

R-5.1 Let $S = \{a, b, c, d, e, f, g\}$ be a collection of objects with benefit-weight values as follows: $a:(12,4)$, $b:(10,6)$, $c:(8,5)$, $d:(11,7)$, $e:(14,3)$, $f:(7,1)$, $g:(9,6)$. What is an optimal solution to the fractional knapsack problem for S assuming we have a sack that can hold objects with total weight 18? Show your work.

R-5.3 Suppose we are given a set of tasks specified by pairs of the start times and finish times as $T = \{(1,2), (1,3), (1,4), (2,5), (3,7), (4,9), (5,6), (6,8), (7,9)\}$. Solve the task scheduling problem for this set of tasks.

R-5-11 Solve Exercise R-5.1 for the 0-1 Knapsack Problem.

R-5-12 Sally is hosting an Internet auction to sell n widgets. She receives m bids, each of the form “I want k_i widgets for d_i dollars,” for $i = 1, 2, \dots, m$. Characterize her optimization problem as a knapsack problem. Under what conditions is this a 0-1 versus fractional problem?