Representing Lists in Java

Java provides a few ways to represent lists, including the ‘array’ which is part of the Java language proper, and a number of classes in the Java library. Perhaps the easiest way to represent lists is with a library class called **ArrayList**. Take a look at the following Java and Python samples:

Java:  [http://www.cs.usfca.edu/~wolber/courses/110.f07/javaSamples/ListTest.java](http://www.cs.usfca.edu/~wolber/courses/110.f07/javaSamples/ListTest.java)
Python:  [http://www.cs.usfca.edu/~wolber/courses/110.f07/javaSamples/ListTest.py](http://www.cs.usfca.edu/~wolber/courses/110.f07/javaSamples/ListTest.py)

Here's the key differences in terms of how you do things:

<table>
<thead>
<tr>
<th>Java ArrayList</th>
<th>Python list</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArrayList&lt;type&gt; list = new ArrayList&lt;type&gt;()</td>
<td>list=[]</td>
</tr>
<tr>
<td>list.add(object)</td>
<td>list.append(object)</td>
</tr>
<tr>
<td>list.get(i)</td>
<td>list[i]</td>
</tr>
<tr>
<td>list.size()</td>
<td>len(list)</td>
</tr>
<tr>
<td>list2 = list.clone()</td>
<td>list2=list[:]</td>
</tr>
</tbody>
</table>

ArrayList requires the type of the elements in the array to be specified (just like everything in Java). Consider how you declare and set an integer in Java:

```java
int x; // declare x as an integer
x = 4; // set x to 4
```

ArrayList is similar but you declare that the variable is a list of a specific type using `<>`

```java
ArrayList<String> list = new ArrayList<String>
list.add("abc");
```

ArrayList can only hold object types, not scalars like 'int'.

ArrayList is not 'built-in' to the language, but part of the core Java library (must import java.util.*)

### Instructor Coding Sample

Write a class Person and a main program that creates three person’s, puts them in a list, and totals up the age of each person in the list.

### In Class Programming Assignment:

To practice using ArrayList and get started with the ParkingLot program, write the following code in the files Car.java and ParkingLot.java:
* A class Car with three public data members: initialSpot, currentSpot and finalSpot, all of type integer.

* A class ParkingLot with a main method that creates three cars, puts them in a list named ‘waitingList’, and prints out the list.

Next steps:

Add a constructor to Car
Define ‘waitingList’ as a data member of class ParkingLot instead of a local.
Read in the initial spot for each car using Scanner class