

## 20.9 Buying and Selling stocks

We are given an array of  $n$  integers representing stock prices on a single day.

day	0	1	2	3	4
cost	5	10	4	6	12

We want to find a pair (buyDay, sellDay), with buyDay  $\leq$  sellDay, such that if we bought the stock on buyDay and sold it on sellDay, we would maximize our profit.

{buyDay 2, sellDay 4} = profit = (12 - 4 = 8\$)

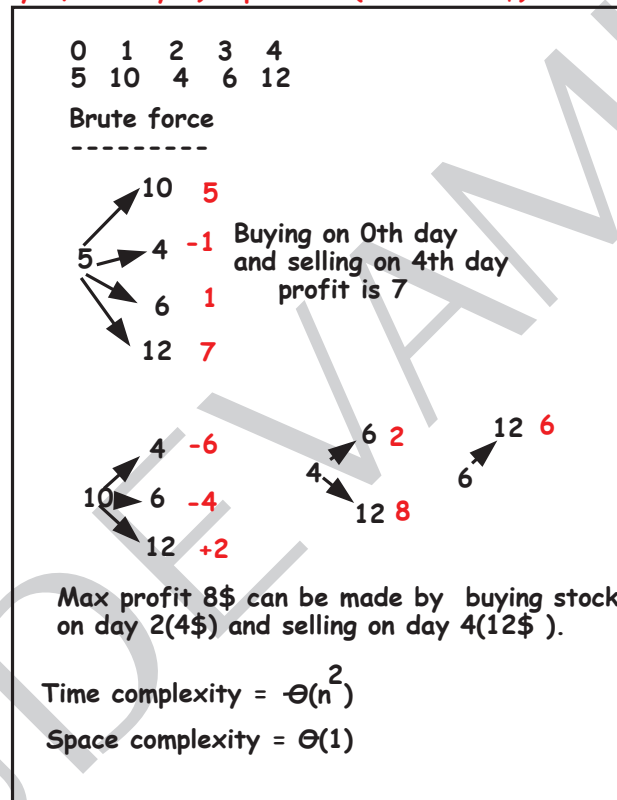


Figure 20.8: Problem description

### 20.9.1 $\Theta(n^2)$ time and $\Theta(1)$ space algorithm

See figure 20.8

### 20.9.2 $\Theta(n \log_2 n)$ time and $\Theta(\log_2 n)$ space algorithm

## 20.9. BUYING AND SELLING STOCKS

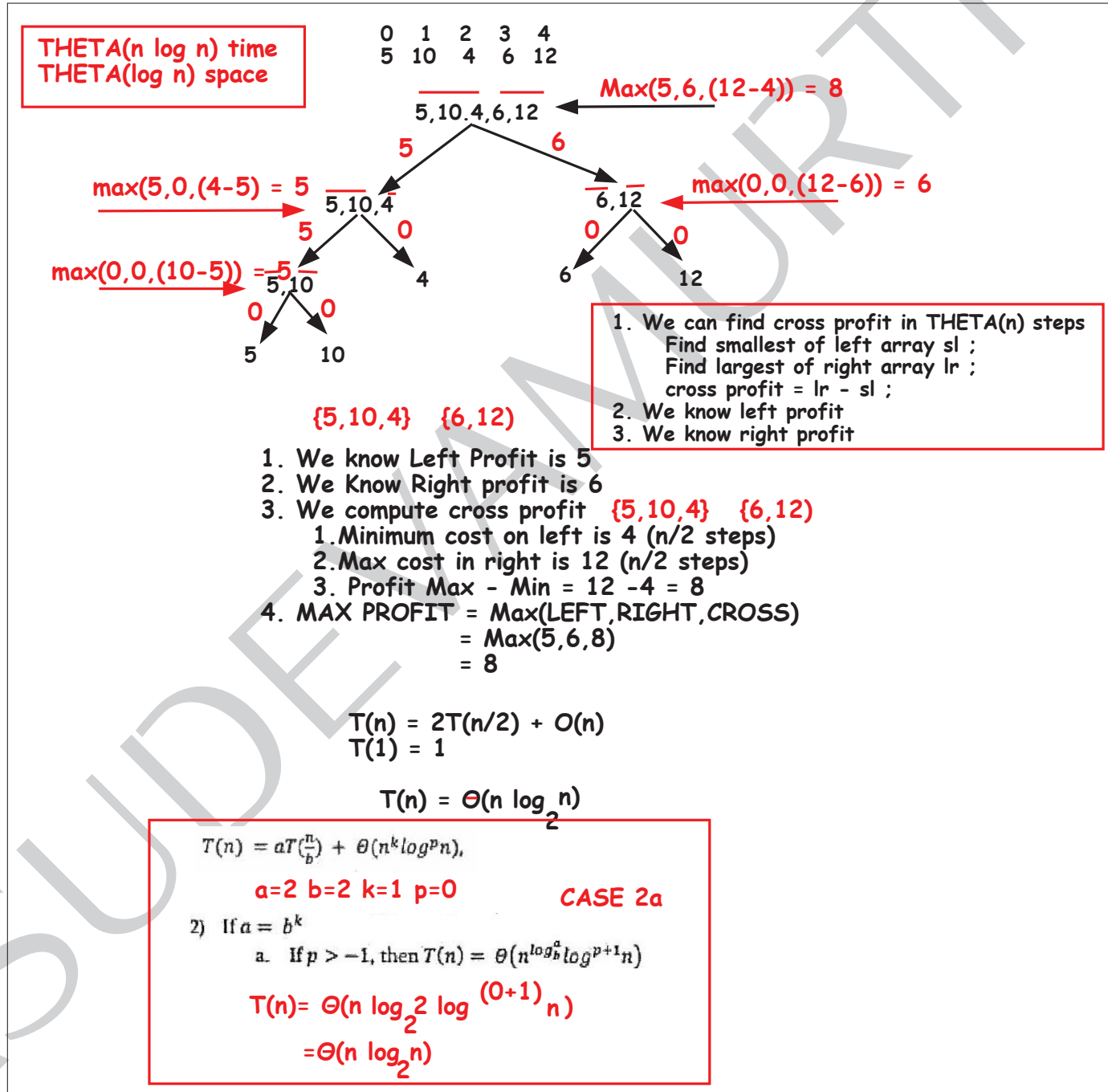


Figure 20.9:  $\Theta(n \log_2 n)$  time and  $\Theta(\log_2 n)$  space algorithm

### 20.9.3 $\Theta(n)$ time and $\Theta(\log_2 n)$ space algorithm

## 20.9. BUYING AND SELLING STOCKS

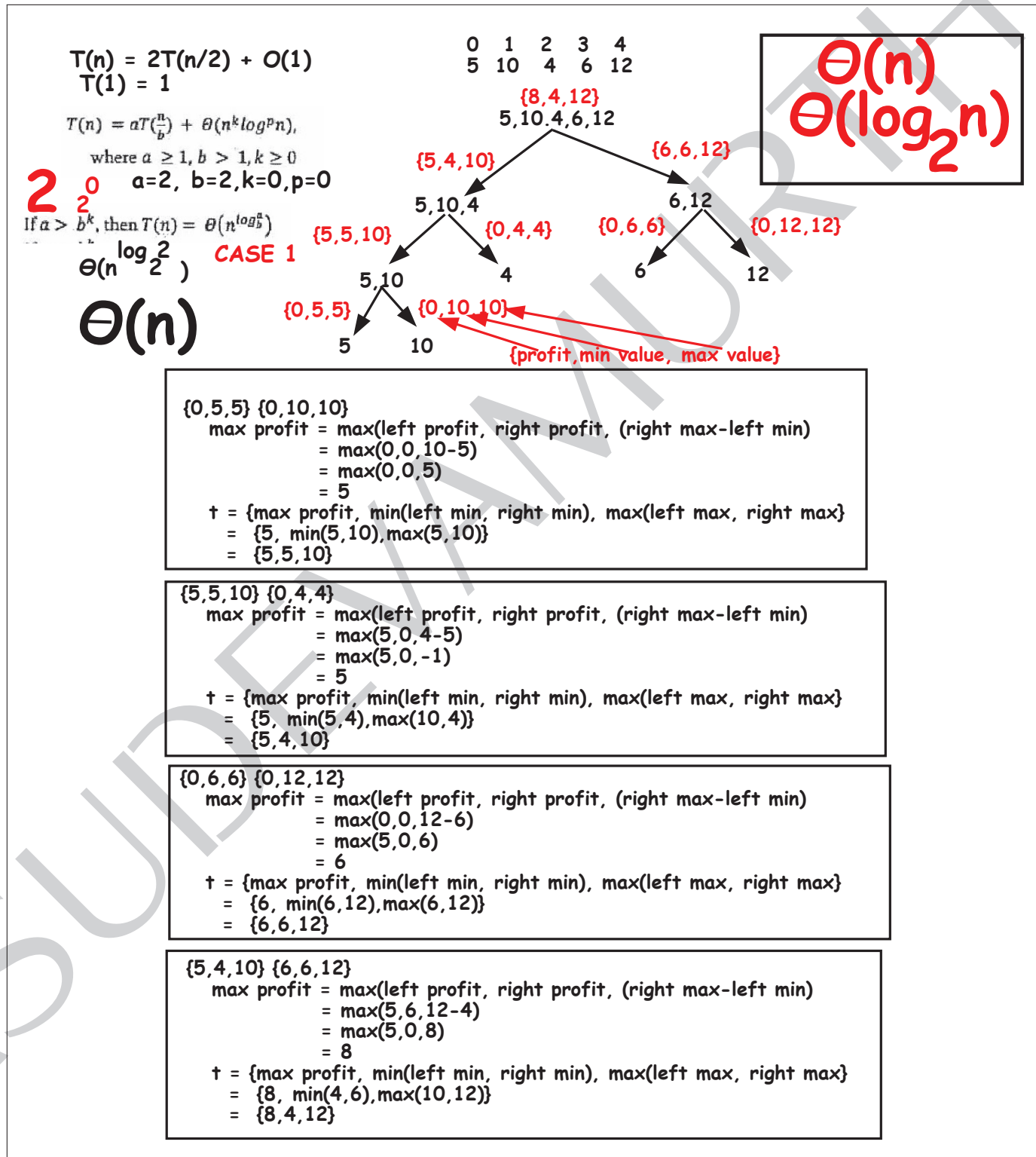


Figure 20.10:  $\theta(n)$  time and  $\theta(\log_2 n)$  space algorithm