

CSCI3160: Special Exercise Set 7

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Problem 1. Consider applying the algorithm discussed in the class to calculate the edit distance between strings $s = \text{“honda”}$ and $t = \text{“pony”}$. Recall that the algorithm fills in a matrix. Show the values for all the cells in the matrix.

Problem 2. Prove: the edit distance between a string s and the empty string is at most $|s|$.

Problem 3. Prove: the edit distance between a string s and the empty string is at least $|s|$.

Problem 4. Let s and t be two strings of lengths m and $m + 1$, respectively. Give an $O(m)$ time algorithm to determine whether t can be converted from s by inserting a single letter.

Problem 5. Let s and t be two strings of length m , respectively. Give an $O(m)$ time algorithm to determine whether t can be converted from s by replacing a single letter.

(Remark: Problems 4 and 5 together imply that you can check whether two strings have edit distance at most 1 in time proportional to their total length).