Lab 11 – ArrayLists

In this lab, you will work with Java's **ArrayList** class. An ArrayList is a collection structure in Java. I gives you a list of items (objects) that are similar to each other. The **ArrayList** class has the following methods which you can use:

add(E element)	E remove(int index)	E get(int index)	boolean isEmpty()
add(int index, E element)	clear()	E set(int index, E element)	int size()

You can check the Java documentation for more detailed description of these methods.

a. Create a new project in java named `Lab10_lastName_firstName`. In this project, create a new class called `ArrayList1`.

b. In the main method, define an `ArrayList` of Strings called "friends" (or "enemies" if you prefer). Remember that you need to `import java.util.*`.

c. Add a friend to this list by entering your friends name as an argument to the `add` method above. Note that because you are entering a string, your friend's name should be in quotes. Print the contents of this list by including the code:

```
System.out.println(friends);
```

d. Populate this list further by requesting the user to enter 3 names. Print the contents of the list. Did you get what was expected?

e. Once successful, do some further work with the list and its methods:
   a. Add elements (Print out the list after each step so that you can see what happened. Hard code the values to add rather than reading them)
      i. Add a new element using `.add()` (where was it added? _____)
      ii. Add a new element at the beginning.
      iii. Add a new element at position 4. What index should you use?
      iv. Add a new element at position 10. What happened? Why did this happen?
   b. Before continuing, comment out any code you created above that caused an error.
   c. Print out how many elements are contained in the list. Make sure that you incorporate this into a meaningful statement.
   d. Using a standard for loop and an index method, print out all the names similar to the following:

      Friend 1: Fred
      Friend 2: Sam
      Etc.

   e. Using a special for-each loop, print out all the names similar to the following:

      Fred
      Sam
      etc.

Lab 11 – ArrayLists

f. Removing elements (Print out the list after each one so that you can see if you are successful)
    i. Remove the element at the beginning.
    ii. Remove the element in position 3.
    iii. Remove the last element.

g. Using a loop, print the first longest name in the list. (Hint: you can use `.length()` with String variables). You may want to create the algorithm for this first before attempting the solution.

Submit the entire folder to the submit drive in the usual way.