JAVA Textbook

Chapter 8

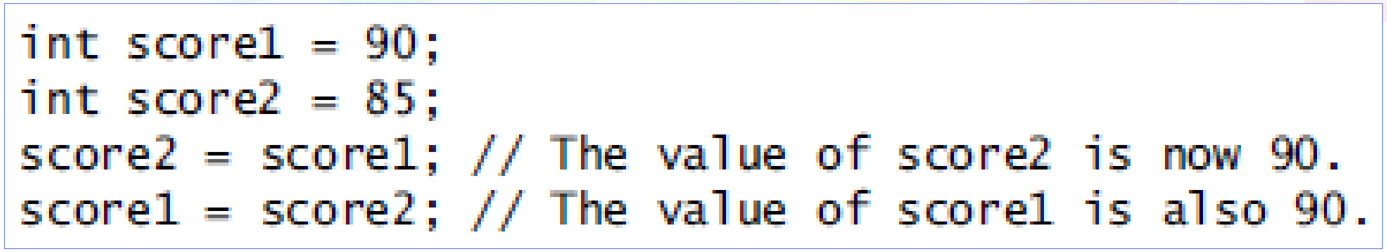
Advanced Array Techniques

Objectives

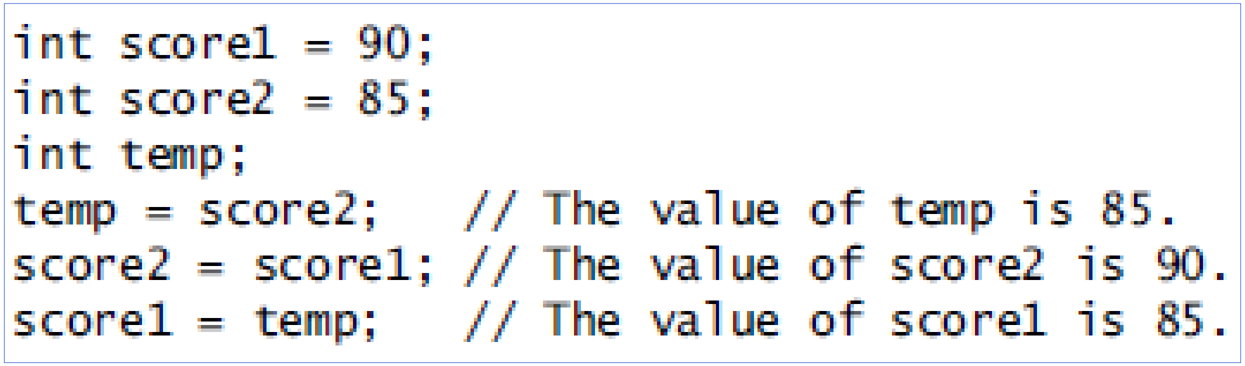
In this chapter, you will learn about:

- Swapping data values in a Java program.
- Creating a bubble sort in Java.
- Working with multidimensional arrays in Java.

Swapping Data Values



```
int score1 = 90;
int score2 = 85;
score2 = score1; // The value of score2 is now 90.
score1 = score2; // The value of score1 is also 90.
```



```
int score1 = 90;
int score2 = 85;
int temp;
temp = score2;   // The value of temp is 85.
score2 = score1; // The value of score2 is 90.
score1 = temp;   // The value of score1 is 85.
```

- Place the value stored in one variable into a second variable, and then place the value that was originally stored in the second variable in the first variable.
- Must create a third variable to temporarily hold one of the values to be swapped so that that

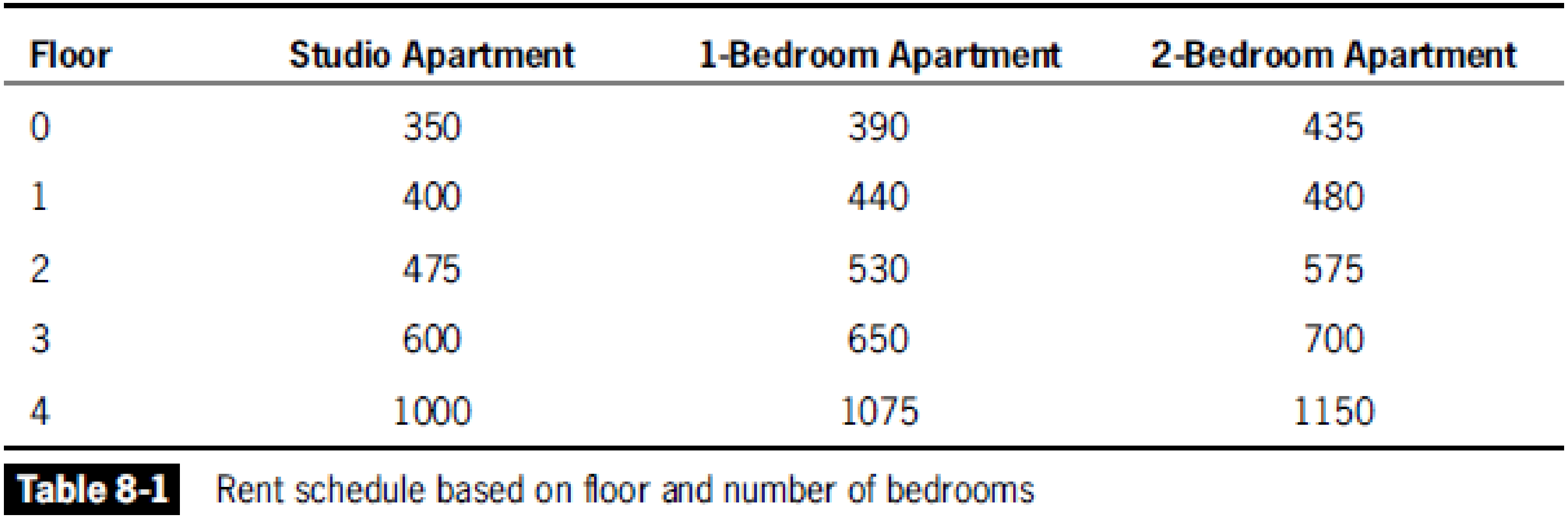
Using a Bubble Sort

- See example code *StudentScores.java* in the text (Figure 8-2).
- The example covers the following important topics discussed in the PLD lecture:
  - Sorting a list of variable size
  - Refining the baseline bubble sort algorithm to reduce unnecessary comparisons
  - Refining the baseline bubble sort to reduce unnecessary passes

Using Multidimensional Arrays

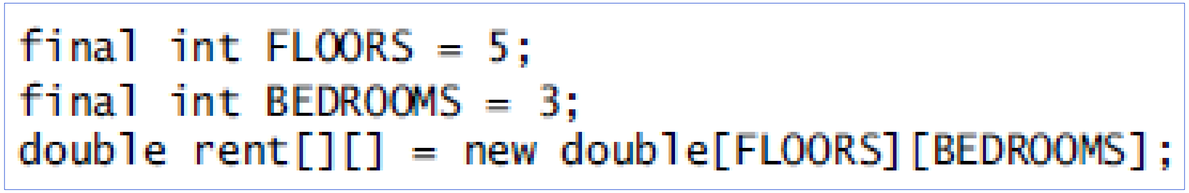
- An array whose elements are accessed using a single subscript is called a one-dimensional array or a single-dimensional array.
- A two-dimensional array stores elements in two dimensions and requires two subscripts to access elements.

Using Multidimensional Arrays

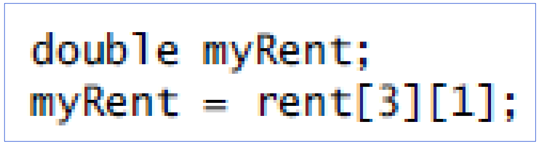


Floor	Studio Apartment	1-Bedroom Apartment	2-Bedroom Apartment
0	350	390	435
1	400	440	480
2	475	530	575
3	600	650	700
4	1000	1075	1150

Table 8-1 Rent schedule based on floor and number of bedrooms



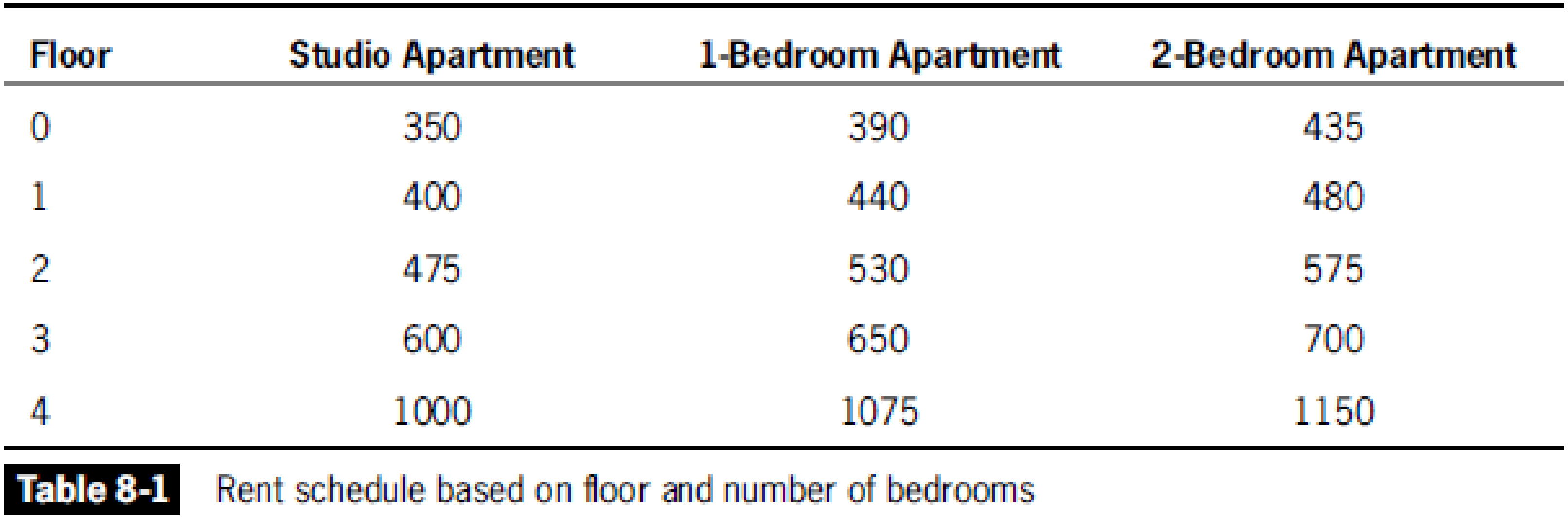
```
final int FLOORS = 5;
final int BEDROOMS = 3;
double rent[][] = new double[FLOORS][BEDROOMS];
```



```
double myRent;
myRent = rent[3][1];
```

- An example illustrating how to declare a two-dimensional array, and how to access an individual element in it.

Using Multidimensional Arrays



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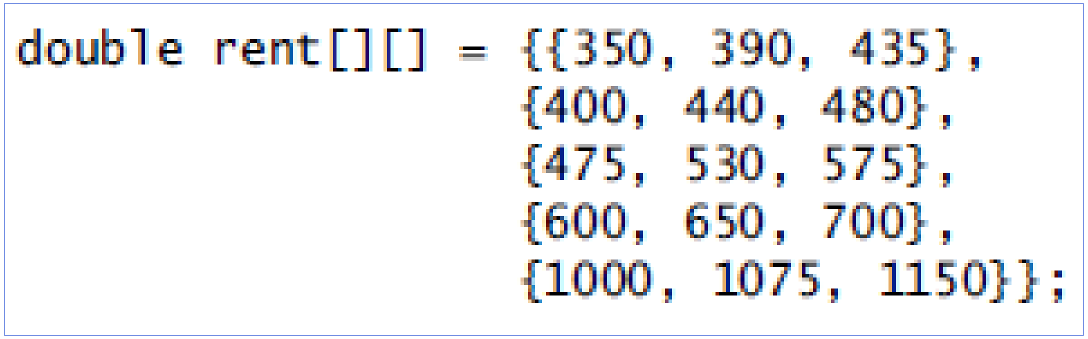
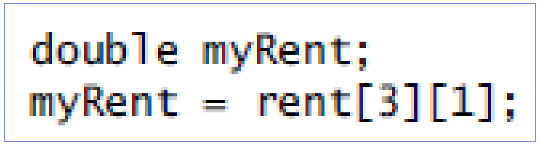


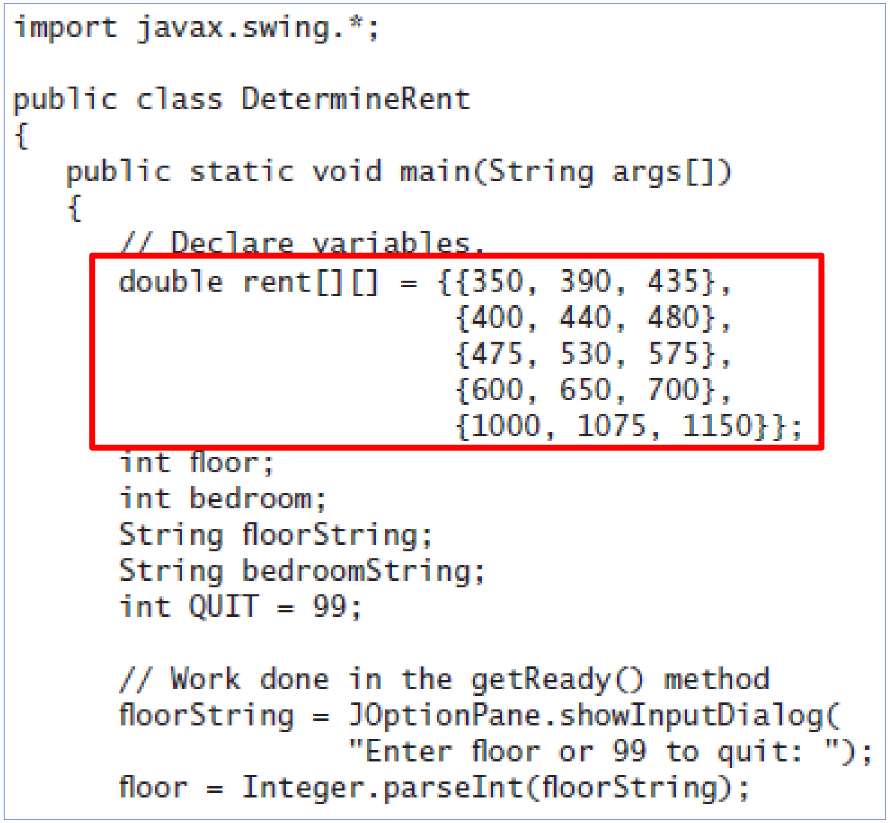
```
double rent[][] = {{350, 390, 435},
                   {400, 440, 480},
                   {475, 530, 575},
                   {600, 650, 700},
                   {1000, 1075, 1150}};
```



```
double myRent;
myRent = rent[3][1];
```

- An example illustrating how to declare a two-dimensional array with initialization, and how to

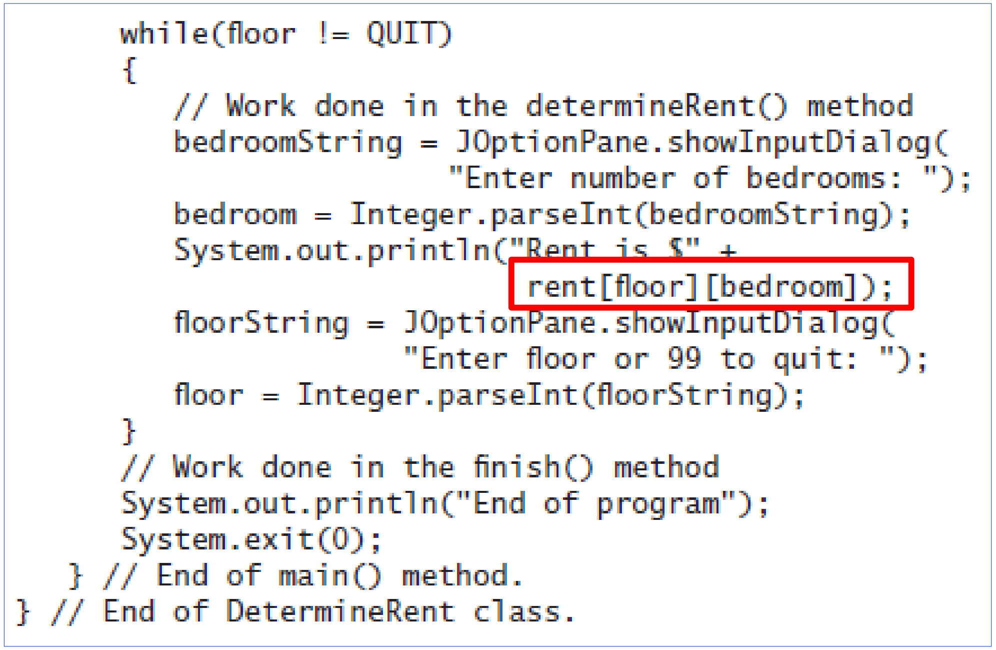
Using Multidimensional Arrays



```
import javax.swing.*;

public class DetermineRent
{
   public static void main(String args[])
   {
      // Declare variables.
      double rent[][] = {{350, 390, 435},
                         {400, 440, 480},
                         {475, 530, 575},
                         {600, 650, 700},
                         {1000, 1075, 1150}};
      int floor;
      int bedroom;
      String floorString;
      String bedroomString;
      int QUIT = 99;

      // Work done in the getReady() method
      floorString = JOptionPane.showInputDialog(
                   "Enter floor or 99 to quit: ");
      floor = Integer.parseInt(floorString);
```



```
      while(floor != QUIT)
      {
         // Work done in the determineRent() method
         bedroomString = JOptionPane.showInputDialog(
                        "Enter number of bedrooms: ");
         bedroom = Integer.parseInt(bedroomString);
         System.out.println("Rent is $" +
                            rent[floor][bedroom]);
         floorString = JOptionPane.showInputDialog(
                      "Enter floor or 99 to quit: ");
         floor = Integer.parseInt(floorString);
      }
      // Work done in the finish() method
      System.out.println("End of program");
      System.exit(0);
   } // End of main() method.
} // End of DetermineRent class.
```

- An example Java program that for determines rents.

Thank You!