Quick review of last lecture

Variable Length Parameter Lists

- Suppose we wanted to create a method that processed a different amount of data from one invocation to the next.
- For example, let’s define a method called average that returns the average of a set of integer parameters.

```java
// one call to average three values
mean1 = average (42, 69, 37);
// another call to average seven values
mean2 = average (35, 43, 93, 23, 40, 21, 75);
```

Variable Length Parameter Lists

- Using special syntax in the formal parameter list, we can define a method to accept any number of parameters of the same type.
- For each call, the parameters are automatically put into an array for easy processing in the method.

```java
public double average (int ... list) {
    double result = 0.0;
    if (list.length != 0) {
        int sum = 0;
        for (int num : list) 
            sum += num;
        result = (double)sum / list.length;
    }
    return result;
}
```
CD Collection Example

- Now let's look at an example that manages a collection of CD objects.
- See `Tunes.java` (page 387).
- See `CDCollection.java` (page 388).
- See `CD.java` (page 391).

Example: Angle Between Vectors

Two-Dimensional Arrays

- A one-dimensional array stores a list of elements.
- A two-dimensional array can be thought of as a table of elements, with rows and columns.

Two-Dimensional Arrays

- To be precise, in Java a two-dimensional array is an array of arrays.
- A two-dimensional array is declared by specifying the size of each dimension separately:
  ```java
  int[][] scores = new int[12][50];
  ```
- A array element is referenced using two index values:
  ```java
  value = scores[3][6];
  ```
- The array stored in one row can be specified using one index.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>table</td>
<td>int[][]</td>
<td>2D array of integers, or array of integer arrays</td>
</tr>
<tr>
<td>table[5]</td>
<td>int[]</td>
<td>array of integers</td>
</tr>
<tr>
<td>table[5][12]</td>
<td>int</td>
<td>integer</td>
</tr>
</tbody>
</table>
Multidimensional Arrays

- An array can have many dimensions – if it has more than one dimension, it is called a multidimensional array
- Each dimension subdivides the previous one into the specified number of elements
- Each dimension has its own length constant
- Because each dimension is an array of array references, the arrays within one dimension can be of different lengths
  - these are sometimes called ragged arrays

Example: Multiplication Table (HW6)

- Implemented using a 2D array

THE END