

Intro to ArrayLists

Task 1

Start a new project in your IDE and copy/paste the Main.java starter code.

Find the line of code that creates a new ArrayList of String objects and paste it here:

How many functions are called from `main()` //including commented ones?

Task 2

Run the program. Add the following names to the ArrayList, *players*.

"jack"	"jill"	"joe"	"jess"	"quit"

Write down the index of each String in the ArrayList in the table above.

The ArrayList family of code has a function (or method) which is used to **add** objects to a list. What is the name of this method?

Task 3

Uncomment the call to `addJeffAtIndex` in `main()`

This function will attempt to insert the String "Jeff" at the specified index.

Run the program more than once. *Note, you will need to add initial players to the list each time you run the program.*

*You should see that when we insert an object into a list at a specified index, all **subsequent objects** are shifted up to the next.*

You can also see that the function responsible for this has the same name as the function identified in Task 2. So, it is possible in Java to have more than one function with the same name as long as the parameter list is different:

```
add(object)
add(int, object)
```

This is known as **method overloading** and helps make code very flexible.

Adapt `addJeffAtIndex` so that if the String at the insertion index is already "jeff", then another "jeff" will not be inserted; otherwise it will. *Test your code to make sure it works as expected.*

Hint: try using:

```
String player = players.get(index); //get the String at index
if(!player.equals("jeff")){ //check it is not "jeff"
    //add "jeff" at given index
}
```

Task 4

Uncomment the call to `replaceJack` in `main()`.

This function will attempt to **replace** every instance of “jack” in the list with the second parameter eg “jasmine”.

Run the program and see if it works as expected. *Make sure you include some “jack” objects in the initial list.*

When determining the **length** of an array we use `.length`

When working with ArrayLists, what do we use instead?

What is the name of the String family of code function (or method) which allows us to replace an **object** and a given **index** in a list (include its parameter list data types)?

Task 5

Uncomment the call to `removeAllJills` in `main()`.

This function will iterate through a list and remove all instances of **“jill”** objects.

Run the program by adding the following players at the start and make sure the code works as expected:

“jack”	“jill”	“joe”	“jess”	“quit”
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Task 6

Repeat Task 5 but use this as the initial list. Remember, the program will finish by removing all instances of “jill”:

“jill”	“jill”	“jill”	“jill”	“quit”
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Did the program successfully remove all instances of “jill”. If not, why not?

Task 7

Fix the `removeJill` function so that it works as intended.

Task 8

Create a new function called `countJackAndJill`

This function will count the number of instances of “jack” and “jill” in a list and display the result.

Continue to exam style question

Exam Style Question

The following code exists:

Java

```
ArrayList<String> cities = new ArrayList<String>();

cities.add("Milan");
cities.add("Paris");
cities.add(0, "London");
cities.set(0, "Madrid");
cities.add("Rome");
cities.remove(2);

if(cities.get(2).substring(0,1).equals("M"){
    System.out.print("We are in Milan!");
}else{
    System.out.println("We are NOT in Milan!");
}
```

- a) Complete the table by writing the indexes and the String instances in the list after the code is executed. [1]

index	String

b) What will be displayed when the code is executed?

[1]

REVIEW

The following ArrayList functions (or methods) were introduced in this unit.

Make a note on which ones you feel you understand clearly.

function/method	notes
<code>.size()</code>	
<code>.get(int)</code>	
<code>.add(object)</code>	
<code>.add(int, object)</code>	
<code>.set(int, object)</code>	
<code>.remove(int)</code>	

SUBMIT THIS WORKSHEET AND YOUR .java FILE AS INSTRUCTED.