20.9 Buying and Selling stocks

We<u>are given an array of n</u>integers representing stock prices on a single day. We want to find a pair (buyDay, sellDay), with buyDay <= 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\$) 5 10 Brute force Buying on Oth day and selling on 4th day profit is 7 Max profit 8\$ can be made by buying stock on day 2(4\$) and selling on day 4(12\$). Time complexity = $\Theta(n^2)$ Space complexity = $\Theta(1)$

Figure 20.8: Problem description

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

See figure 20.8

20.9.2 $\Theta(nlog_2n)$ time and $\Theta(log_2n)$ space algorithm

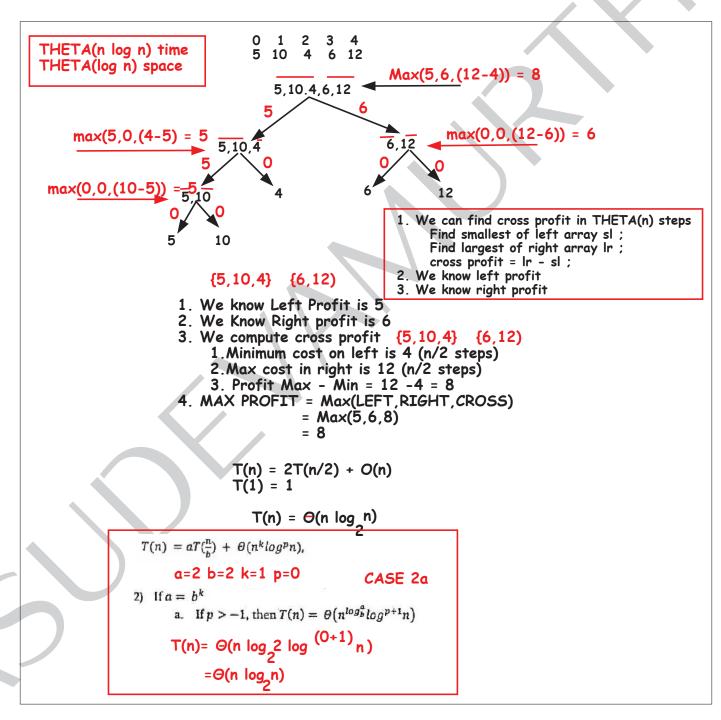


Figure 20.9: $\Theta(nloq_2n)$ time and $\Theta(loq_2n)$ space algorithm

20.9.3 $\Theta(n)$ time and $\Theta(log_2n)$ space algorithm

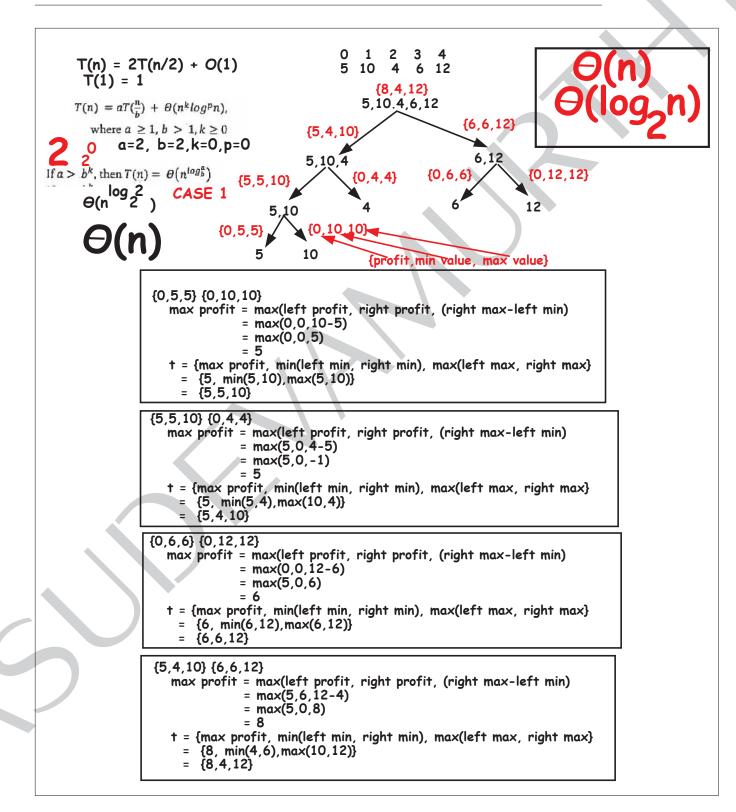


Figure 20.10: $\Theta(n)$ time and $\Theta(\log_2 n)$ space algorithm