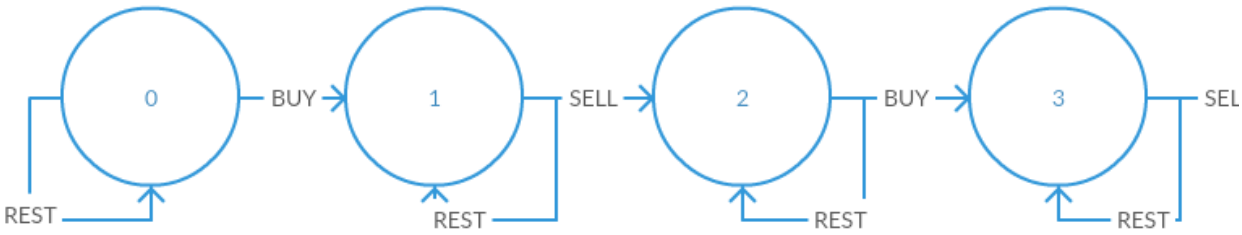
shetty4l ★ 410 Last Edit: October 17, 2018 5:59 PM 17.4K VIEWS

399

O(n) time complexity, O(1) space solution using State Machine and DP

This approach can be used for all the problems based on stock prices.

The idea is to design a state machine that correctly describes the problem statement.



Intuition behind the state diagram:
We begin at state `0`, where we can either rest (i.e. do nothing) or buy stock at a given price.

- If we choose to rest, we remain in state `0`
- If we buy, we spend some money (price of the stock on that day) and go to state `1`

From state `1`, we can once again choose to do nothing or we can sell our stock.

- If we choose to rest, we remain in state `1`
- If we sell, we earn some money (price of the stock on that day) and go to state `2`

This completes one transaction for us. Remember, we can only do *atmost* 2 transactions.

From state `2`, we can choose to do nothing or buy more stock.

- If we choose to rest, we remain in state `2`
- If we buy, we go to state `3`

From state `3`, we can once again choose to do nothing or we can sell our stock for the last time.

- If we choose to rest, we remain in state `3`
- If we sell, we have utilized our allowed transactions and reach the final state `4`

Going from the state diagram to code