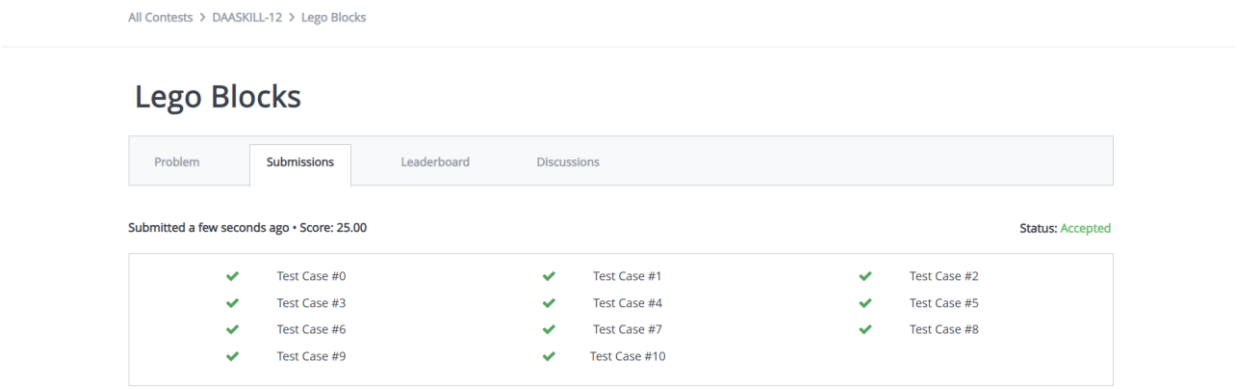
ID NO : 2300031672
NAME : K.Imran

LAB SKILL-WEEK 12

1) Lego Blocks:

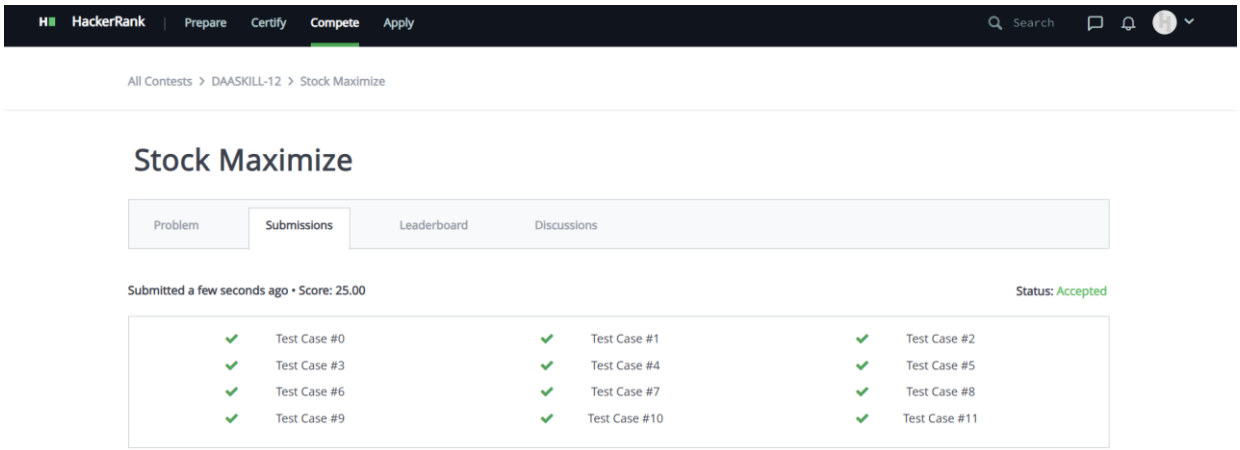


Submitted Code:-

```
#include <stdio.h>
#include <stdlib.h>

#define MOD 1000000007

void calculateRowCombinations(int maxWidth, int *rowCombinations) {
    rowCombinations[0] = 1;

    for (int i = 1; i <= maxWidth; i++) {
        rowCombinations[i] = rowCombinations[i - 1];
        if (i >= 2) rowCombinations[i] = (rowCombinations[i] + rowCombinations[i - 2]) % MOD;
        if (i >= 3) rowCombinations[i] = (rowCombinations[i] + rowCombinations[i - 3]) % MOD;
        if (i >= 4) rowCombinations[i] = (rowCombinations[i] + rowCombinations[i - 4]) % MOD;
    }
}

int legoBlocks(int n, int m) {
    int *rowCombinations = (int *)malloc((m + 1) * sizeof(int));
    int *totalWays = (int *)malloc((m + 1) * sizeof(int));
    int *solidWays = (int *)malloc((m + 1) * sizeof(int));

    calculateRowCombinations(m, rowCombinations);

    for (int i = 1; i <= m; i++) {
        totalWays[i] = 1;
        for (int j = 0; j < n; j++) {
            totalWays[i] = (1LL * totalWays[i] * rowCombinations[i]) % MOD;
```

```
        }
    }

    for (int i = 1; i <= m; i++) {
        solidWays[i] = totalWays[i];
        for (int j = 1; j < i; j++) {
            solidWays[i] = (solidWays[i] - (1LL * solidWays[j] * totalWays[i - j]) % MOD + MOD) %
MOD;
        }
    }

    int result = solidWays[m];
    free(rowCombinations);
    free(totalWays);
    free(solidWays);

    return result;
}

int main() {
    int t;
    scanf("%d", &t);
    while (t--) {
        int n, m;
        scanf("%d %d", &n, &m);
        printf("%d\n", legoBlocks(n, m));
    }
    return 0;
}
```

2) Stock Maximize:



Submitted Code:

```
 #include <stdio.h>
#include <stdlib.h>

long stockmax(int prices_count, int* prices) {
    long profit = 0;
    int max_future_price = 0;

    for (int i = prices_count - 1; i >= 0; i--) {
        if (prices[i] > max_future_price) {
            max_future_price = prices[i];
        }

        profit += max_future_price - prices[i];
    }

    return profit;
}

int main() {
    int t;
    scanf("%d", &t);

    for (int t_itr = 0; t_itr < t; t_itr++) {
        int n;
        scanf("%d", &n);

        int* prices = (int*)malloc(n * sizeof(int));
        for (int i = 0; i < n; i++) {
            scanf("%d", &prices[i]);
        }

        long result = stockmax(n, prices);
        printf("%ld\n", result);

        free(prices);
    }

    return 0;
}
```