Problem Solving Homework (Week 8)

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JH Chapter 4

4.3.4.9

Proof. Alike what is proved in Lemma 4.3.4.8

$$R(I, \epsilon) \leq 1 + \frac{d(1+\delta)}{cost(T^*)}$$

$$\leq 1 + \frac{\epsilon(1+\delta)\sum_{i \in T} w_i}{\sum_{i \in T^*} c_i}$$

$$\leq 1 + \frac{\epsilon(1+\delta)\sum_{i \in T} w_i}{\sum_{i \in T^*} w_i}$$

$$\leq 1 + \epsilon(1+\delta)^2$$

□

4.3.4.13

1 Given $\epsilon > 0$, let $K = \frac{\epsilon W}{n}$
2 For each object i, define $w_i' = \left\lfloor \frac{w_i}{K} \right\rfloor$
3 With w' as profits, using the dynamic programming algorithm,
   find the most profitable set, say S'
4 Output S'

$$d = \frac{\epsilon C}{(1+\epsilon) n} \qquad 4.3.4.12$$