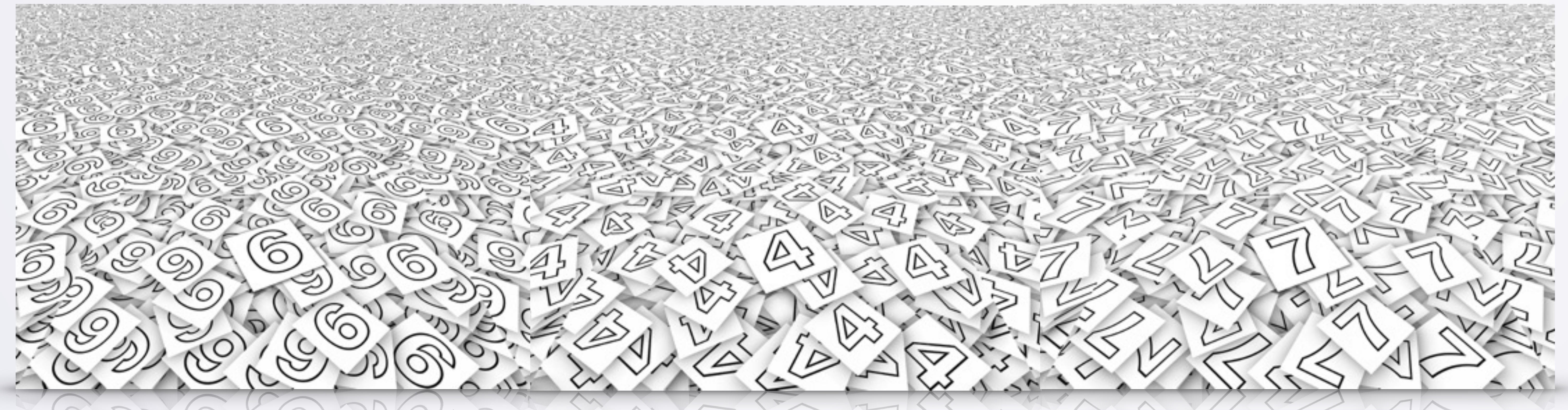
Telling a Random Story

ArrayList

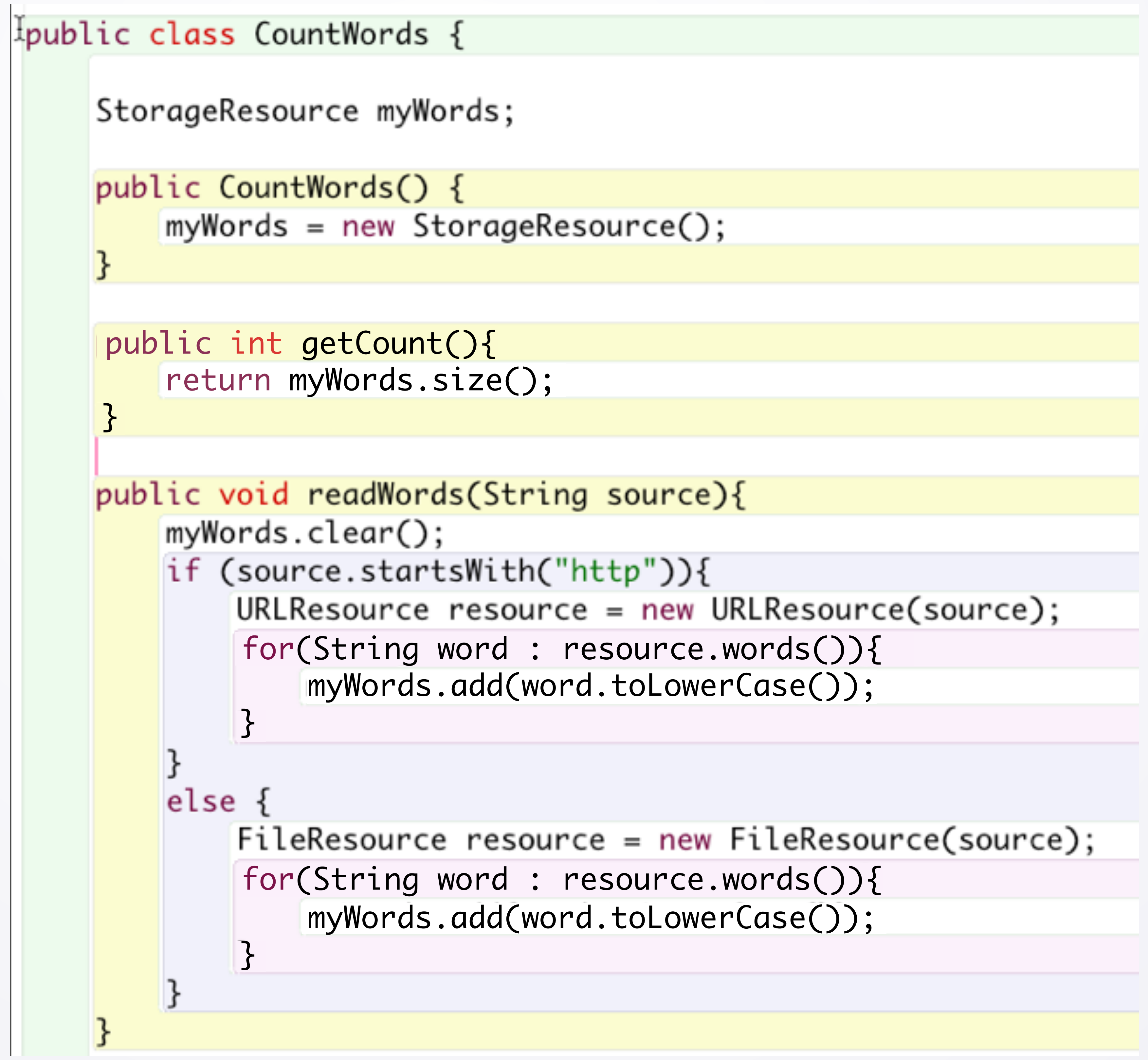
Counting Different Words

- Count number of different words or IP-addresses or data elements of any type
  - We've counted 'c', 'g', 't', and 'a'
  - We've counted 'A', 'B', ...'Z'
  - First step in "the", "cat", "albatross":
    - Count number of different words



Using StorageResource

- Using StorageResource makes it easy



```java
public class CountWords {

    StorageResource myWords;

    public CountWords() {
        myWords = new StorageResource();
    }

    public int getCount(){
        return myWords.size();
    }

    public void readWords(String source){
        myWords.clear();
        if (source.startsWith("http")){
            URLResource resource = new URLResource(source);
            for(String word : resource.words()){
                myWords.add(word.toLowerCase());
            }
        }
        else {
            FileResource resource = new FileResource(source);
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        }
    }
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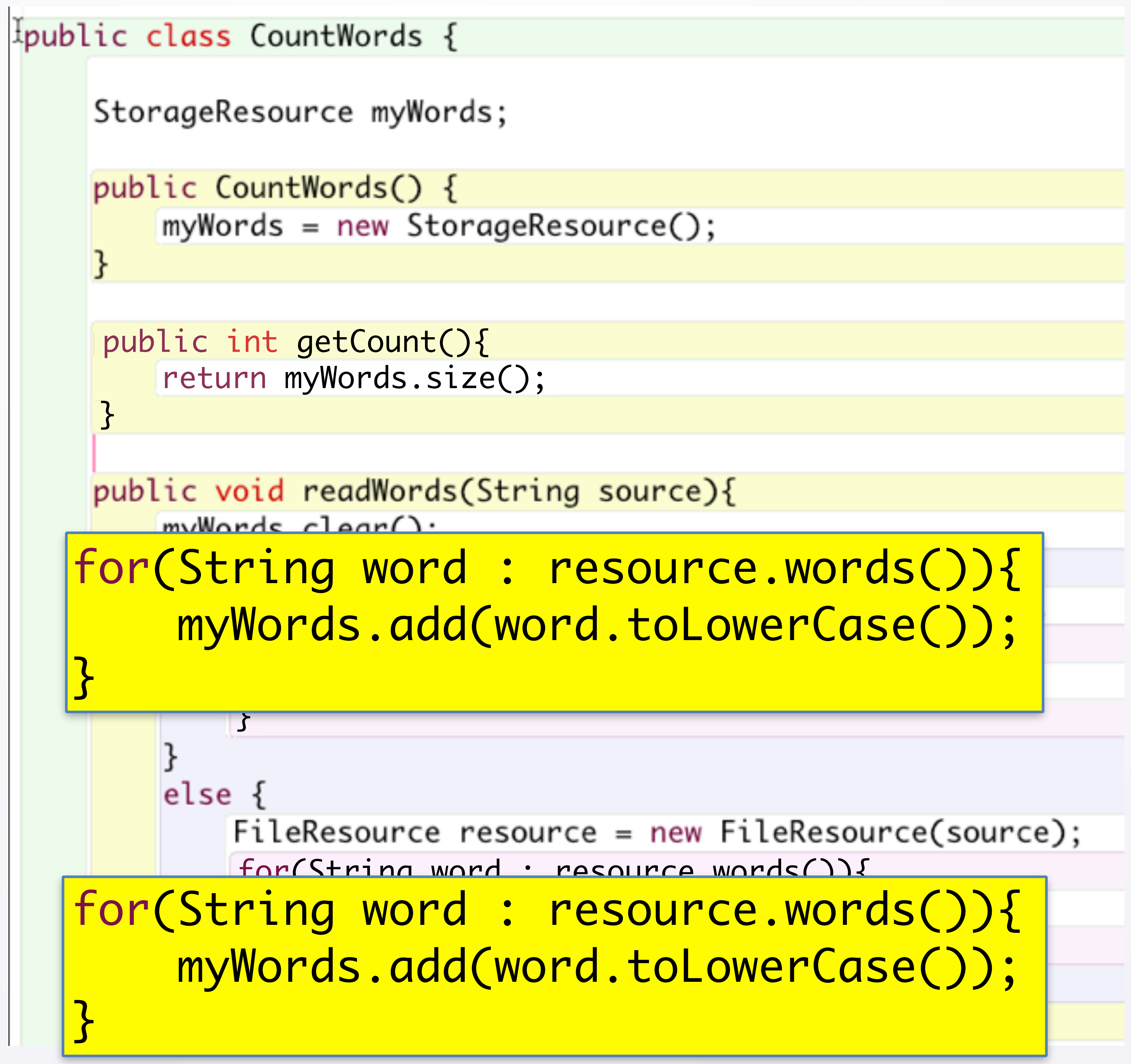
Using StorageResource

- Using StorageResource makes it easy
  - To count all words in a file or URL



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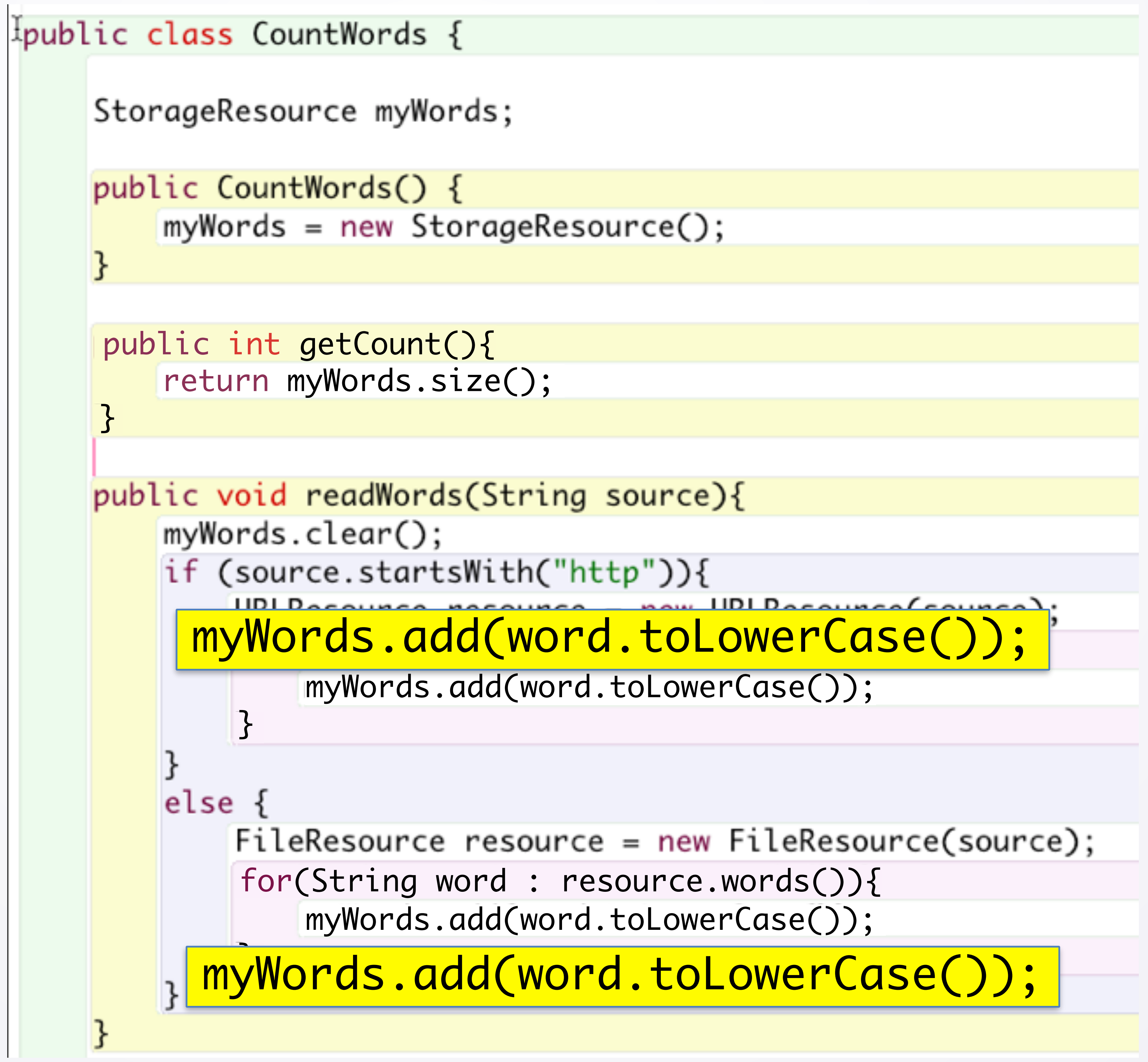

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Using StorageResource

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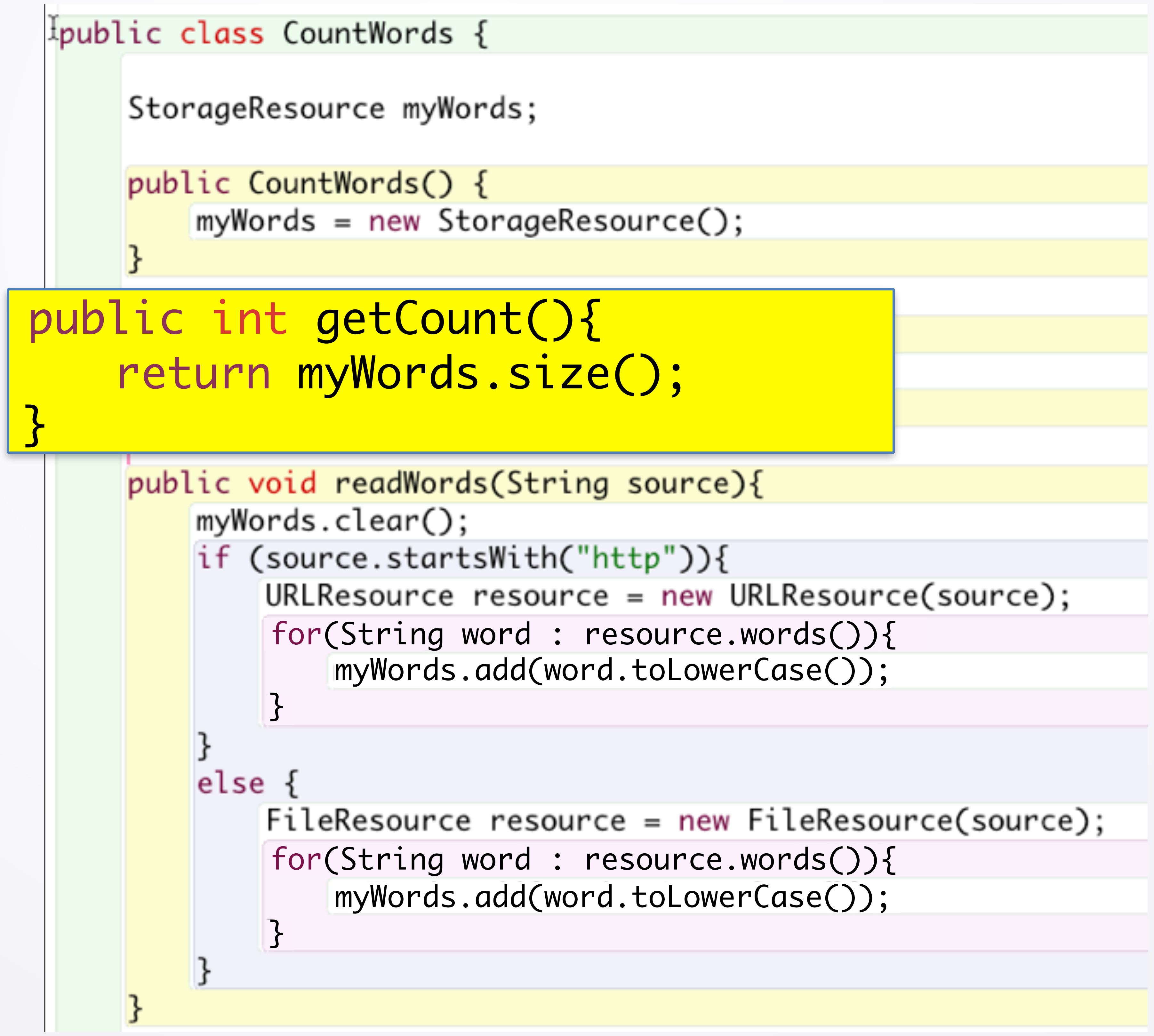
  - To count all words in a file or URL
  - Add each to StorageResource
    - Use .size()



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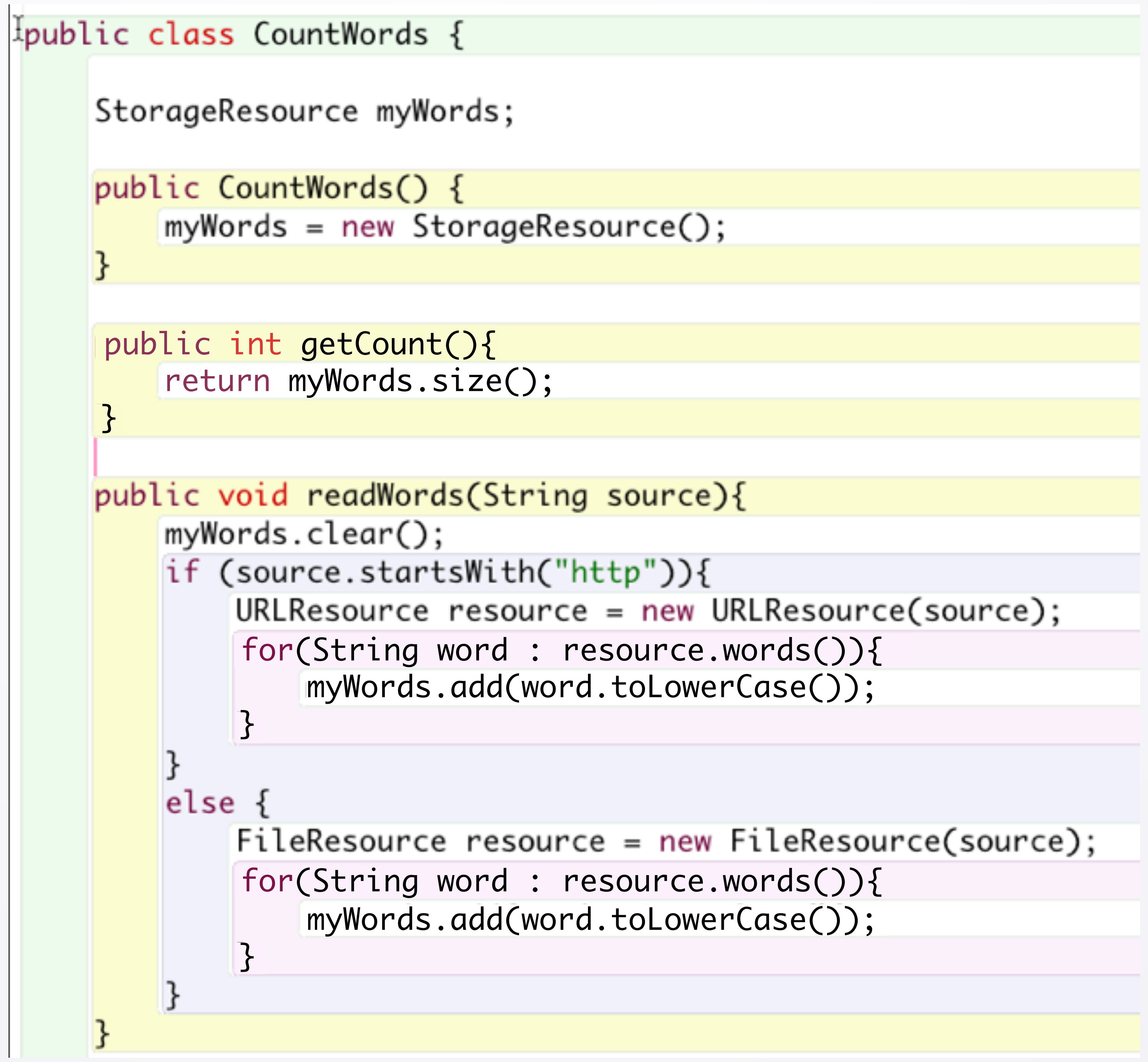
Using StorageResource

- Using StorageResource makes it easy
  - To count all words in a file or URL
  - Add each to StorageResource
    - Use .size()
  - Different words?



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Modifying Code for Unique Words

- Field: **`StorageResource myWords`**
  - Store all words read from a file

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Modifying Code for Unique Words

- Field: **`StorageResource myWords`**
    - Store all words read from a file
    - only unique/different words

```
FileResource resource = new FileResource(source);
for(String word : resource.words()){
    myWords.add(word.toLowerCase());
}
```

```
FileResource resource = new FileResource(source);
for(String word : resource.words()){
    word = word.toLowerCase();
    if (! myWords.contains(word)){
        myWords.add(word);
     }
}
```

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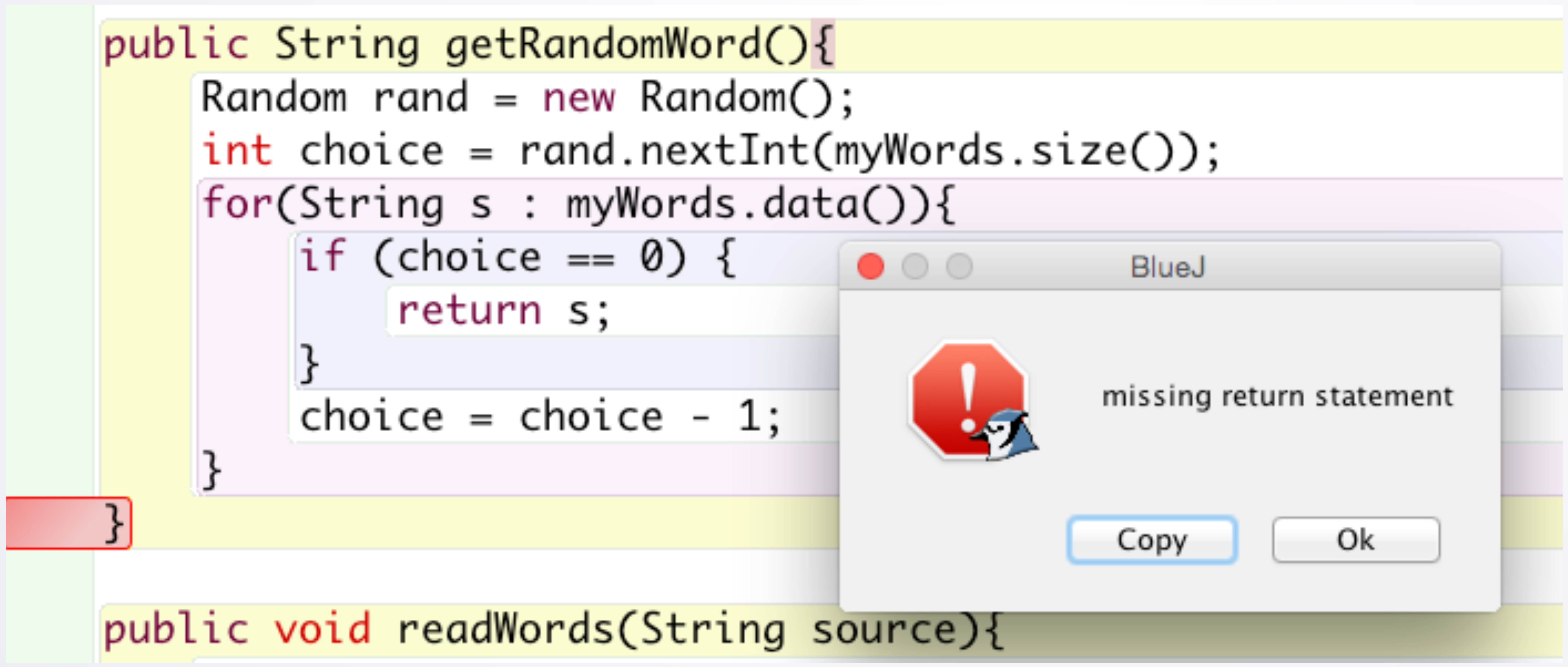
Random Choice from StorageResource

- StorageResource accessed as iterable
    - Must use for loop to get at all elements
    - Even if we stop early, coding issues



```
public String getRandomWord(){
    Random rand = new Random();
    int choice = rand.nextInt(myWords.size());
    for(String s : myWords.data()){
        if (choice == 0) {
            return s;
        }
        choice = choice - 1;
    }
}

public void readWords(String source){
```

missing return statement

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Random Choice from StorageResource

- StorageResource accessed as iterable
  - Must use for loop to get at all elements
  - Even if we stop early, coding issues
- Would be faster and simpler with String[]
  - But don't know capacity before reading!

```
public String getRandomWord(String[] words) {
    Random rand = new Random();
    int index = rand.nextInt(words.length);
    return words[index];
}
```

ArrayList as a Solution

- Class **`ArrayList`** in package **`java.util`**
  - Expands as needed using **`.add`** method
  - Provides access via index to any element in list
  - Essential in implementing StorageResource!
- Basic syntax, we'll see usage in code

```
ArrayList<String> words = new ArrayList<String>();
words.add("hello");
words.add("world");
String s = words.get(1);
words.set(0,"goodbye");
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