CS/MCS 401 - Fall 2026 — Jonathan Liu
Lecture 21 Worksheet: Knapsack

L21

Problem 1 (Knapsack Recurrence) *Pick one of the subproblems on the slide, and use it to write a recurrence relationship. If you're done, try writing another! Two of these subproblems will work.*

Problem 2 (Knapsack Recurrence) *Assume, instead, that there were infinite copies of each item. Following the same steps, design a Dynamic Programming algorithm for that problem. If you're done, think about how you'd write algorithms for the others! Can any of them be solved without dynamic programming?*

Problem 3 (Proof of Correctness) *Write a formal proof that the knapsack algorithm is correct. In particular, prove that the entries in the array are all correct.*