E. Lanes of Cars

time limit per test: 2 seconds
memory limit per test: 256 megabytes

Harshith is the president of TollClub. He tasks his subordinate Aryan to oversee a toll plaza with n lanes. Initially, the i-th lane has a_i cars waiting in a queue. Exactly one car from the front of each lane passes through the toll every second.

The angriness of a car is defined as the number of seconds it had to wait before passing through the toll. Consider it takes 1 sec for each car to pass the toll, i.e., the first car in a lane has angriness 1, the second car has angriness 2, and so on.

To reduce congestion and frustration, cars are allowed to switch lanes. A car can instantly move to the back of any other lane at any time. However, changing lanes increases its angriness by an additional k units due to the confusion caused by the lane change.

Harshith, being the awesome person he is, wants to help the drivers by minimising the total angriness of all cars. He asks Aryan to do so or get fired. Aryan is allowed to change lanes of any car anytime (possibly zero), but his goal is to find the minimum possible total angriness if the lane changes are done optimally. Help Aryan retain his job by determining the minimum angriness he can achieve.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10^4$). The description of the test cases follows.

The first line of each test case contains two integers n and k ($1 \le n \le 2 \cdot 10^5$, $1 \le k \le 10^6$) — the number of lanes and the increment in angriness on a lane change.

The second line of each test case contains n space-separated integers, denoting array a — the i -th number representing the number of cars in the i-th lane ($1 \le a_i \le 10^6$).

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

Note that the sum of $\max a_i$ over all test cases is **not** bounded.

Output

For each test case, output a single integer in a new line, denoting the minimum total angriness.

Example

input

```
6
3 4
13 7 4
4 9
6 12 14 5
5 3
2 4 13 5 10
1 7
6
13 4
10 26 34 39 9 43 48 41 1 38 13 4 46
16 3
```

Codeforces Round 1033 (Div. 2) and CodeNite 2025
Contest is running
01:28:11
Contestant

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms
Choose file: Choose File No file chosen
Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.
Submit

→ Last submissions

Submission	Time	Verdict
325433823	Jun/21/2025 18:04	Pretests passed

→ Score table

	Score
Problem A	438
Problem B	657
Problem C	1095
Problem D	1533
Problem E	2190
Problem F	2628
Problem G	3504
Successful hack	100
Unsuccessful hack	-50
Unsuccessful submission	-50
Resubmission	-50

* If you solve problem on 00:31 from the first attempt

```
176342 171863 70145 80835 160257 136105 78541 100795 114461 45482 68210 51656 29593
8750 173743 156063
```

output Copy

```
123
219
156
21
5315
82302351405
```

Note

In the first test case, Aryan shifts two cars from lane 1 to lane 3, after which the array becomes $[11, 7, 6]$. The total angriness is $\frac{11 \cdot 12}{2} + \frac{7 \cdot 8}{2} + \frac{6 \cdot 7}{2} + 2 \cdot 4 = 123$. It can be proven that this is the minimum possible angriness.

In the fourth test case, there is only one lane, so cars can't shift lanes. Total angriness is $\frac{6 \cdot 7}{2} = 21$.