

# CSE 1325 - Object-Oriented Programming

## Dynamic Arrays in Java

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# Dynamic Arrays in Java

Frequently, we will want to work with data of variable size that may change depending on the input.

Since standard Arrays are **immutable**, they do not meet such a requirement.

# Dynamic Arrays in Java

Dynamic arrays are achievable in Java via the `ArrayList` `class`.

It is possible to create dynamic arrays for any type, while still taking advantage of the sorting and search methods provided by the `Arrays` class.

# ArrayLists

Stated in the [ArrayList documentation](#), the ArrayList class is declared as

```
public class ArrayList<E> { ... }
```

The syntax <E> declares a **type** parameter for this class, where E can be any arbitrary type. This is extremely useful!

# ArrayLists

ArrayLists have 3 constructors...

1. `ArrayList()`
2. `ArrayList(int initialCapacity)`
3. `ArrayList(Collection<? extends E> c)`

# ArrayLists

Using the constructors requires that the type be specified as well.  
**This is where E comes in.**

```
// Create an ArrayList of Player  
var players = new ArrayList<Player>();
```

In this case, we specify the elements in this ArrayList are of type Player.

# ArrayLists

Let's study some of the more common methods of the `ArrayList` `class` in a workable program.

**Example:** `ArrayListExamples.java`

# ArrayLists

`ArrayLists` are not synchronous, meaning that we will have to be careful when using them with multiple threads (more on that much later).