

# Landscaping

Farmer John is making the difficult transition from raising mountain goats to raising cows. His farm, while ideal for mountain goats, is far too mountainous for cattle and thus needs to be flattened out a bit. Since flattening is an expensive operation, he wants to remove the smallest amount of earth possible.

The farm is long and narrow and is described in a sort of two-dimensional profile by a single array of  $N$  ( $1 \leq N \leq 1000$ ) integer elevations (range  $1..1,000,000$ ) like this:

```
1 2 3 3 3 2 1 3 2 2 1 2,
```

which represents the farm's elevations in profile, depicted below with asterisks indicating the heights:

```
  * * *   *
 * * * * * * * * * *
 * * * * * * * * * *
1 2 3 3 3 2 1 3 2 2 1 2
```

A contiguous range of one or more equal elevations in this array is a "peak" if both the left and right hand sides of the range are either the boundary of the array or an element that is lower in elevation than the peak. The example above has three peaks.

Determine the minimum volume of earth (each unit elevation reduction counts as one unit of volume) that must be removed so that the resulting landscape has no more than  $K$  ( $1 \leq K \leq 25$ ) peaks. Note well that elevations can be reduced but can never be increased.

If the example above is to be reduced to 1 peak, the optimal solution is to remove  $2 + 1 + 1 + 1 = 5$  units of earth to obtain this set of elevations:

```
  * * *   -
 * * * * * - - - -
 * * * * * * * * * *
1 2 3 3 3 2 1 1 1 1 1 1
```

where '-'s indicate removed earth.

## Input

The first line of the input contains integer  $t$  representing the number of test cases. Then  $t$  test cases follow. Each test case has the following form:

- Line 1: Two space-separated integers:  $N$  and  $K$
- Lines 2.. $N+1$ : Each line contains a single integer elevation. Line  $i+1$  contains the elevation for index  $i$ .

## Output

For each test case, output the minimum volume of earth that must be removed to reduce the number of peaks to  $K$ .

## Example

### Input:

1  
12 1  
1  
2  
3  
3  
3  
2  
1  
3  
2  
2  
1  
2

### Output:

5

### Input details

This is the example used above.