LAB 8 – Array

Objectives:

At the end of this lab, the students are able to:

i.   declare array reference variables and create single and two dimensional arrays
ii.   declare, create, and initialize an array using an array initializer
iii.   program common array operations (displaying arrays, summing all elements, finding min and max elements, random shuffling, shifting elements)
iv.   develop and invoke methods with array arguments and returnvalue

8.1   Activity 1

8.1.1   Objective

Writing pseudocode and Java program in order to find the maximum number from a single dimensional array.

8.1.2   Problem Description

Design a pseudocode and write a Java program that should be able to occupy five integer elements by creating an array. The value of each element is obtained from the user. From these values, the program also should be able to identify and display the maximum value, as well as display the list of array.

[EstimatedTime:30minutes]

8.2   Activity 2

8.2.1   Objective

Writing pseudocode and Java program by implementing a single dimensional array

8.2.2   Problem Description

Design a pseudocode and write a Java program that reads student scores, gets the best score from the student scores, and then assigns grades based on the following scheme:

Grade is A if score is >= best - 10;
Grade is B if score is >= best - 20;
Grade is C if score is >= best - 30;
Grade is D if score is >= best - 40;
Grade is F otherwise.

The program prompts the user to enter the total number of students, then prompts the user to enter all of the scores, and concludes by displaying the grades.

[Estimated Time: 30 Minutes]

8.3   Activity 3

8.3.1   Objective

Writing pseudocode and Java program by implementing a single dimensional array

8.3.2   Problem Description

Design pseudocode and write a Java program that declares an array alpha of 50 elements of type double. Initialize the array so that the first 25 elements are equal to the square of the index variable, and the last 25 elements are equal to three times the index variable. Output the array so that 10 elements per line are printed.

[Estimated Time: 30 Minutes]

8.4   Activity 4

8.4.1   Objective

Writing pseudocode and Java program by implementing two dimensional array

8.4.2   Problem Description

Design a pseudocode and write a Java program that create two dimensional array integer that represents the information as student id and marks respectively as shown in the figure below. The program should be able to find and display the total marks for each students.

Student ID	Mark 1	Mark 2	Mark 3	Mark 4
1	78	90	40	75
2	90	83	75	68
3	40	80	53	69
4	75	80	98	95
5	64	50	41	70

[Estimated Time: 45 Minutes]

8.5   Activity 5

8.5.1   Objective

Writing pseudocode and Java program by implementing two dimensional array

8.5.2   Problem Description

Design a pseudocode and write a program that uses a two-dimensional array to store the highest and lowest temperatures for each month of the year. The program should output the average high, average low, and highest and lowest temperatures of the year.

[Estimated Time: 45 Minutes]