Announcements:
- Project 5 due today at 6pm
- Prelim 3 on Tuesday, 4/19, at 7:30pm
- DrJava: remember to turn off backups! See 4/6 announcements on course website.
- P5 Dealer method finishHand should have a parameter:
  ```java
  public void finishHand(Hand player_hand)
  ```
Parameter is needed because method deal checks both dealer and player’s hand

Previous Lecture:
- OOP review
- Selected methods in Project 5

Today’s Lecture:
- 1-dimensional array
- Selection Sort

Reading:
- JV: Sec 7.1, 7.2 (exclude Listing 7.4)

Arrays
- An array is an object
- An array is an ordered list of values (or objects)
- Each element is of the same type

Entire array has a single name
Each element has an integer index

<table>
<thead>
<tr>
<th>data</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>79</td>
<td>87</td>
<td>94</td>
<td>82</td>
<td>67</td>
<td>98</td>
<td>87</td>
<td>81</td>
<td>74</td>
<td>91</td>
</tr>
</tbody>
</table>

An array of size N is indexed from 0 to N-1

Array declaration

```java
type[] identifier;
```

Examples:
- int[] counts;
- double[] price;
- boolean[] flip;
- char[] vowel;
- String[] names;
- Interval[] series;

Array declaration & construction

```java
type[] identifier = new type[size];
```

Example:
- int[] counts= new int[4];

Then values can be assigned into the cells, e.g.:
- counts[0] = 6;
- counts[2] = 9;

Array construction (instantiation)

```java
new type[ size ]
```

Example:
- new int[4]

Declaration & creation:
- int limit= 4;
- double[] price;
- price= new double[limit];
Array length and default values

Once created, an array has a fixed length, held in the array's constant called `length`:

```java
int[] counts = new int[4];
System.out.println(counts.length);
// will print 4
```

Cells in arrays have default values:

```java
System.out.println(counts[2]);
// will print 0
```

Array creation with initializer list

Create an array using an initializer list:

```java
int[] x = new int[] {6, 3, 4, 8};
```

Length of array is determined by length of the initializer list.

Index operator []

Accesses an element of the array, e.g.:

```java
int[] count = new int[101];
// declaration & instantiation
count[70+9] = 98;
// set count[79] to 98
int grade = Keyboard.readInt();
count[grade] = count[grade] + 1;
count[grade]++;
```

Elements in an array

If `count` is of type `int[]`, i.e., an array of `ints`, then the type of `count[i]` is `int` and `count[i]` can be used anywhere an `int` variable can be used.

Pattern for processing an array

// assume an array has been
// created and is referred to by
// variable arr

```java
for (int i=0; i<arr.length; i++) {
    // perform some process
    // (on arr[i])
}
```

Example

// Create an array of length 6
// with random numbers in the range
// of 5 to 9. Calculate the sum.

```java
double[] a = new double[6];
double sum = 0; // sum so far
for (int j=0; j<a.length; j++) {
    a[j] = Math.random()*4+5;
    sum = sum + a[j];
}
```