MCS – 253P ADVANCED PROGRAMMING AND PROBLEM SOLVING

LAB 9 Code(Minimum Cost For Tickets)

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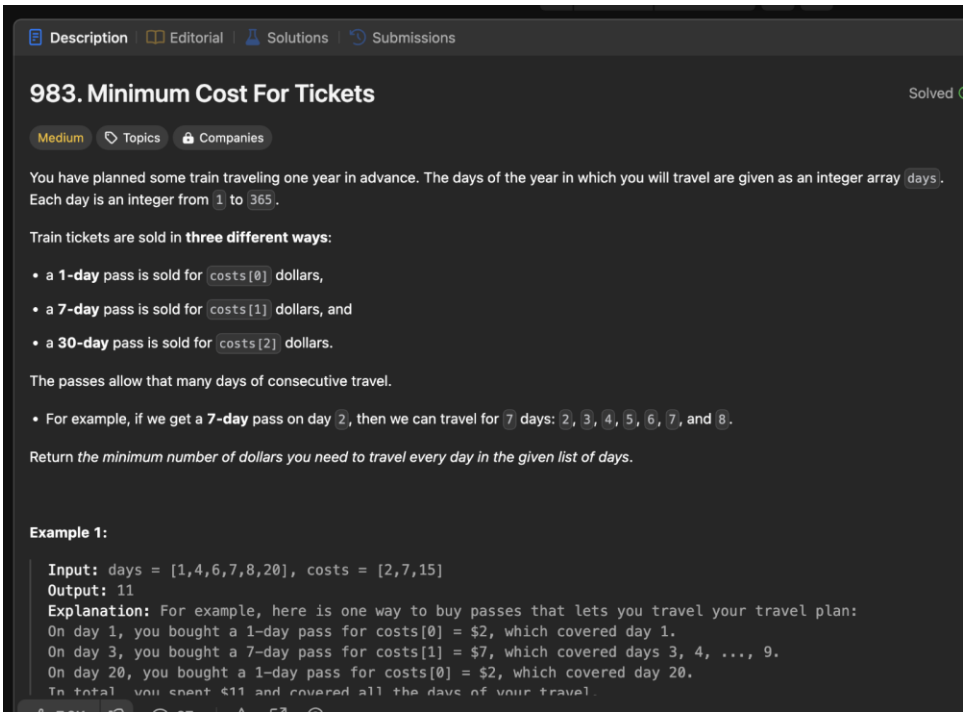
Question



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983. Minimum Cost For Tickets

Solved

Medium | Topics | Companies

You have planned some train traveling one year in advance. The days of the year in which you will travel are given as an integer array `days`. Each day is an integer from `1` to `365`.

Train tickets are sold in **three different ways**:

- a **1-day** pass is sold for `costs[0]` dollars,
- a **7-day** pass is sold for `costs[1]` dollars, and
- a **30-day** pass is sold for `costs[2]` dollars.

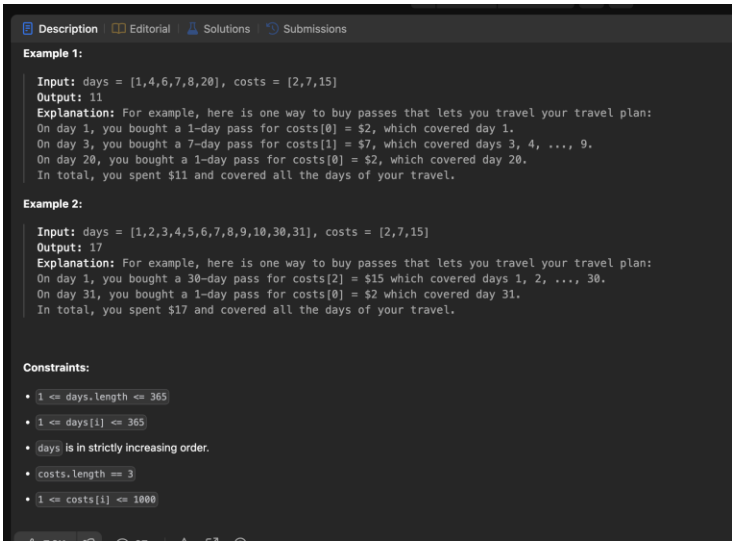
The passes allow that many days of consecutive travel.

- For example, if we get a **7-day** pass on day `2`, then we can travel for `7` days: `2`, `3`, `4`, `5`, `6`, `7`, and `8`.

Return *the minimum number of dollars you need to travel every day in the given list of days.*

Example 1:

```
Input: days = [1,4,6,7,8,20], costs = [2,7,15]
Output: 11
Explanation: For example, here is one way to buy passes that lets you travel your travel plan:
On day 1, you bought a 1-day pass for costs[0] = $2, which covered day 1.
On day 3, you bought a 7-day pass for costs[1] = $7, which covered days 3, 4, ..., 9.
On day 20, you bought a 1-day pass for costs[0] = $2, which covered day 20.
In total, you spent $11 and covered all the days of your travel.
```



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On day 20, you bought a 1-day pass for costs[0] = $2, which covered day 20.
In total, you spent $11 and covered all the days of your travel.
```

Example 2:

```
Input: days = [1,2,3,4,5,6,7,8,9,10,30,31], costs = [2,7,15]
Output: 17
Explanation: For example, here is one way to buy passes that lets you travel your travel plan:
On day 1, you bought a 30-day pass for costs[2] = $15 which covered days 1, 2, ..., 30.
On day 31, you bought a 1-day pass for costs[0] = $2 which covered day 31.
In total, you spent $17 and covered all the days of your travel.
```

Constraints:

- `1 <= days.length <= 365`
- `1 <= days[i] <= 365`
- `days` is in strictly increasing order.
- `costs.length == 3`
- `1 <= costs[i] <= 1000`

Code :

```cpp
#include <vector>
#include <algorithm>

class Solution {
public:
    int mincostTickets(vector<int>& days, vector<int>& costs) {
        vector<int> dp(366, 0);
        int n = days.size();
        int index = 0;

        for (int i = 1; i <= 365; ++i) {
            if (index < n && days[index] == i) {
                dp[i] = min({ dp[i - 1] + costs[0], dp[max(0, i - 7)] + costs[1], dp[max(0, i - 30)] + costs[2] });
                ++index;
            } else {
                dp[i] = dp[i - 1];
            }
        }

        return dp[days[n - 1]];
    }
};
```

Output: