

Assignment 5

CS 581

Due November 20, 2018

Problem 1 [10 point] Show that the Complexity Class P is closed under the Kleene star operation. (Hint: Use dynamic programming. On input $y = y_1 \dots y_n$ for $y_i \in \Sigma$, build a table indicating for each $i \leq j$ whether the substring $y_i \dots y_j \in A^*$ for any $A \in P$.)

Problem 2 [10 point] State the Travelling Salesman problem as a decision problem and show that it is an element of NP . (Note that the optimization version of TSP is not an element of NP)

Problem 3 [10 point] Show that the Complexity Class NP is closed under concatenation.