CMPS 2200 Recitation 01
Answers

Name:_____Orville Cunningham_____
Name:_____

Place all written answers from `recitation-01.md` here for easier grading.

- **4)** Describe the worst case input value of `key` for `linear_search`? for `binary_search`?

Worst for linear search and binary search

if the key is not present in the list

- **5)** Describe the best case input value of `key` for `linear_search`? for `binary_search`?

Best case for linear search - if the key is present in the first index

Best case for binary search – if the key is at the middle of the list

- **8)** Call `print_results(compare_search())` and paste the results here:

n	linear	binary
10.000	0.004	0.009
100.000	0.012	0.006
1000.000	0.151	0.019
10000.000	1.549	0.021
100000.000	11.081	0.018
1000000.000	87.398	0.044
10000000.000	861.352	0.026

- **9)** Do the theoretical running times match your empirical results?

Mostly it does match but it does not match perfectly because if you look at binary search it’s not increasing constantly.

- **10a)** What is worst-case complexity of searching a list of n elements k times using linear search? k

- **10b)** For binary search? nlog(n) + $\log_2(k)$

- **10c)** For what values of k is it more efficient to first sort and then use binary search versus just using linear search without sorting? You may assume that your sorting algorithm runs in O(n \lg n) time.

When k is equal to n it is more efficient to first sort and then use binary search.