

Leetcode_188 Best Time to Buy and Sell Stock IV

 [Leetcode Problem](#)  2021-05-11  283 words  2 minutes

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Use **Dynamic Programming - State Machine** to solve Leetcode_188 Best Time to Buy and Sell Stock IV

Problem Description [Leetcode 188](#)

You are given an integer array prices where prices[i] is the price of a given stock on the ith day, and an integer k.

Find the maximum profit you can achieve. You may complete at most k transactions.

Note: You may not engage in multiple transactions simultaneously (i.e., you must sell the stock before you buy again).

Examples Test Cases [Leetcode 188](#)

▼ Code

```
1 Input: k = 2, prices = [2,4,1]
2 Output: 2
3 Explanation: Buy on day 1 (price = 2) and sell on day 2 (price = 4), profit = 4-2 = 2.
```

▼ Code

```
1 Input: k = 2, prices = [3,2,6,5,0,3]
2 Output: 7
3 Explanation: Buy on day 2 (price = 2) and sell on day 3 (price = 6), profit = 6-2 = 4. Then buy o
```

Problem Solution [Leetcode 188](#)

▼ C++

```
1 class Solution {
2 public:
3     int f[1050][105][5];
4     int maxProfit(int k, vector<int>& prices) {
5         memset(f, -0x3f, sizeof f);
6         int n = prices.size();
7         for(int i = 0; i <= n; i++){
8             f[i][0][0] = 0;
9         }
10
11         for(int i = 1; i <= n; i++){
12             int val = prices[i-1];
13             for(int j = 1; j <= k; j++){
14                 f[i][j][0] = max(f[i-1][j][0], f[i-1][j][1] + val);
15                 f[i][j][1] = max(f[i-1][j][1], f[i-1][j-1][0] - val);
16             }
17         }
18
19         int ret = 0;
20         for(int j = 1; j <= k; j++) ret = max(ret, f[n][j][0]);
21         return ret;
22     }
23 };
```



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Next article
Leetcode_123 Best Time to Buy and Sell Stock III

Next article
Leetcode_486 Predict the Winner

▶

DP-State-Machine sp21

CONTENTS

- | [Problem Description](#) Leetcode 188
- | [Examples Test Cases](#) Leetcode 188
- | [Problem Solution](#) Leetcode 188