CS-141 Basic Array Problems

1. Declare and create an array of 50 integers called myNums where the $i^{th}$ element has the value $2i$.
2. Print the values of myNums using each of the following methods
   a. the Arrays class
   b. a for-loop
   c. an enhanced for-loop.
3. Compute the average of all of the elements of myNums.
4. Print out all the elements of myNums which are divisible by 4.
5. Declare and create a 2D array of doubles called cells with 4 rows and 8 columns. Set the value of each element of cells to be equal to the product of its row and column.
6. What type of variable is cells? What type is cells[2]? What type is cells[1][2]?
7. What is the value of cells.length? What is the value of cells[2].length? Does cells[2][3].length make any sense? Why or why not?
8. Compute and print the average of the values in each row of cells.
9. Compute and print the average of the values in each column of cells.
10. Compute and print the average over all the values in cells.
11. Suppose you are writing a solitaire card game which begins with 7 piles of cards aligned in a row. The $i^{th}$ pile contains $i+1$ cards. Create a 2D array to represent these cards. Set the value of each card randomly to a value in the range 0 to 51.
12. Write a method that takes a card (i.e. number 0 to 51) and prints the card’s name. Use arrays to store the names of the suits (Diamonds, Hearts, ...) and the names of the face cards (Ace, 1, 2, ...).
13. Use your method above to print out the 7 piles of cards, e.g.
   
   ```java
   Pile 0:
   Ace of Hearts
   3 of Clubs
   Jack of Diamonds
   
   Pile 2:
   ...
   ```

14. Declare and create an ArrayList of Strings called animals.
   a. Add animal names to the list (e.g. ant, aardvark, cat, crow, snake, dog, zebra, cheetah, coyote, duck, dingo, deer).
   b. Use a loop to print out the resulting elements in the animals.
   c. Use a loop to remove all animals whose names begin with 'a' or 'c'.