No collaboration on this assignment. If you use material from other sources, sources must be cited.

1) Show that in the matrix chain multiplication problem, the greedy algorithm of performing the cheapest multiplication next does not always give the optimal sequence of multiplications.

2) Show that in the matrix chain multiplication algorithm, it is possible for the optimal breakpoint of M_{in} to be larger than the optimal breakpoint of M_{i+1n}. This is why the optimization used for the optimal binary search tree algorithm cannot be used for the matrix chain multiplication algorithm

3) In the sawmill problem, you are given a piece of wood, and a set of n cuts which you wish to make on the piece of wood. The price of cutting a piece of wood is 1 dollar per foot of total length of the current piece of wood you are cutting.

Design an algorithm for finding the optimal order of cuts. Use dynamic programming; I guarantee that a greedy strategy will not work. The algorithm is very similar to the matrix chain multiplication algorithm.

4) Show that the greedy algorithm of always choosing cuts as close to the center of the board as possible will not always give the optimal order of cuts for the sawmill problem