National Institute of Technology Calicut
Department of Computer Science and Engineering
Third Semester B. Tech.(CSE)
CS2092D Programming Laboratory
Assignment 4 Modification

Naming Conventions for Submission

The source codes must be named as:

ASSG<NUMBER>_<ROLLNO>_<FIRST-NAME>_MOD.c

(For example: $ASSG1\_BxxyyyyCS\_LAXMAN\_1.c$). If you do not conform to the above naming conventions, your submission might not be recognized by our automated tools, and hence will lead to a score of 0 marks for the submission. So, make sure that you follow the naming conventions.

Standard of Conduct

- Violation of academic integrity will be severely penalized. Each student is expected to adhere to high standards of ethical conduct, especially those related to cheating and plagiarism. Any submitted work MUST BE an individual effort. Any academic dishonesty will result in zero marks in the corresponding exam or evaluation and will be reported to the department council for record keeping and for permission to assign F grade in the course. The department policy on academic integrity can be found at: http://cse.nitc.ac.in/sites/default/files/Academic-Integrity_new.pdf.

QUESTION

1. In a school assembly, the teacher noticed that the students in a class were not standing in the correct order. The teacher then directed the stu- dents to arrange themselves in non-decreasing order based on their height. The students utilized the Quick Sort algorithm for a more efficient rearrangement. Determine the count of students who were already correctly positioned according to their height before the rearrangement. Note:- Ensure that the partitioning is a 3-way partitioning, similar to con- ventional quick sort, with the distinction being the creation of three par- titions. The first partition contains elements that are less than the pivot element, the second partition contains elements that are equal to the pivot element, and the third partition contains elements that are greater than the pivot element. You can choose the element in the middle position as the pivot element. You cannot use sorting for the purpose of partitioning.

   Input Format:

   - The first line contains an integer n within the range [1, 10^4], indicating the total number of students in the class.
   - The second line lists the n elements as space-separated real numbers within the range [100, 250], representing the heights in centimeters

   Output Format:

   - A single line containing an integer value within the range [0, 104] that indicates the total number of students who were correctly positioned before the rearrangement. .

   Sample Input 1:
   6
   140.5 160 150 165 163.2 100
   Sample Output 1:
   2

   Sample Input 2:
   4

150 157 157.5 170
Sample Output 2:
4