Java-ArrayList

marp: true

ArrayLists

- What if we could have a "bundle" of variables (like an array), but the size were not fixed?
  - ArrayLists!
- Wouldn't it be cool if literally everything possible were less convenient than arrays?
  - What?! No!
  - ArrayLists!
- Oh, and also they'll be less computationally efficient! It's perfect, right?!
  - Again, no!
  - ArrayLists!

Declaring and Initializing ArrayLists

```
ArrayList<String> listName;

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

Declaring an Array

```
ArrayList<String> listName; // Declare an ArrayList variable
```

- The variable `listName` is declared as an ArrayList to store `String`s
- At this point, the ArrayList variable has been declared, but it does not have an actual ArrayList object assigned to it yet
- The memory for the ArrayList object will be allocated later when we use the `new` operator

Initializing an ArrayList

```
listName = new ArrayList<String>(); // create ArrayList object
```

- The `new` operator is used to allocate memory for the ArrayList
- It is followed by a constructor call
- The reference of this new ArrayList object is assigned to the `listName` variable
- Notice that we don't say anything about the size of the ArrayList

Declare and initialize ArrayLists

- declare and initialize an ArrayList variable

Accessing and Assigning ArrayList Elements

```
ArrayList<String> myList = new ArrayList<String>;

myList.add("Alexa"); // Adds a new element "Alexa" at the end of the list

String value = myList.get(0); // Access the first element
System.out.println(value);
```

- Array elements are accessed by their index, which is a zero-based integer

- The first element is at index 0, the second element at index 1, and so on.

- Everything you want to do with ArrayLists has to be done with methods

What happens if you access a slot of an ArrayList before adding to that slot?

What happens if you access a slot of an array before assigning to that slot?

- **Answer**: ArrayListIndexOutOfBoundsException!

What happens if you try to access an index that doesn't exist?

What happens if you try to access an index that doesn't exist?

- *Answer:* `ArrayListIndexOutOfBoundsException`
- Remember that unless you do fancy stuff, any exception crashes the program!!