

Business Decision Analytics under Uncertainty

Spring 2017, Professor Eckstein

Homework 4

Due Wednesday, March 1

Solve each problem by hand using dynamic programming. For each problem, give a definition of the “value function” $f_t(i)$, show all your work in solving the problem, and state the optimal solution and its objective value. As an example of the definition of $f_t(i)$, for the knapsack problem with n items the definition it would be “the maximum value that can be derived by packing some subset of items t through n into a knapsack capable of holding i pounds.” You do not have to write an abstract recursion defining f_t in terms of f_{t+1} (although you may certainly do so if you wish).

Q1: Shortest Path

Problem 1 on pages 225 of the textbook. State all shortest paths from node 1 to node 10 (there should be 3) and the shortest path from node 3 to node 10.

.

Q2: Allocating Patrol Cars

Problem 4 on page 242 of the textbook. Your objective value is to minimize the total number of crimes in the city. What allocation of patrol cars accomplishes this objective?