JAVA LISTS
• **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
“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.