ISD Week 4 Lab

1. Write a program that asks the user to input 10 integers and then prints three lines of output, containing:

   first line: Every element at an even index i.e. at index 0, 2, 4, ...
   second line: Every element that is an even number
   third line: All elements in reverse order

   Write and use three **methods** to carry out each of these tasks. The methods should do their own printing and have a return type **`void`**

2. Write a program that asks the user to input a sequence of numbers, ending with Q, and that computes and outputs the *alternating sum* of the numbers (you may assume that no more than 100 numbers will be entered). For example, if the input is:

   4 5.3 6.7 2 0 -1 7

   then your program needs to compute and output the value of

   4 **−** 5.3 **+** 6.7 **−** 2 **+** 0 **−** (-1) **+** 7

   Write and use a method that takes an Array of doubles, and computes and returns the alternating sum of the values in the array.

3. Write a program that asks the user to input a sequence of numbers, ending with Q, and that computes and prints out the reverse of this sequence (you may assume that no more than 100 numbers will be entered). For this program, write and use a method that takes an Array of doubles (which might only be partially filled) and returns an Array of doubles that has the same contents but in reverse order.

4. Repeat 2 but this time using an ArrayList rather than an Array.

5. Repeat 3 but this time using ArrayLists rather than Arrays.

6. Write a program that asks the user to input a sequence of numbers, ending with Q, and that prints them out again but with any duplicates removed. For this program, write and use a method that takes an ArrayList of Doubles and returns an ArrayList that has the same contents but with the duplicates removed. For example, if the array list passed to the method contains the numbers

   4 9.5 16 9.5 7.2 4 9.5 11

   then the array list returned by the method should contain the numbers

   4 9 16 7.2 11

   Hint: use a **while** loop to traverse the array list, and another **while** loop nested within it to check and remove duplicate occurrences of the current element. Don't use **==** to compare two elements of the array list (because this will compare their *references*, as **Double**s) but instead use the **equals** method to compare their contents, as **double**s. (Remember from Week 2 that this is what we needed to do for comparing two **String**s too).