn more about the intricacies of the Java language.
- Make a note here about something that you learned.

Answer: ________________________________________________________________