# TEACHER’s guide

# Single Dimension Arrays

**OBJECTIVES:** The student will declare and create single-dimension arrays and use them in programs.

The student will solve the following fundamental algorithms for arrays: insertion, deletion, and traversal.

**ACTIVITIES/TIME:** Half Week

**MATERIALS:** Student Lesson A16: Single Dimension Arrays

Handout A16.1, *Example Program,* and *ArrayOps.java*

Lab Assignment A16.1, *Statistics*

Lab Assignment A16.1, Data File – *numbers.txt*

Lab Assignment A16.2, *Compact*

Lab Assignment A16.2, Data File – *compact.txt*

Worksheet A16.1*, Single Dimension Arrays Review*

Teacher’s Guide A16: *Single Dimension Arrays*

Lab Assignment A16.1 – Answers, *Statistic.java*

Lab Assignment A16.2 – Answers, *Compact.java*

Worksheet A16.1, *Answer Sheet*

**REFERENCES:**

**INSTRUCTOR**

**NOTES:** Arrays are objects in Java. You declare the reference and then instantiate using new. When created, the elements are initialized to default values: **0** for numeric, **false** for boolean and **null** for objects. If mArray and nArray are two array reference variables, then you can use the assignment operator to copy the reference mArray into nArray. Then both variables will reference the same array object.

Thus the following snippet of code will print out “6”.

int[] mArray = new int[5];

int[] nArray;

nArray = mArray;

nArray[0] = 6;

System.out.println(mArray[0]);

A limitation of Java arrays is that the size is fixed. The size can be set at compile time or at run time, but you have only one chance to set the size. This is very efficient and is the best choice if you know ahead of time how many elements are in the array. There are many times when the number of elements in an array can change.

Lab Assignment A16.1, *Statistics* is the same exercise used in Lab Assignment A15.3, *Statistics*. You may want to choose one or the other. Asking the students to write both really emphasizes the differences between ArrayList and arrays. Most students prefer the ArrayList, which is great!

Lab Assignment A16.2, *Compact* requires the use of a text file of integers. A file of 20 integers (*compact.txt*) is supplied.

**WORKSHEET**

**NOTES:** Array processing provides the foundation for many future topics; however, they can be difficult for the beginning computer science student. Worksheet A16.1, *Single Dimension Arrays Review* starts with a basic array example. It progresses to a more complex OOP activity where an array is used to store *continent* objects that are defined using the included Continent class. In each case, students are challenged to revise the code to enhance its output.