Lab Assignment, COL100

1. Write a C program that creates two integer arrays A and B of size 10 each. The program takes input from the user to populate both arrays. It then sorts each array in ascending order. The program finally merges A and B into a new array called Merge (of size 20), such that Merge contains all the elements of A and B and is itself sorted in ascending order. Make use of the fact that A and B are already sorted to efficiently populate Merge.

2. Write a C program which creates two arrays of type double of size 3: Vec1, and Vec2. Each array stores the x, y, and z coordinates of two 3-dimensional vectors. The program takes the coordinates of both vectors as input from the user and prints out (i) the sum of the two vectors, and (ii) the cosine of the angle between the two vectors.

3. Write a C program which takes input from the user into an integer array of size 15. The program then rearranges the elements of the array such that all negative numbers in the array appear before all non-negative integers. Note that the array need not be sorted, only the negative numbers must appear first. The program should then print out the contents of the array after rearranging the elements. You should not use a second array to accomplish this task.

Example: After user input A={-5, 7, 8, 9 , 12, -4, -7, 2, 4, 77, -88, 99, 10, 1, 0}
After rearrangement A={-5, -88, -4, -7, 7, 8, 9, 10, 1, 77, 99, 12, 0, 2, 4}

4. Write a C program which takes input from the user into an integer array of size 15. The program prints out all unique elements of the array.

Example: After user input array A={1, 3, 6, 7, 8, 2 , 5, 6, 8, 9, 3, 4, 5, -1, -9}
Output: Unique elements are: 1, 3, 6, 7, 8, 2, 9, 5, -1, -9

5. Write a C program which keeps reading in names (all small letters only) from the user as strings. When the user enters an empty string, by just hitting the <ENTER> key on the keyboard, then the program prints out the last name when all names are compared in lexicographic order.

Example:

User Inputs: ravi
               nishank
               vinay
               rahul
               <ENTER>
Output: The last name in lexicographic order is: vinay