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Department of Artificial Intelligence
Data Structure (AI102)
B.Tech I - II Semester Assignment-
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1. You are given a text file, named “students.txt” that contains students’ records. Each Line contains information of a single student in the form of <Student Name, Roll No, Department>.
 - A. Read the records from the file into an array of structures.
 - B. Three Options will turn up: (1) Bubble Sort, (2) Binary Search, and (3) Quit. In the following we describe what your C/C++ program will do on Selecting the options.
 - (1) Bubble Sort: Sorts the records based on Student Name. If more than One students has the same name, then sort them on their roll no.
 - (2) Binary Search: Given a student name, the function will return all the Student records <Student Name, Roll No, Department> having the Student name.
 - (3) Quit: Exit the program.
2. Let $A[n]$ be an array of n distinct integers. If $i < j$ and $A[i] > A[j]$, then the pair (i, j) Is called an inversion of A . Write a C/C++ program that determines the number of Inversions in any permutation on n elements in $O(n \lg n)$ worst-case time. (Hint: Modify merge sort)

Example: $A = \{4, 1, 3, 2\}$ output is 4