CSE 12 – Basic Data Structures and Object-Oriented Design
Lecture 4

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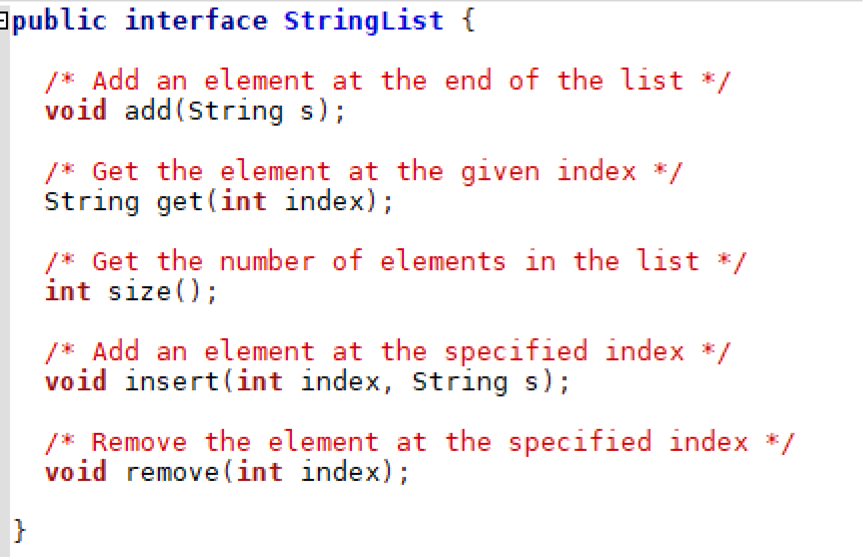
Announcements

- Quiz 4 due Wednesday @ 8am
- PA1 due Wednesday @ 11:59pm

Topics

- Lecture 4 Exercises
- Implement/Test insert and remove methods for ArrayLists



```
public interface StringList {

  /* Add an element at the end of the list */
  void add(String s);

  /* Get the element at the given index */
  String get(int index);

  /* Get the number of elements in the list */
  int size();

  /* Add an element at the specified index */
  void insert(int index, String s);

  /* Remove the element at the specified index */
  void remove(int index);

}
```

During the pre-lecture recording, we commented out insert and remove method. Why?

A. We didn't plan to implement them at that time and commenting out them will make our code cleaner

B. We didn't plan to implement them and commenting them out will avoid a compiler error

C. We were overloading those two methods

D. None of the above

In the ArrayStringList class, we have the following fields

```
String[] elements;

int size;
```

What’s the point of having size as instance variable as the array elements already has size?

A. It is duplicate information for ease of use
B. It avoid calling element.length to save time
C. size indicates how full the array is
D. More than one of the above is correct

In the ArrayStringList class, we have a private helper method expandCapcity

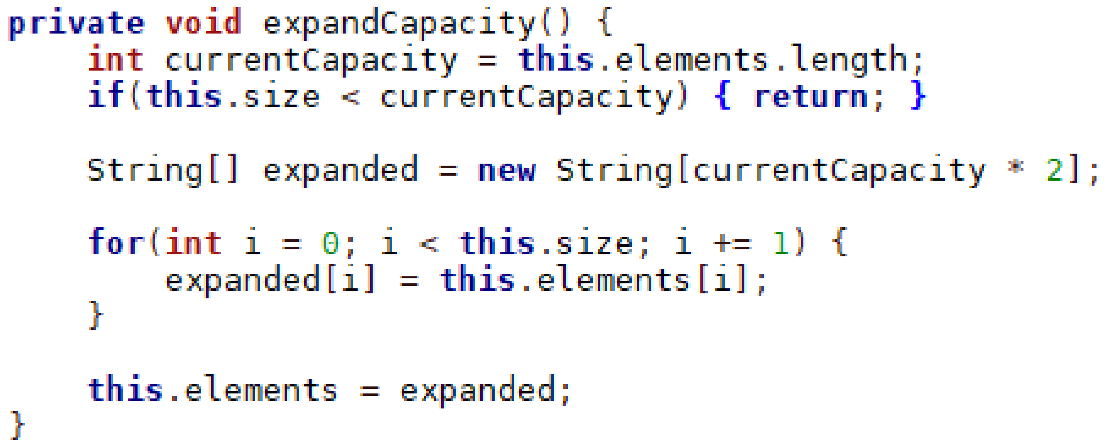
```
private void expandCapacity() {
    int currentCapacity = this.elements.length;
    if(this.size < currentCapacity) { return; }

    String[] expanded = new String[currentCapacity * 2];

    for(int i = 0; i < this.size; i += 1) {
        expanded[i] = this.elements[i];
    }

    this.elements = expanded;
}
```

If I have a foo function inside the ArrayStringList class and have the following code what will be printed out? Assume that the array starts empty and has a capacity of 2.

```
public void foo(){
    String[] tmp = elements;
    add(“a”); add(“b”); add(“c”);
    expandCapacity();
    System.out.println(tmp == elements);
}
```

A. true
B. false
C. there will be a compiler error
D. there will be a runtime error

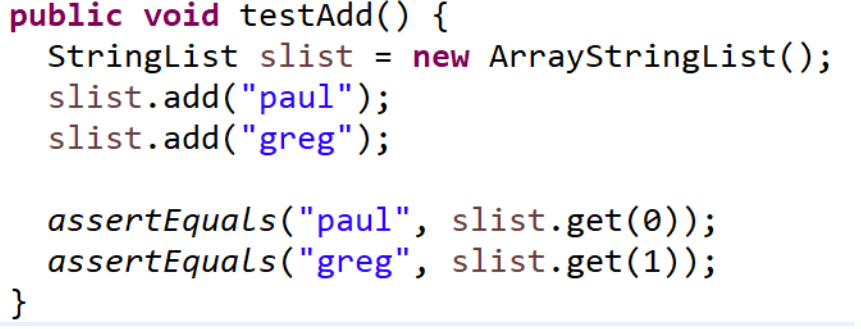
In the ArrayStringList class, we have a private helper method expandCapcity



```
private void expandCapacity() {
    int currentCapacity = this.elements.length;
    if(this.size < currentCapacity) { return; }

    String[] expanded = new String[currentCapacity * 2];

    for(int i = 0; i < this.size; i += 1) {
        expanded[i] = this.elements[i];
    }

    this.elements = expanded;
}
```

When do I need to call this expandCapacity function?

A. Inside the constructors
B. Inside the insert method
C. Inside the remove method
D. Inside the get method
E. Inside the add method



```java
public void testAdd() {
  StringList slist = new ArrayStringList();
  slist.add("paul");
  slist.add("greg");

  assertEquals("paul", slist.get(0));
  assertEquals("greg", slist.get(1));
}
```

In our tester for add, we wrote the code for inserting two elements and test if we added properly. Can I write my tester as

assertEquals(slist.get(0), “paul”);

assertEquals(slist.get(1), “greg”);

A. Yes they are basically the same as what we wrote in pre-lecture video

B. No you can’t switch the order as it will generate the wrong test result

C. No you can’t switch the order as it makes the interpretation of the test result inaccurate

ArrayList Insert

```
/* Add an element at the specified index */
void insert(int index, String s);
```

- Write a test case for the ArrayList insert method
- Implement the ArrayList insert method

ArrayList Remove

```
/* Remove the element at the specified index */
void remove(int index);
```

- Write a test case for the ArrayList remove method
- Implement the ArrayList remove method