Week 3 Discussion

Wednesday, 10/16/19

Reminders

PSA2 due Tuesday, October 22 11:59pm
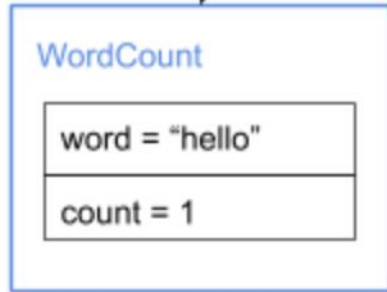
Midterm 1 next Monday, October 21 in class

Today's agenda

- Test Driven Development (TDD)
- Overview of PA2 (`WordCount.java` & `WordCountList.java`)
  - `addWord`
  - `toString`
  - `getWordsFromFile`
  - `removeWords`
  - `outputWords`
  - `topKWords`
- Useful Classes for Input/Output (IO)

Test Driven Development

- What is Test Driven Development?
- What are the advantages?
- It may be annoying for some people, but it makes your code LESS error prone!

WordCount.java

Instance variable?

Constructor, copy constructor

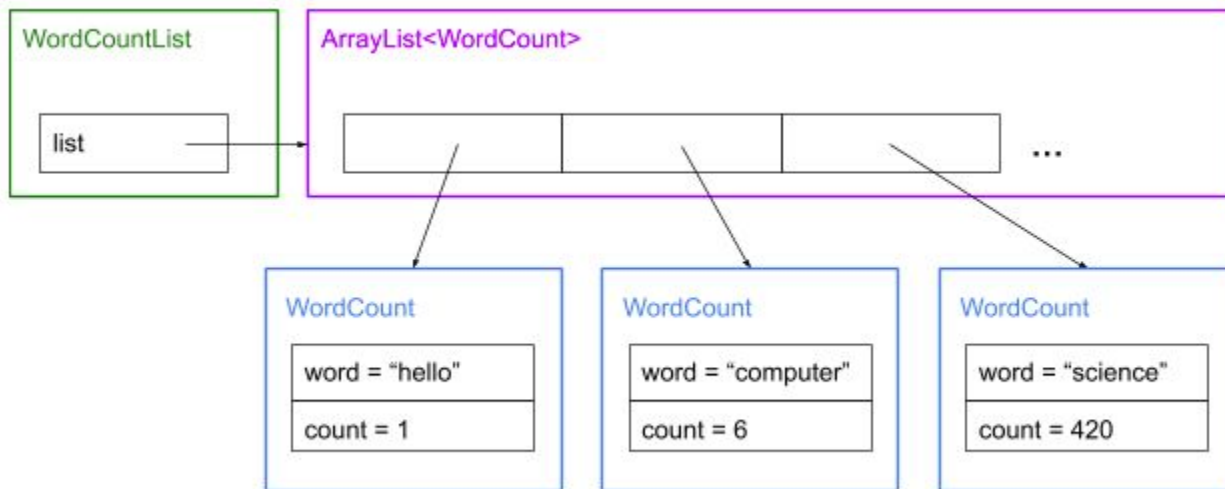Method to manipulate count (increment, set)

toString()

equals() (compare two WordCount objects)

- Can we use == here?

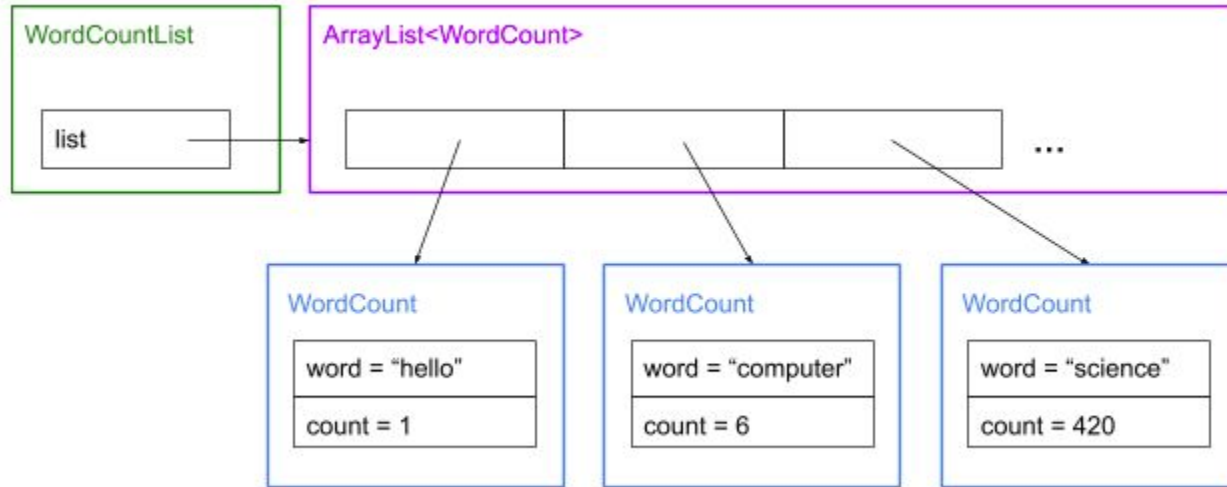# WordCountList.java

Why do we use `ArrayList` instead of `Array`?

public void addWord(WordCount word)

- If the word already exists, increment its count
  - Remove the word from the list, increment its count, and place it in the correct location
- Otherwise, if the word doesn't already exist, add the word to the list in the correct location

- The list should contain WordCounts in ascending order based on each count
  - If words have the same count, break the tie by lexicographical order

Lexicographical Order Examples

- "a" would come before "b"
- "01" would come before "011"
- "A" would come before "a"

public String toString()

- would return: "hello(1) computer(6) science(420)"
- use `WordCount`'s `toString()` method on each WordCount in the list

```
public void getWordsFromFile(String
filename) throws IOException
```

- Add words in the file `filename` to `list`
- Loop through every word in file
- Call `addWord(WordCount word)`method on every word
- Don't use this anywhere else!
  - Don't call `getWordsFromFile()` from other methods in WordCountList

```
public void removeWords(String omitFilename)
throws IOException
```

- omitFilename: name of file that contains words to be removed
- Remove words in file omitFilename from list
- Case-insensitive ("apple" == "Apple")
- Same process as getWordsFromFile:
  - Write tests
  - Implement method
  - Run tests + Debug

```
public void removeWords(String
omitFilename) throws IOException
```

Sample.txt

This

Is

The

Before:

hello(1) this(2) is(3) computer(4)
science(5)

After:

hello(1) computer(4) science(5)

public void outputWords(boolean printToConsole) throws IOException

- print all of the words in the `ArrayList` of `WordCount` objects
- printToConsole == true
  - print to `stdout`
- printToConsole == false
  - print to `myOutput.out` → how do we do this?
  - (hint: use `PrintStream`)

public List<WordCount> topKWords(int k)

- return the first k words that have the greatest count
  - if there are less than k words, then return all of the elements
- make sure to make a deep copy of each element
  - how can you check to make sure you're making a valid deep copy?
- algorithm: iterate from the end of the list to the front

Useful Classes in Java for IO

- File (import java.io.File)
  - allows you to open a file and do various file operations (e.g. check to see if it's a directory, hidden, etc, or rename it)
- Scanner (import java.util.Scanner)
  - a text scanner that allows you parse text from various input sources such as a `File` or `InputStream` like `stdin`
- PrintStream (import java.io.PrintStream)
  - allows you to print data more easily to various output sources such as a `File` or `OutputStream` like `stdout`

Worksheet / Demo