Lab 12

Single dimension array

Name-Surname.....Student No.....Section (LAB).....

Lab instruction

1. Write the java program following the example.

   AnalyzeNumbers.java is a program that can assign the number of array by input an integer. The program will ask user to input the number to store in an array. Summary, average, and number which above average will finding in the program

```java
public class AnalyzeNumbers {
  public static void main(String[] args) {
    java.util.Scanner input = new java.util.Scanner(System.in);
    System.out.print("Enter the number of items: ");
    int n = input.nextInt();
    double[] numbers = new double[n];
    double sum = 0;

    System.out.print("Enter the numbers: ");
    for (int i = 0; i < n; i++) {
      numbers[i] = input.nextDouble();
      sum += numbers[i];
    }

    double average = sum / n;

    int count = 0; // The number of elements above average
    for (int i = 0; i < n; i++)
      if (numbers[i] > average)
        count++;

    System.out.println("Average is " + average);
    System.out.println("Number of elements above the average is "
      + count);
  }
}
```

2. Run and test the program.

3. Modify the program to show all numbers and finding the maximum and minimum value in the array.

**********CHECK POINT #1**********

4. Modify the program from check point#1 by using the method printArray(), findMax(), findMin(). The program will invoke method to get the result.

**********CHECK POINT #2**********

5. Write the program to store the student's score by using one dimension array. There are 100 students in the classroom. Assign integer number as a score to each student randomly (0-100) and evaluate the grade for each student by the criteria in Table 1. Count the number of student get each grade and show the report on screen.

Score	Grade
100-80	A
70-79	B
60-69	C
50-59	D
0-49	F

Table 1.

```
Student got A >>24
Student got B >>11
Student got C >>8
Student got D >>7
Student got F >>50
PS C:\Users\kittitouch\Documents\javacode>
a } ; if ($?) { java StudentArrayGrade }
Student got A >>18
Student got B >>9
Student got C >>10
Student got D >>15
Student got F >>48
Total student>>100
```

Sample run

**********CHECK POINT #3**********

6. Compute the mean and standard deviation of number by following formulas.

$$mean = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

$$deviation = \sqrt{\frac{\sum_{i=1}^{n}(x_i - mean)^2}{n-1}}$$

To compute deviation with this formula, you have to store the individual numbers using an array, so that they can be used after the mean is obtained. Use {1,2,3,4,5,6,7,8,9,10} to test the method.

Your program should contain the following methods:

```
/**Method for computing deviation of double values*/
public static double deviation(double[] x)
```

```
/**Method for computing deviation of int values*/
public static double deviation(int[] x)
```

```
/**Method for computing mean of an array of double values*/
public static double mean(double[] x)
```

```
/**Method for computing mean of an array of int values*/
public static double mean(int[] x)
```

**********CHECK POINT #4**********

----------END OF LAB----------