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\* Name:

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\* Partner Name:

\* Partner NetID:

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\* Hours to complete assignment (optional):

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\* Describe concisely the data structure(s) you used to store the

\* information in synsets.txt. Why did you make this choice?

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/We decided to use a Hash map to keep track of connections within

We also decided to use an ArrayList to keep track of multiple inputs that correspond to one key. The main reason for using this instead of a HashSet is that, although HashSets prevent duplicates the data being inputted won’t contain duplicates. Considering the data inputted is already sorted, using an ArrayList then increases the range of functionality by allowing the use of binary search if needed.

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\* Describe concisely the data structure(s) you used to store the

\* information in hypernyms.txt. Why did you make this choice?

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/ We had originally used another hash map to keep track of these connections as well, but realized that it was possible to directly input the data into a directed graph. Seeing as the digraph was already required for the project we decided to only use this data structure to save space and time.

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\* Describe concisely the algorithm you use in the constructor of

\* ShortestCommonAncestor to check if the digraph is a rooted DAG.

\* What is the order of growth of the worst-case running times of

\* your algorithms as a function of the number of vertices V and the

\* number of edges E in the digraph?

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Description:

Order of growth of running time:

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\* Describe concisely your algorithm to compute the shortest common

\* ancestor in ShortestCommonAncestor. What is the order of growth of

\* the running time of your methods as a function of the number of

\* vertices V and the number of edges E in the digraph? What is the

\* order of growth of the best-case running time?

\*

\* If you use hashing, you should assume the uniform hashing assumption

\* so that put() and get() take constant time.

\*

\* Be careful! If you use a BreadthFirstDirectedPaths object, don't

\* forget to count the time needed to initialize the marked[],

\* edgeTo[], and distTo[] arrays.

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Description:

running time

method best case worst case

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length(int v, int w)

ancestor(int v, int w)

length(Iterable<Integer> v,

Iterable<Integer> w)

ancestor(Iterable<Integer> v,

Iterable<Integer> w)

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\* Known bugs / limitations.

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

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

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

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

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1. <https://docs.oracle.com/javase/7/docs/api/java/util/package-summary.html>
2. <http://www.java67.com/2013/01/difference-between-set-list-and-map-in-java.html>
3. <https://introcs.cs.princeton.edu/java/stdlib/In.java>
4. <https://algs4.cs.princeton.edu/42digraph/Digraph.java.html>
5. <http://www.java67.com/2014/01/how-hashset-is-implemented-or-works-internally-java.html>

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\* Describe any serious problems you encountered.

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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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\* 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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