

## CSIS-1410 Lab Quadrotors

What is a Quadrotor? Check out this [video](#)

- Download Quadrotor.java  
In the same directory create a file called QuadrotorApp. It includes the main method

- In main do the following:
  - Create a List of Quadrotors and initialize it with 6 quadrotors like this:

```
List<Quadrotor> rotors = Arrays.asList(  
    new Quadrotor(2, 4, 2), new Quadrotor(3, 4, 4), new Quadrotor(4, 4, 6),  
    new Quadrotor(5, 4, 2), new Quadrotor(6, 4, 4), new Quadrotor(7, 4, 6));
```

- Print the list (List has an overridden toString method) - Compile—run
- Write a private static method called changeOrientation.  
It has one parameter of type List<Quadrotor> and a return type void  
It changes the orientation of the quadrotors by swapping the x and y coordinate of each rotor
- Call change Orientation in the main method, then print the list
- Create a new instance of Quadrotor with coordinates 4, 6, 4. Name it searchItem
- Use a method of interface Collection to check whether the list rotors contains searchItem and print the result
- Print the number of rotors
- Try to remove searchItem.

What happens?

Even though the interface Collection includes methods that change the collection like add and remove, not every collection that implements the interface Collection needs to allow addition or removal of items.

It does have to implement the interface methods though (remember: interfaces are contracts)

Solution: they can implement the mutator method (methods that change the collection) by throwing an Exception ( UnsupportedOperationException ).

The list returned by Arrays.asList( . . . ) does not support the addition or removal of items. ArrayList<E> does.

- Change the initialization of the variable rotors by creating an ArrayList— like this:

```
List<Quadrotor> rotors = new ArrayList(Arrays.asList(  
    new Quadrotor(2, 4, 2), new Quadrotor(3, 4, 4), new Quadrotor(4, 4, 6),  
    new Quadrotor(5, 4, 2), new Quadrotor(6, 4, 4), new Quadrotor(7, 4, 6)));
```

- Remove searchItem and print the list
- Remove the item on index 0 and print the list

### Output:

```
[QR:2/4/2, QR:3/4/4, QR:4/4/6, QR:5/4/2, QR:6/4/4, QR:7/4/6]
```

```
[QR:4/2/2, QR:4/3/4, QR:4/4/6, QR:4/5/2, QR:4/6/4, QR:4/7/6]
```

```
rotors does contain QR:4/6/4
```

```
Number of rotors: 6
```

```
[QR:4/2/2, QR:4/3/4, QR:4/4/6, QR:4/5/2, QR:4/7/6]
```

```
[QR:4/3/4, QR:4/4/6, QR:4/5/2, QR:4/7/6]
```

