EGN3211 Homework #4 - read all the way till “END OF REQUIREMENTS”

* Use only concepts covered up to (and including) chapter 5.
* Submit one document containing all there parts 4A and 4B

**Failure to demostrate the implementation of the program specifically the required input and output will result in serious deduction of points.**

**Problem 4A (10 points)**

Develop a C program that will perform the following operations on an array containing grades by using appropriate functions. Use the array elements (as shown in the output) in the main program and call the respective functions. The main function should print the array values before the array change and array values after the array change.

The three different functions respectively should

1. calculate the standard deviation and return the standard deviation.
2. add the standard deviation (use the integer portion after rounding) to each of the original array elements. If the new value exceeds 100, the final value should be limited to 100.
3. Sort the array using modified bubble sort. The bubble sort presented in Fig 6.15 of the text is inefficient. Instead of making the same number of comparisons for every pass, modify it so that for every succesive pass, it makes one less comparison from the previous pass.

**The expected output of the program**

|  |
| --- |
| Exam scores: 80 82 90 95 90 87 92  Standard deviation: 4.9857  Adjusted exam scores: 85 87 95 100 95 92 97  Sorted exam scores: 85 87 92 95 95 97 100 |

Use float data type and printf(“.0f”) when printing the values of array to round up.

Use the following formula to calculate the standard deviation



Note: Might be easier if you break the formula into smaller equations/formulas and build the desired formula by combining the smaller equations/formulas.

**Problem 4B (10 points)**

Develop a C program that will detect palindrome for a set of integers stored in an array.

At minimum, use the following arrays in your code for your program execution.

myArray1[]={1,2,3,2,1};

myArray2[]={1,2,3,4,1};

myArray3[]={1,2,3,3,2,1};

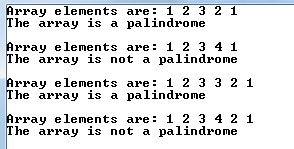
myArray4[]={1,2,3,4,2,1};

For the given array sets, myArray1 and myArray3 are palindrome.

Implement the following three functions to detect palindrome. These functions should be called from main to perform the necessary operation.

|  |
| --- |
| createReserveArray  Reverses the array elements and copy to another array |
| compareArray  Compares two arrays and return 0 if the arrays are the same, otherwise return a non-zero. Use this return value in the main program to print out the status of the array (palindrome or not) |
| printArray  Prints the array values. |

The expected output of the program



Your output should contain at least the above 4 arrays.

END OF REQUIREMENTS