Minimize the heights

Submissions: 36492 (/problem_submissions.php?pid=1050) Accuracy: 26.86% Difficulty: Medium (https://practice.geeksforgeeks.org/Medium/0/0/) Marks: 4

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Problems

Given an array A[] denoting heights of N towers and a positive integer K, modify the heights of each tower either by increasing or decreasing them by K only once and then find out the minimum difference of the heights of shortest and longest towers.

Example

```
Input  : A[] = {1, 15, 10}, k = 6
Output : 5
Explanation : We change 1 to 7, 15 to
9 and 10 to 4. Maximum difference is 5
(between 4 and 9). We can't get a lower
difference.
```

Input

The first line of input contains an integer T denoting the number of test cases. Then T test cases follow. The first line of each test case contains a positive integer K. The second line of each test case contains a positive integer N, denoting number of towers. The third line of the test cases contains N integers denoting the heights of N towers.

Output

For each test case in new line print out the minimum difference of

heights possible.

Constraints

1 <= T <= 100
0 < K <= 30
0 < N <= 30
0 <= A[i] <= 500

Examples

Input

3
2
4
1 5 8 10
3
5
3 9 12 16 20
4
6
100 150 200 250 300 400

Output

5
11
292

Explanation:

Test Case 1: arr[] = {1, 5, 8, 10}. k = 2
The array can be modified as: {3, 3, 6, 8}. The difference between the largest and the smallest is 8-3 = 5. We can't have a difference less than this.

Test Case 2: arr[] = {3 9 12 16 20}. k = 3
The array can be modified as: {6 12 9 13 17}. The difference between the largest and the smallest is 17-6 = 11.

** For More Input/Output Examples Use 'Expected Output' option **