**Chapter 7 Lab**

**Arrays**

**Lab Objectives**

 Be able to declare and instantiate arrays

 Be able to fill an array using a loop

 Be able to access and process data in an array

 Be able to write a sorting method

 Be able to use an array of objects

**Introduction**

Everyone is familiar with a list. We make shopping lists, to-do lists, assignment lists, birthday lists, etc. Notice that though there may be many items on the list, we call the list by one name. That is the idea of the array, one name for a list of related items. In this lab, we will work with lists in the form of an array.

It will start out simple with a list of numbers. We will learn how to process the contents of an array. We will also explore sorting algorithms, using the selection sort. We will then move onto more complicated arrays, arrays that contain objects.

**Task #1 Average Class**

1. Create a file called *YournameProjectSeven.java.* You will need to write code that allows a user to enter 6 scores into an array. It will then rearrange the data in descending order and calculate the mean for the data set.

2. After allocating an array of size six in the main method, you will need to write the following methods.

**enterGrades** — Use a for loop to repeatedly display a prompt for the user which should indicate that user should enter score number 1, score number 2, etc. Note: The computer starts counting with 0, but people start counting with 1, and your prompt should account for this. For example, when the user enters score number 1, it will be stored in indexed variable 0.

**selectionSort** — this method uses the selection sort algorithm to rearrange the data set from highest to lowest

**calculateMean** — this is a method that uses a for loop to access each score in the array and add it to a running total. The total divided by the number of scores (use the length of the array), and the result is stored into the mean and returned.

3. Display the array before and after the sort. You will also need to display the mean of the data set in an appropriate message.

**Task #2 Arrays of Strings**

1. Create a file YournameCompactDisc.java. Declare an array of Strings, called cd, with a size of 6.
2. Fill the array by creating a new song with the title and artist and storing it in the appropriate position in the array. You need to read this information from the file Classics.txt that is provided. You will need to read the title and the artist and merge them together before storing them into the array. You will need to merge the word “by” in between the two strings.
3. Print the contents of the array to the console.
4. Compile, debug, and run. Your output should be as follows:

Contents of Compact Disc

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Ode to Joy by Bach

The Sleeping Beauty by Tchaikovsky

Lullaby by Brahms

Canon by Bach

Symphony No. 5 by Beethoven

The Blue Danube Waltz by Strauss