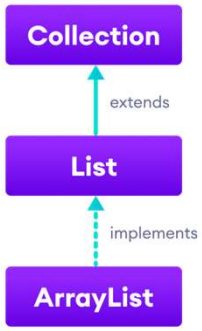
ArrayLists

(also known as Vectors or Lists)

Interactive Exercise

v102



by Dave Slemon, Mohawk College

Interactive Exercise on

ARRAYLISTS

Recommended:

Type and execute each of the answers one by one that are presented here.

Instructions for this Interactive Exercise on
ARRAYLISTS

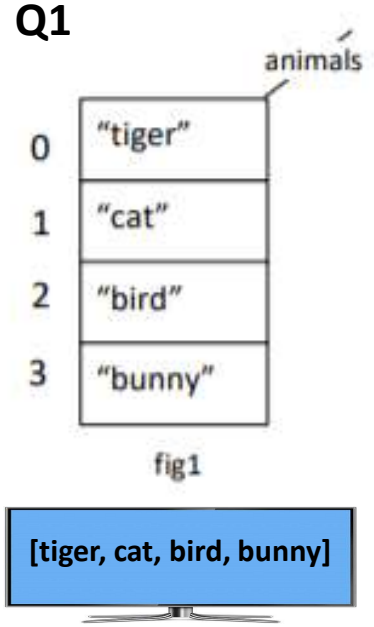
Remember to import the ArrayList library

import java.util.ArrayList;

…and if you plan on sorting your ArrayList include the Collections library

import java.util.Collections;

Q1



1. Create the animals list shown in fig 1 then display the arraylist to the screen

Q1

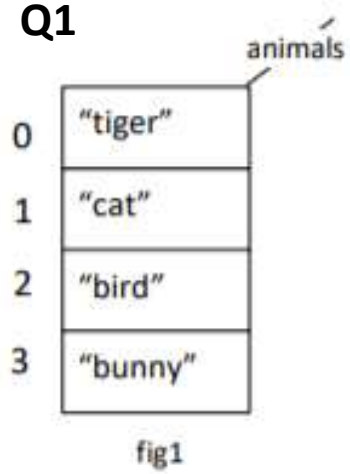


fig1

Video Screen

[tiger, cat, bird, bunny]

1. Create the animals list shown in fig 1.

```
ArrayList<String> animals = new ArrayList<String>();
//ArrayList<String> animals = new ArrayList<>();

animals.add("tiger“);
animals.add(“cat“);
animals.add(“bird“);
animals.add(“bunny“);
System.out.println( animals );
```

Q2

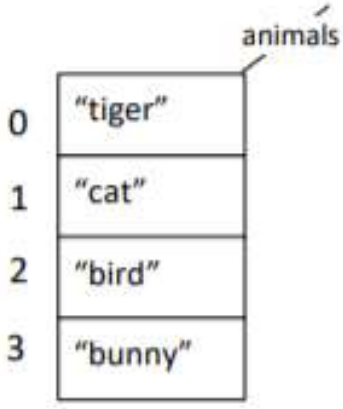


fig1

4. Delete the "bird" from the list, animals, of fig 1 so that the resulting list looks now look like the list shown in fig3

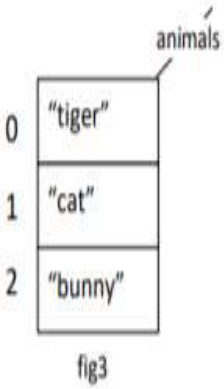


fig3

Q2

If multiple "birds" are in the array, this line only removes the first "bird"

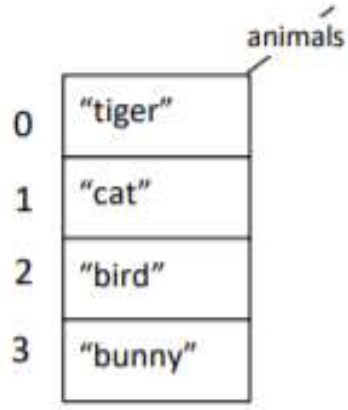


fig1

4. Delete the "bird" from the list, animals, of fig 1 so that the resulting list looks now look like the list shown in fig3

animals.remove("bird");

or

animals.remove(2);

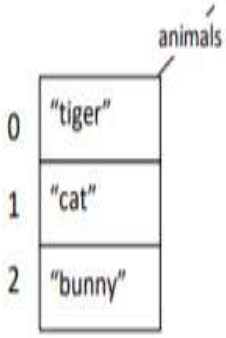


fig3

Q3

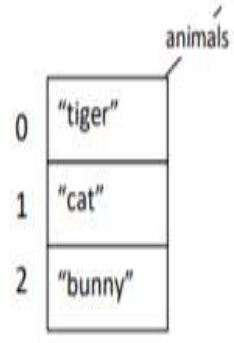


fig3

5. Add the animal stored in cage, to the list in fig3, so that the cage animal appears at index: 2 and the "bunny" appears at index: 3. See fig 4

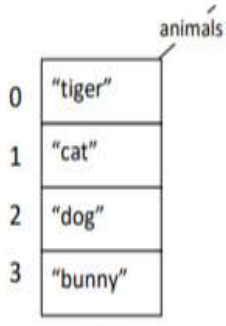


fig4

cage "dog"

fig2

Q3

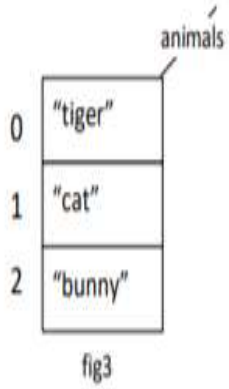


fig3

5. Add the animal stored in cage, to the list in fig3, so that the cage animal appears at index: 2 and the "bunny" appears at index: 3. See fig 4

animals.add(2,cage);

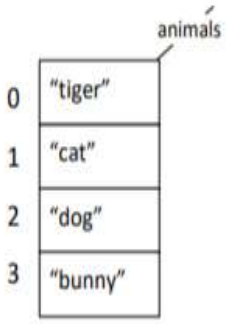


fig4

cage "dog"

fig2

Q4

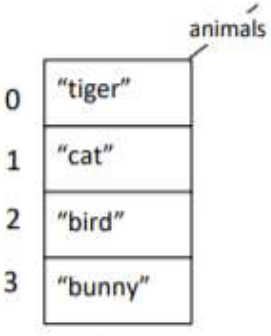


fig1

Display how many elements are contained in the array.

Q4

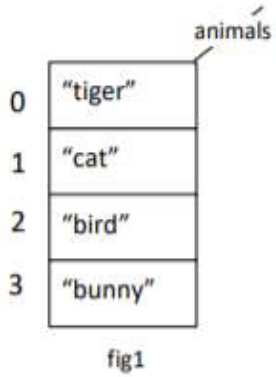


fig1

Display how many elements are contained in the array.

System.out.println(animals.size( ));

Q5

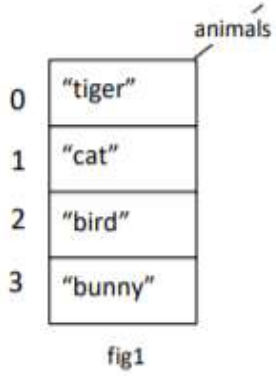
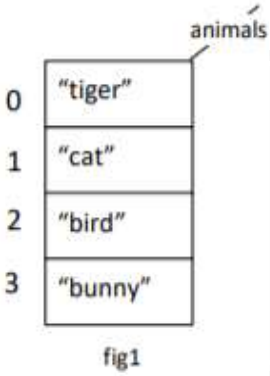


fig1

6. Using the list in fig1, display the following sentence:

The cat is chasing the bird

Q5

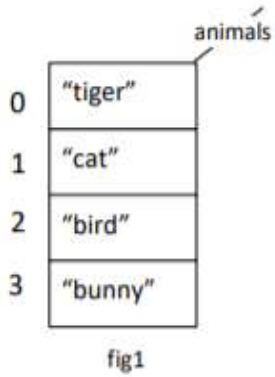


6. Using the list in fig1, display the following sentence:

The cat is chasing the bird

System.out.println("The " + animals.get(1) + " is chasing the "+ animals.get(2));

Q6



How do you delete all of the entries in the array using a single line?

Q6

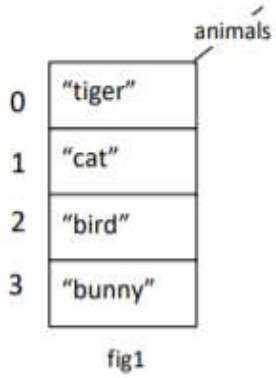


fig1

How do you delete all of the entries in the array using a single line?

animals.clear( );

or

animals.removeAll( );

Q7

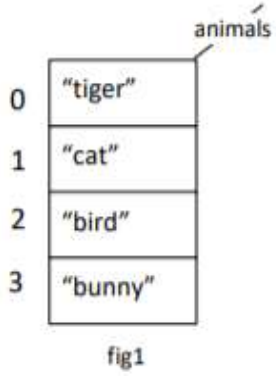
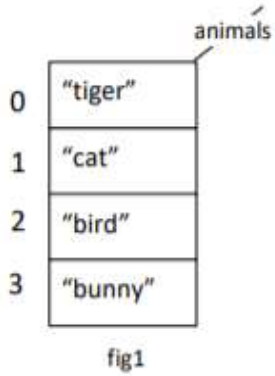


fig1

7. Using the list in fig1, display using a for loop each animal in order from index 0 to index 3
This is called, iterating over the list.

tiger
cat
bird
bunny

Q7

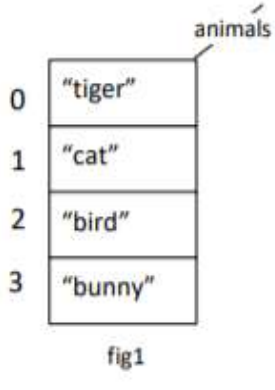


7. Using the list in fig1, display using a for loop each animal in order from index 0 to index 3
This is called, iterating over the list.

tiger
cat
bird
bunny

```
for (int i=0;
        i < animals.size();
        i++)
{
 System.out.println( animals.get(i) );
}
```

Q7



7. Using the list in fig1, display using a for loop each animal in order from index 0 to index 3
This is called, iterating over the list.

tiger
cat
bird
bunny

```
//enhanced for loop
for (String a : animals)
{
    System.out.println( a );
}
```

Q8

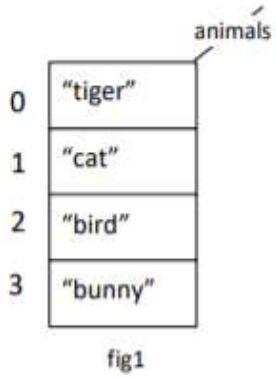


fig1

How to you transform your ArrayList from fig 1 to fig 4?

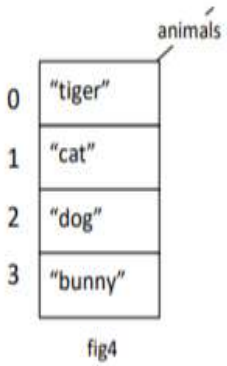


fig4

Q8

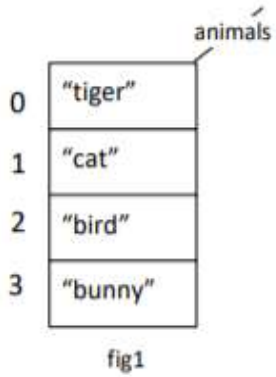


fig1

animals.set(2,"dog");

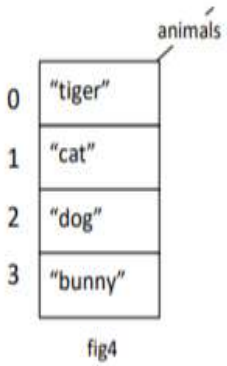


fig4

Q9 Sorting

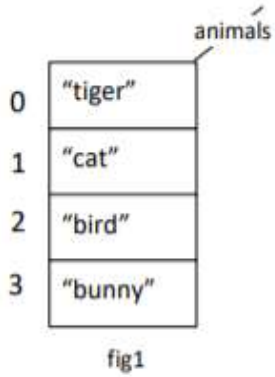


fig1

How to you sort the ArrayList?

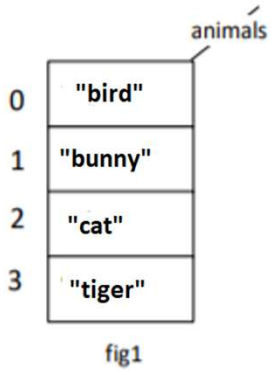


fig1

Q9 Sorting

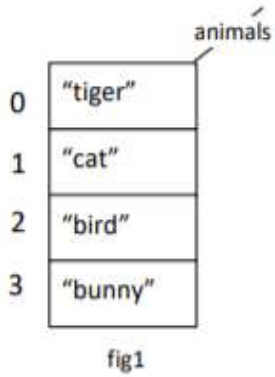


fig1

import java.util.Collections;

Collections.sort(animals);

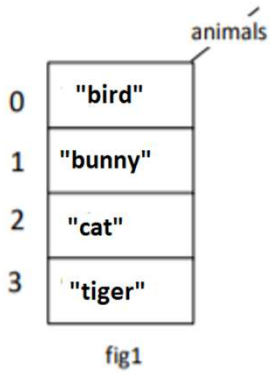


fig1

.clone method

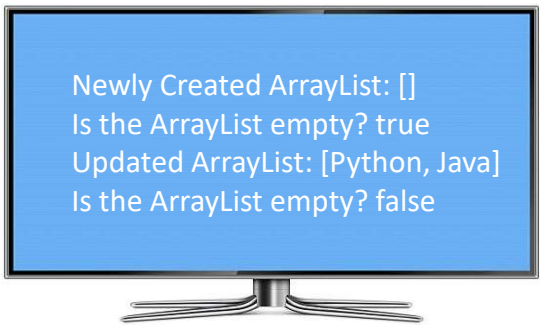
Creates a new arraylist with the same element, size, and capacity.

```
import java.util.ArrayList;

class Main {
   public static void main(String[] args){

      // create an arraylist
      ArrayList<Integer> number = new ArrayList<>();

      number.add(1);
      number.add(3);
      number.add(5);
      System.out.println("ArrayList: " + number);

      // create copy of number
      ArrayList<Integer> cloneNumber = (ArrayList<Integer>)number.clone();
      System.out.println("Cloned ArrayList: " + cloneNumber);
   }
}
```

.isEmpty( ) method

Checks if the arraylist is empty.

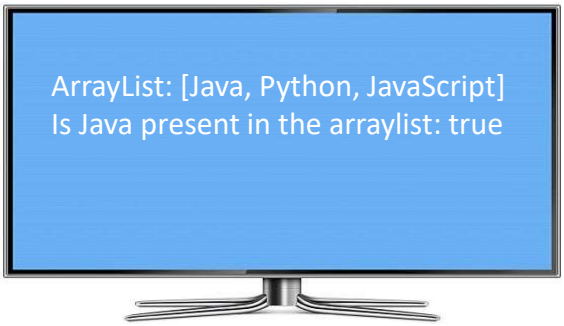
```
import java.util.ArrayList;

class Main {
   public static void main(String[] args) {
      // create an ArrayList
      ArrayList<String> languages = new ArrayList<>();
      System.out.println("Newly Created ArrayList: " + languages);

      // checks if the ArrayList has any element
      boolean result = languages.isEmpty(); // true
      System.out.println("Is the ArrayList empty? " + result);

      // add some elements to the ArrayList
      languages.add("Python");
      languages.add("Java");
      System.out.println("Updated ArrayList: " + languages);

      // checks if the ArrayList is empty
      result = languages.isEmpty();  // false
      System.out.println("Is the ArrayList empty? " + result);
   }
}
```



```
import java.util.ArrayList;

class Main {
  public static void main(String[] args) {
    // create an ArrayList
    ArrayList<String> languages = new ArrayList<>();
    languages.add("Java");
    languages.add("Python");
    languages.add("JavaScript");
    System.out.println("ArrayList: " + languages);

    // checks if 3 is present in the arraylist
    System.out.print("Is Java present in the arraylist: ");
    System.out.println(languages.contains("Java"));

  }
}
```

.contains( ) method

Searches the arraylist for the specified element and returns a boolean result.




```
import java.util.ArrayList;

class Main {
   public static void main(String[] args) {
      // create an ArrayList
      ArrayList<Integer> numbers = new ArrayList<>();

      // insert element to the arraylist
      numbers.add(22);
      numbers.add(13);
      numbers.add(35);
      System.out.println("Number ArrayList: " + numbers);

      // find the position of 13
      int position1 = numbers.indexOf(13);
      System.out.println("Index of 13: " + position1);

      // find the position of 50
      int position2 = numbers.indexOf(50);
      System.out.println("Index of 50: " + position2);
   }
}
```

.indexOf( ) method

Searches a specified element in an arraylist and returns the index of the element.