

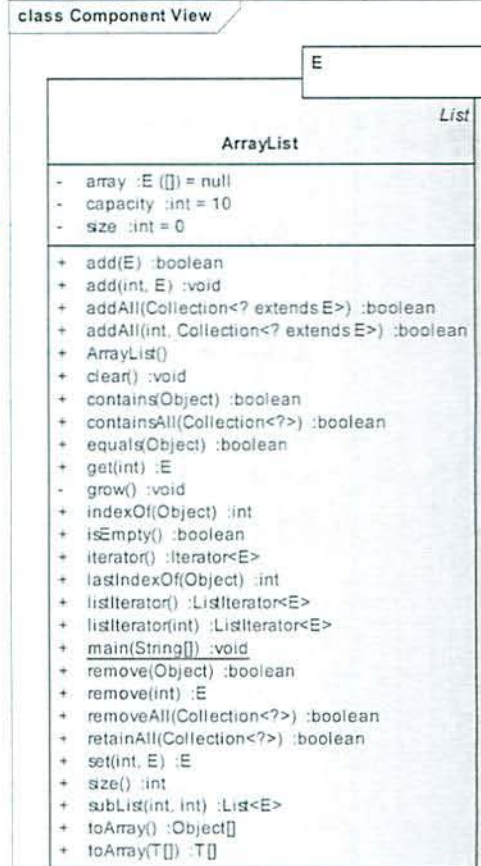
CS-2852 - Dr. Durant - Quiz 2  
Spring 2014, Week 2

1. (2 points) Write the set method for an ArrayList implementing List. Throw an IndexOutOfBoundsException when necessary. Return the element previously stored at the given location.

```
public E set(int index, E element) {
    if (index >= size || index < 0)
        throw new IndexOutOfBoundsException();
    E rv = array[index];
    array[index] = element;
    return rv;
}
```

2. (2 points) Write the remove method for an ArrayList implementing List. Throw an IndexOutOfBoundsException when necessary. Return the removed element.

```
public E remove(int index) {
    if (index >= size || index < 0)
        throw new IndexOutOfBoundsException();
    for E rv = array[index];
    for (int i = index; index < size - 1; ++i)
        array[i] = array[i + 1];
    array[size - 1] = null;
    -- size;
    // stop from keeping an
    // extra reference; help
    // garbage collector
    return rv;
}
```



~~remove~~  
You can keep the  
larger array.  
Capacity unchanged,  
but size decreases.

3. (2 points) Explain the difference **and** relationship between what must be done when you have both an array of String and an ArrayList<String> of size 10 and need to add one more element.

array: user code must allocate a new array  
ArrayList: library code " " " " " if capacity has been reached

↑ difference      ↑ relationship: size increases by 1 in both cases

4. (2 points) When using java.util.ArrayList, explain a key similarity and a key difference of using an ArrayList<Integer> versus an ArrayList (with no type parameter).

Similarity: Both have access to all interface methods, can be iterated in for(:) loop, etc.

Difference: Compiler enforces correct type usage when given type parameter; w/o type parameter, any Object can be stored.

5. (2 points) Given interface Intr with method in() properly implemented by concrete (instantiable, not abstract) class Cla with method cl(). Is each of the following legal or illegal? (If multiple lines and illegal, indicate the first illegal line for full credit.)

- a. Intr i = new Cla();  
i.cl();  illegal: using interface to access method that belongs to class, but not interface
- b. Intr i = new Cla();  
i.in();  legal: interface used to access interface method
- c. Intr i = new Intr();  
i.cl();  illegal: an interface is abstract & cannot be instantiated/newed
- d. Cla c = new Cla();  
c.in();  legal: No class gets/must have all the interface methods