

- Last time
- This time
 - Walk through some real-life examples of inheritance, encapsulation, and polymorphism through interfaces and subclasses/superclasses
 - The last thing we need before we kick off our adventure into abstract data types and structures: Generics
 - Begin advanced abstract data types / structures
- Real life abstraction
- Generics
 - Most of the rest of the class will be dedicated to building classes whose instances contain **collections** of data
 - Collections is a big new word: we'll become friends with it!
 - The data items in any one collection will have the same – or related through inheritance – data types.
 - This will fit every situation beautifully (you'll see why soon)
 - We've already worked with one type of these collections
 - Arrays
 - Instances are of the same (or related) type
 - Remind folks of array syntax
 - Arrays, like primitives, are a holdover from a previous era
 - The syntax is different than how Java usually does
 - This is how we "specify a collection when that collection is an array"
 - `String[]`
 - As soon as we get out of arrays into the simplest type of non-array collection, we'll write things like this:
 - `ArrayList<String>`
 - This is also a collection of Strings, it's just written differently
 - We'll talk about what ArrayList means likely on Monday, but first I want to talk about this `<>` syntax
 - It's necessary to understand the ideas of ArrayLists, and much of what follows in the course
 - Let's take a step back and focus on generics outside the context of collections

- Let's say you're writing a program where you need lots of ordered pairs of objects, but those objects are instances of lots of different classes
 - OrderedPair is a common notion in math
 - $(a,b) \neq (b,a)$
 - You're writing library that want's to implement that idea for any arbitrary class
 - Fruit, BankAccount, RockStar, whatever
- Key points
 - Look how little code I had to write to support expandable arrays for ANYTHING!
 - Split off into FixedSizeArray
 - Use interfaces and superclasses
 - Talk about efficiency
 - Show CoolerArrays class with Integer and see what happens

What's the alternative?