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\* Name: Devin Brown

\* LU ID: L20470168

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\* Partner Name: Daniel Nix

\* Partner LU ID: L20470231

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\* Hours to complete assignment (optional): 6+

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\* Describe how your firstIndexOf() method in BinarySearchDeluxe.java

\* finds the first index of a key that equals the search key.

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It first checks for an OutOfBounds index, then checks if the key is index 0 if it is then it will return 0. Then the program uses a binary search that was implemented via the while loop checking for the location of the key. If it does not find that key’s value then it returns ‘-1’.

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\* What is the order of growth of the number of compares (in the

\* worst case) that each of the operations in the Autocomplete

\* data type make, as a function of the number of terms N and the

\* number of matching terms M?

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\* Recall that with order-of-growth notation, you should discard

\* leading coefficients and lower order terms, e.g., M^2 + M log N.

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constructor: worst case should run linear plus Mergesort time, so in big O notation: O((nlgn)+ n) which simplified is O(nlgn).

allMatches(): worst case runs linear (M) plus Mergesort time (M), so in big O notation: O(mlgm + m) which simplified is O(mlgm).

numberOfMatches(): worst case runs 1 plus BSD.lastIndexOf + BSD.firstOf and both last & first run O(lgn) time, so in big O notation: O(2(lgn) + 1) which simplified is O(lgn).

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\* Known bugs / limitations.

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The only limitation we had both found was that the program is case sensitive.

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\* Describe whatever help (if any) that you received.

\* Don't include readings and lectures, but do

\* include any help from people (including course staff, lab TAs,

\* classmates, and friends) and attribute them by name.

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\* Also include any resources (including the web) that you

\* may have used in creating your design.

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Me and my partner worked together on figuring out the most effective ways to implement the best sorting algorithm to us. We ended up going with mergesort because it is stable and has a good runtime. Websites like stackoverflow and the book additive site were also a big help.

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\* Describe any serious problems you encountered.

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We had a problem with our BSD class at first but eventually fixed our problem. So overall I would say no serious issues.

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\* If you worked with a partner, assert below that you followed

\* the protocol as described on the assignment page. Give one

\* sentence explaining what each of you contributed.

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We followed the protocol as described on the assignment page and split responsibility for functions of autocomplete.java, term.java, and BinarySearchDeluxe.jave. Once we had time to fully work together, we combined our individual progress for a completed result and tested out any bugs.

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\* List any other comments here. Feel free to provide any feedback

\* on how much you learned from doing the assignment, and whether

\* you enjoyed doing it.

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I enjoyed first hand seeing, and then doing, one of the many ways all of the sorting algorithms we’ve discussed can actually be implemented into a program. I’ve also always been curious about how search engines actually worked so getting to learn about such a huge aspect of it was very interesting to me.