A bit more OOP

How was the homework?

Variable Scope - Quiz

```
public class Rectangle {
  private int width;
  private int height;

  public Rectangle(int width, int height) {
    this.width = width;
    this.height = height;
  }

  public void quiz(int a, int b) {
    int width = 5;
    this.width = width;

    int height = this.width * 2;
    this.height = height;

    width = 25;
    int area = width * height;
    area = this.width * this.height;

    int sum = a + b;
    sum = this.a + this.b;
  }
}
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public static void main(String[] args) {
  Rectangle rect = new Rectangle(1, 2);
  rect.quiz(3, 4);
}
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	width	height	this. width	this. height	a	b
1						

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1	1	2	1	2		

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1	1	2	1	2	-	-

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1	1	2	1	2	-	-
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1	1	2	1	2	-	-
2	1	2	1	2	3	4

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3	5		5			

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3	5	2	5	2	3	4
4		10		10		

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5							

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5	25						

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3	5	2	5	2	3	4	-
4	5	10	5	10	3	4	-
5	25	10					250

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3	5	2	5	2	3	4	-
4	5	10	5	10	3	4	-
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6			5	10			50

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5	25	10	5	10	3	4	250	-
6	25	10	5	10	3	4	50	-
7	25	10	5	10	3	4	50	7

ArrayLists

ArrayLists

Sometimes, we don’t know how big an array has to be before runtime.

ArrayLists

Sometimes, we don’t know how big an array has to be before runtime (e.g. when we use a Scanner)

Or, we know that the size of our array is going to change.

ArrayLists

You can think of ArrayLists as arrays with a variable (dynamic) size.

We don’t have to specify a size beforehand, Java takes care of that for us.

ArrayLists

For example, think of a guest list for an event (e.g., events on Facebook).

- We don’t know how many people are going to attend the event.
- If people sign up for the event, our list grows.
- If people decide that they do not want to attend the event anymore, the list shrinks.

ArrayLists

Step 1:

We want to use a class we did not write ourselves

→ we need to import it from the Java Framework

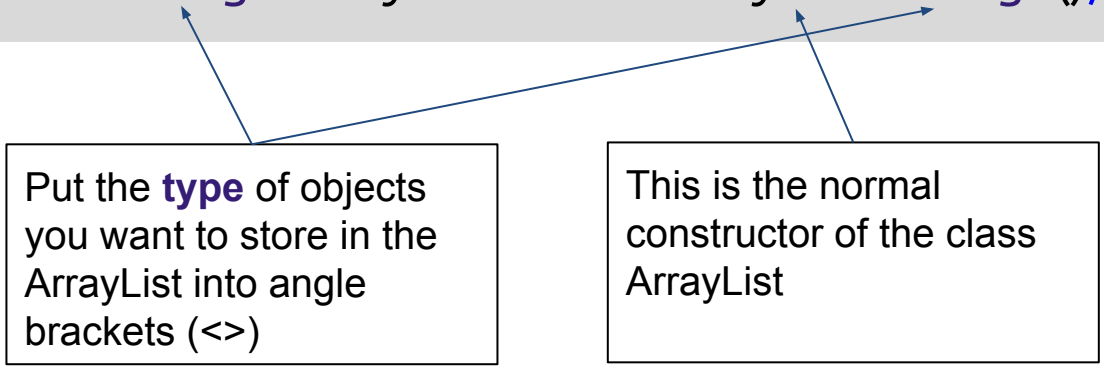
```
import java.util.ArrayList;
```

ArrayLists

Step 2:

How to declare an ArrayList of a certain type

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



ArrayLists

Step 3: Use it!

```
String[] arrayOfSizeFive = new String[5];
```

→ [null, null, null, null, null]

```
arrayOfSizeFive[0] = "Hello world";
```

→ [“Hello world”, null, null, null, null]

```
arrayOfSizeFive[1] = "Second entry";
```

→ [“Hello world”, “Second entry”, null, null, null]

```
String first = arrayOfSizeFive[0];
```

→ “Hello world”

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

→ [] // it is completely empty

```
arrayList.add(0, "Hello world");
```

→ [“Hello world”]

```
arrayList.add("Second entry");
```

→ [“Hello world”, “Second entry”]

```
String first = arrayList.get(0);
```

→ “Hello world”

ArrayLists – Useful methods

```
// Removes all elements from this list.
public void clear();

// Returns the number of elements in this list.
public int size();

// Returns true if this list contains no elements.
public boolean isEmpty();

// Returns a string representation of this list.
public String toString();
```

Live exercise

Remember the example about events from before.
My solution with arrays is poor.

→ Improve it using ArrayList
→ Address all TODOS in Event.java
→ All the other code can stay as is