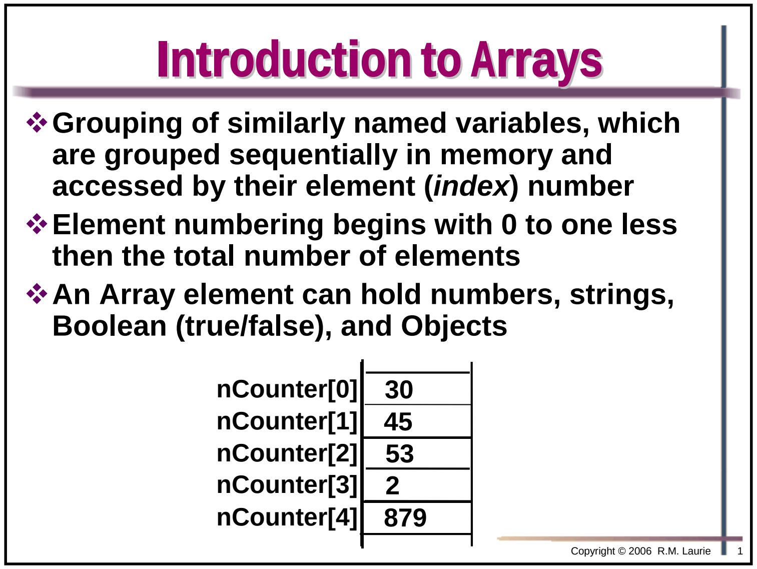
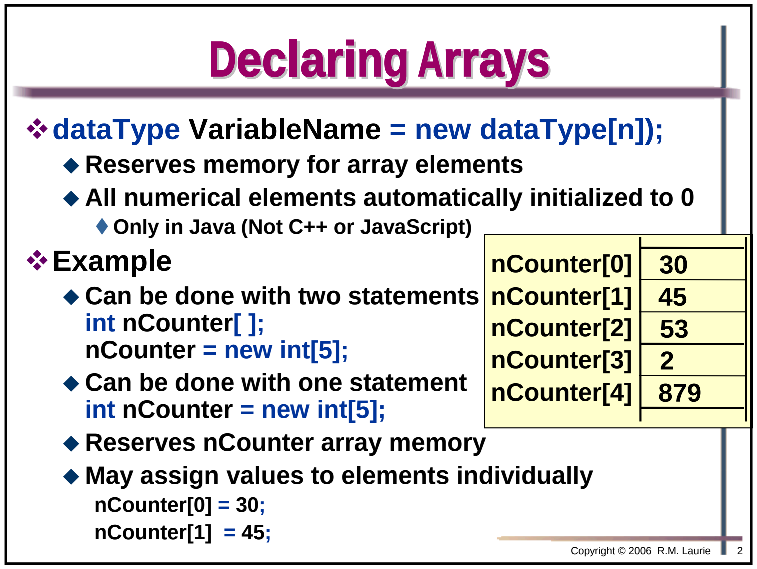


Introduction to Arrays

- Grouping of similarly named variables, which are grouped sequentially in memory and accessed by their element (*index*) number
- Element numbering begins with 0 to one less then the total number of elements
- An Array element can hold numbers, strings, Boolean (true/false), and Objects

nCounter[0]	30
nCounter[1]	45
nCounter[2]	53
nCounter[3]	2
nCounter[4]	879



Declaring Arrays

- dataType VariableName = new dataType[n]);
  - Reserves memory for array elements
  - All numerical elements automatically initialized to 0
    - Only in Java (Not C++ or JavaScript)
- Example
  - Can be done with two statements

```
int nCounter[ ];
nCounter = new int[5];
```

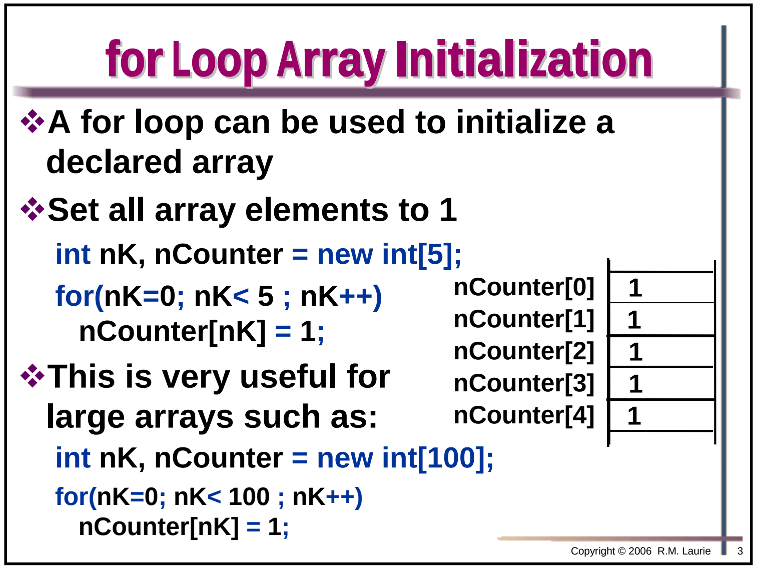
  - Can be done with one statement

```
int nCounter = new int[5];
```

  - Reserves nCounter array memory
  - May assign values to elements individually

```
nCounter[0] = 30;
nCounter[1]  = 45;
```

nCounter[0]	30
nCounter[1]	45
nCounter[2]	53
nCounter[3]	2
nCounter[4]	879



for Loop Array Initialization

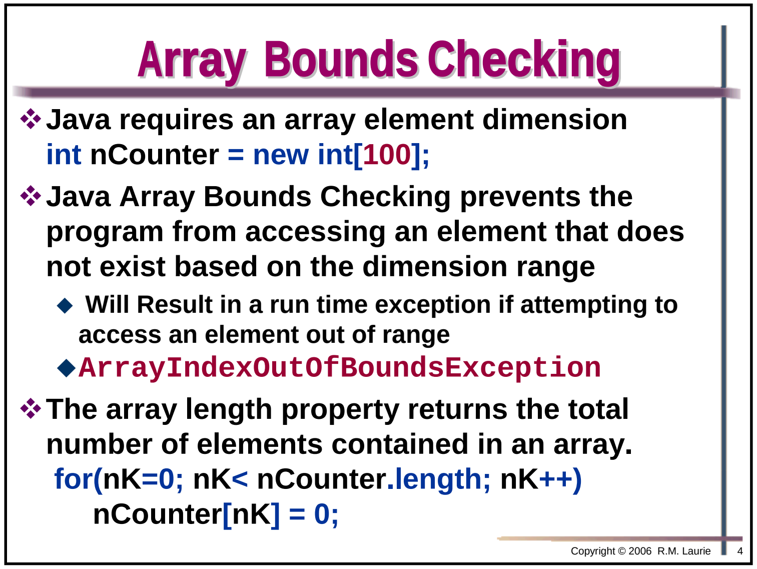
- A for loop can be used to initialize a declared array
- Set all array elements to 1

```
int nK, nCounter = new int[5];
for(nK=0; nK< 5 ; nK++)
  nCounter[nK] = 1;
```

- This is very useful for large arrays such as:

```
int nK, nCounter = new int[100];
for(nK=0; nK< 100 ; nK++)
  nCounter[nK] = 1;
```

nCounter[0]	1
nCounter[1]	1
nCounter[2]	1
nCounter[3]	1
nCounter[4]	1



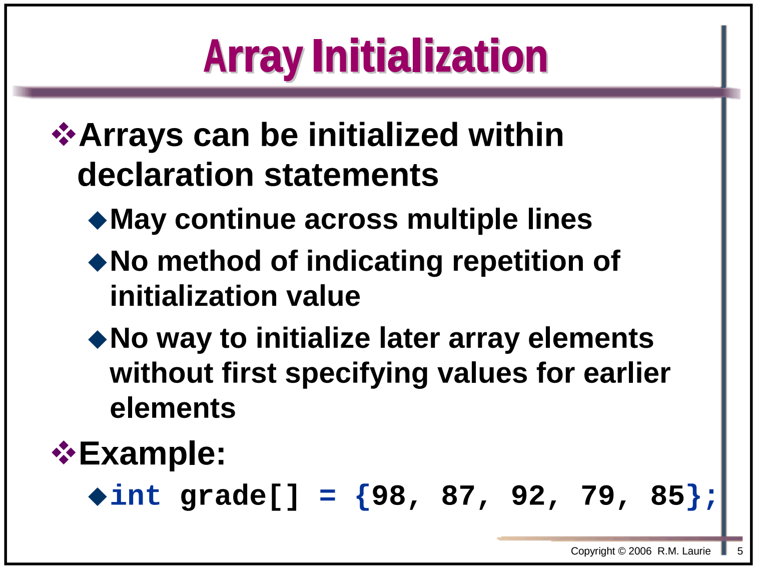
Array Bounds Checking

- Java requires an array element dimension

```
int nCounter = new int[100];
```

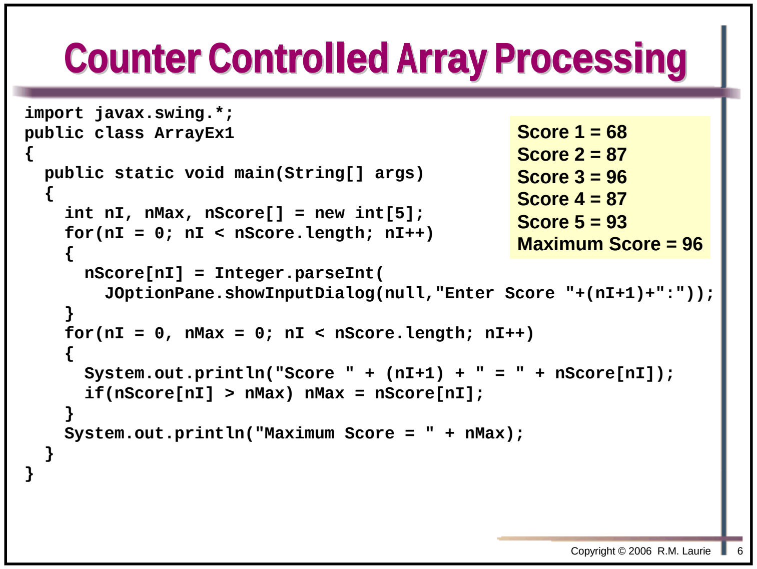
- Java Array Bounds Checking prevents the program from accessing an element that does not exist based on the dimension range
  - Will Result in a run time exception if attempting to access an element out of range
  - `ArrayIndexOutOfBoundsException`
- The array length property returns the total number of elements contained in an array.

```
for(nK=0; nK< nCounter.length; nK++)
     nCounter[nK] = 0;
```



Array Initialization

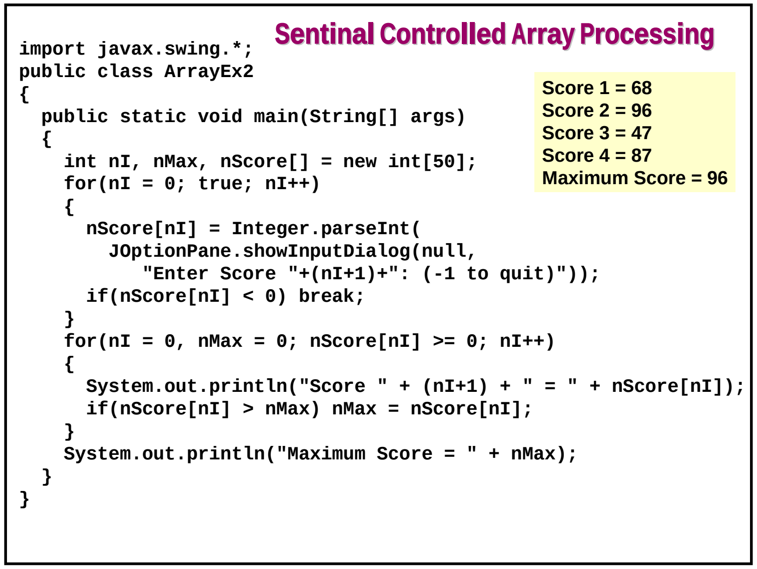
- Arrays can be initialized within declaration statements
  - May continue across multiple lines
  - No method of indicating repetition of initialization value
  - No way to initialize later array elements without first specifying values for earlier elements
- Example:
  - `int grade[] = {98, 87, 92, 79, 85};`



Counter Controlled Array Processing

```
import javax.swing.*;
public class ArrayEx1
{
  public static void main(String[] args)
  {
    int nI, nMax, nScore[] = new int[5];
    for(nI = 0; nI < nScore.length; nI++)
    {
      nScore[nI] = Integer.parseInt(
        JOptionPane.showInputDialog(null,"Enter Score "+(nI+1)+":"));
    }
    for(nI = 0, nMax = 0; nI < nScore.length; nI++)
    {
      System.out.println("Score " + (nI+1) + " = " + nScore[nI]);
      if(nScore[nI] > nMax) nMax = nScore[nI];
    }
    System.out.println("Maximum Score = " + nMax);
  }
}
```

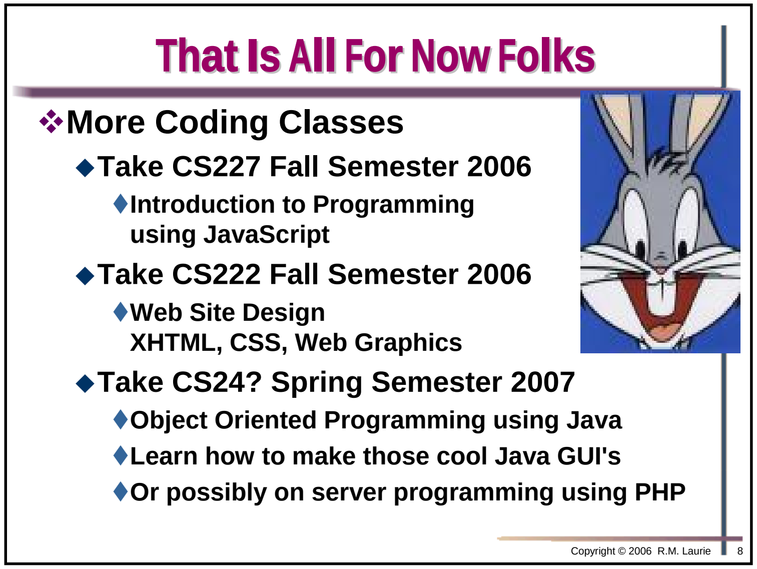
```
Score 1 = 68
Score 2 = 87
Score 3 = 96
Score 4 = 87
Score 5 = 93
Maximum Score = 96
```



Sentinal Controlled Array Processing

```
import javax.swing.*;
public class ArrayEx2
{
  public static void main(String[] args)
  {
    int nI, nMax, nScore[] = new int[50];
    for(nI = 0; true; nI++)
    {
      nScore[nI] = Integer.parseInt(
        JOptionPane.showInputDialog(null,
           "Enter Score "+(nI+1)+": (-1 to quit)"));
      if(nScore[nI] < 0) break;
    }
    for(nI = 0, nMax = 0; nScore[nI] >= 0; nI++)
    {
      System.out.println("Score " + (nI+1) + " = " + nScore[nI]);
      if(nScore[nI] > nMax) nMax = nScore[nI];
    }
    System.out.println("Maximum Score = " + nMax);
  }
}
```

```
Score 1 = 68
Score 2 = 96
Score 3 = 47
Score 4 = 87
Maximum Score = 96
```



That Is All For Now Folks

- More Coding Classes
  - Take CS227 Fall Semester 2006
    - Introduction to Programming using JavaScript
  - Take CS222 Fall Semester 2006
    - Web Site Design XHTML, CSS, Web Graphics
  - Take CS24? Spring Semester 2007
    - Object Oriented Programming using Java
    - Learn how to make those cool Java GUI's
    - Or possibly on server programming using PHP