

CS375 Small Assignment 13

Due Dec 5th 10PM ET

(This question is from CLRS: 27.1-2) Imagine that you decide to take up downhill skiing. Suppose that a pair of skis costs r dollars to rent for a day and b dollars to buy, where $b > r$. If you knew in advance how many days you would ever ski, your decision whether to rent or buy would be easy. If you'll ski for at least $\lceil \frac{b}{r} \rceil$ days, then you should buy skis, and otherwise you should rent. This strategy minimizes the total that you ever spend. In reality, you don't know in advance how many days you'll eventually ski. Even after you have skied several times, you still don't know how many more times you'll ever ski. Yet you don't want to waste your money. Give and analyze an algorithm that has a competitive ratio of 2, that is, an algorithm guaranteeing that, no matter how many times you ski, you never spend more than twice what you would have spent if you knew from the outset how many times you'll ski.