CSCI 303 Algorithms

Homework 12

Due: 11:00 in class, December 6, 2001

1. (10 points) Show by counter examples that none of the following greedy algorithms for chained matrix multiplication works. At each step

   (a) Compute the cheapest multiplication.

   (b) Compute the most expensive multiplication.

   (c) Compute the multiplication between the two matrices M_i and M_{i+1} such that the number of columns in M_i is minimized.

2. (10 points) What is the optimal way to compute $A_1A_2A_3A_4A_5A_6$, where the dimensions of the matrices are: $A_1 : 10 \times 20$, $A_2 : 20 \times 1$, $A_3 : 1 \times 40$, $A_4 : 40 \times 5$, $A_5 : 5 \times 30$, $A_6 : 30 \times 15$? To answer the question, you must first use dynamic programming to build the 6×6 table.