Division

https://vjudge.net/problem/hdu-3480

Little D is really interested in the theorem of sets recently. There's a problem that confused him a long time.
Let T be a set of integers. Let the MIN be the minimum integer in T and MAX be the maximum, then the cost of set T if defined as (MAX -C MIN)^2. Now given an integer set S, we want to find out M subsets S1, S2, ..., SM of S, such that

$$S_1 \cup S_2 \cup \cdots \cup S_M = S$$

and the total cost of each subset is minimal.

Input

The input contains multiple test cases.
In the first line of the input there's an integer T which is the number of test cases. Then the description of T test cases will be given.
For any test case, the first line contains two integers N (≤ 10,000) and M (≤ 5,000). N is the number of elements in S (may be duplicated). M is the number of subsets that we want to get. In the next line, there will be N integers giving set S.

Output

For each test case, output one line containing exactly one integer, the minimal total cost. Take a look at the sample output for format.

Sample

Input	Output
2 3 2 1 2 4 4 2 4 7 10 1	Case 1: 1 Case 2: 18

Hint

The answer will fit into a 32-bit signed integer.