

CS 312: Algorithm Analysis

Homework Assignment #15

Show all work neatly.

Question 1: (5) You are given five matrices with the following dimensions:

- M_1 : 20×5
- M_2 : 5×10
- M_3 : 10×12
- M_4 : 12×6
- M_5 : 6×25

You wish to compute the product of the matrix chain $M_1 M_2 M_3 M_4 M_5$. What is the optimal (minimal) number of scalar multiplications required to compute this product? Use dynamic programming to compute the answer and show your work.

Question 2: (5) For the following graph, step through Floyd's algorithm (Floyd-Warshall), showing the D matrix at each step, and report the resulting shortest paths between all pairs of vertices.

