**CS 303 – Lab 1**

**Objectives:**

* Review programming in a high-level language
* Implement linear search and binary search algorithms
* Evaluate performance of linear and binary search

**In-class Assignment:**

1. Implement a method that will search a given array using the linear search algorithm.
2. Implement a method that will search a given array using a recursive binary search algorithm.
3. Write a driver program to test the methods implemented in questions 1-2. Note that you have to sort the input array before using the binary search algorithm, you can use any sort method available (*e.g.,* sort method in the Java Collection Framework).

**Homework Assignment:**

1. Test the program for array sizes N = 16, 32, 64, 128, 256, 512, 1024, 2048, ……, 225. Initialize the array with random numbers between the ranges 1 through N and use the same array for testing linear search and binary search. Remember to sort the array before using binary search. Use a text file with 1,000 random numbers in the range 1 through 225 as the search keys.
2. Compare the execution time for linear search and binary search. Include the time taken for sorting with the binary search time (you have to sort only once for each array size). Use a table or plot to summarize the results and document your observations and explanations in the report.

Sample input files are available here

Check the Canvas Files / Documents for the Sample report and create a similar report format.

Try to finish in class assignment part before the lab is over, I suggest you to start working on the lab assignments before you come to the lab.

If you have any questions about homeworks, report, the course structure…etc, feel free to ask your TA or Instructor

Good Luck ☺