Heaven's Light is Our Guide
Department of Computer Science & Engineering, RUET
Task-2, Due: Next Lab day

Problem 1: Counting Comparisons

In class, we learned that searching over collections of data is one of the most commonly-used operations in computing. Here, we will explore the complexity of linear search and binary search algorithms. In this lab, we assume that the time complexity of an algorithm is the number of comparisons it has to make, as a function of the problem size (i.e., list size). Thus you will need to modify the search methods to keep track of the number of comparisons that are made.

You need to design two methods linear_search(a, n) and binary_search(a, n) where **a** is data structure that contains input data and **n** is the size of a. Hence n can never be less than **10000**.

Sample input

Input **search.txt** contains the input as follows. The file contains data which are generated randomly and written to a text file **search_i.txt**. Hence i=1, 2, 3, 4, 5. You need perform the same test with different values of **n** (i.e., 10000, 20000, 30000, 40000, 50000) stored in **search_i.txt**.

-999 10 16 76 80 111 178 190.....

Sample output
Key: 7 Value: 190 Total steps: xxx

Your program should show a message missing value if the data is not found.

Report:

Your lab report should contain the followings

1. Introduction
2. Computer Algorithm/pseudo code
3. Flow chart
4. Sample input
5. Sample Output
6. Analysis of the complexity
7. Conclusion (Focus on the strong and weak points of the algorithm studied)