



JAVA LISTS

LIBRARIES

- A **library** is a collection of frequently used tools to facilitate programming large applications (or other libraries)
- Examples you probably have seen
 - `java.Math`
 - `java.util.Scanner`
 - `java.util.Random`
- Other examples
 - Access to servers/databases
 - Graphics
 - Reflection

LIBRARIES

“Truly knowing a language requires knowing the library”

-Paraphrased from Bjarne Stroustrup



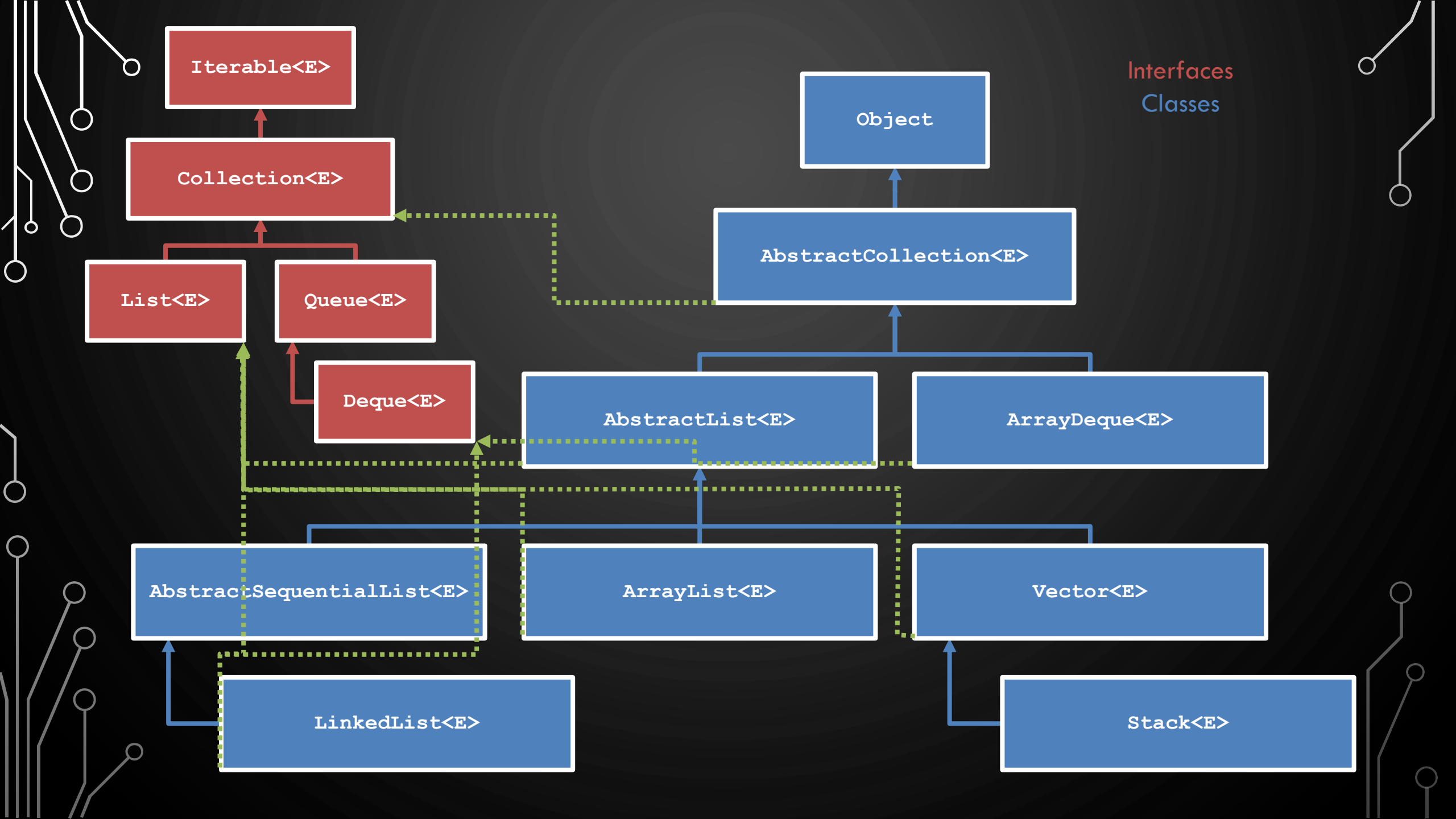
“Libraries are languages”

-Paraphrased from Gabriel dos Reis



SUMMARY OF CLASSES (LIST RELATED)

- `ArrayList<E>` - Resizable-array doubling (supports List)
- `LinkedList<E>` - Doubly linked list (supports List, Deque, Stack, and Queue)
- `Vector<E>` - Resizable-array incremental (supports List)
- `Stack<E>`
- `ArrayDeque<E>` - Resizable-array doubling (supports Deque, Stack, and Queue)
- Others outside the scope of this course
- To find how to use them, go to the Java API!



EXAMPLE OF USING ARRAYLIST<E>

```
1. Scanner s = new Scanner(new File("numbers.txt"));
2. ArrayList<Integer> numbers = new ArrayList<>();
3. while (s.hasNextInt())
4.     numbers.add(s.nextInt());
5. ...elsewhere...
6. int sum = 0;
7. for (int n = 0; n < numbers.size(); ++n)
8.     sum += numbers.get(n);
```

PROBLEMS

- Linear regression. Lets help the sciences by creating a simple program for linear regression modeling. [Look here for how we compute correlation coefficients.](#) [Here is experimental data.](#)
- For a given data file, find the correlation coefficient between all pairs of columns. Find the most correlated items.
- I recommend trying the solve this problem for x08.txt
- Lets discuss together how to break the problem down into manageable pieces.