Problem A. Adjacent Product Sum

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You have n numbers $a_1, a_2, \ldots, a_n$. You want to arrange them in a circle so as to maximize the sum of products of pairs of adjacent numbers.

Formally, you want to find a permutation $b_1, b_2, \ldots, b_n$ of $a_1, a_2, \ldots, a_n$ such that $b_1b_2 + b_2b_3 + \ldots + b_{n-1}b_n + b_nb_1$ is maximal.

Find this maximum value.

Input

The first line contains a single integer t $(1 \le t \le 10^4)$ — the number of test cases. The description of test cases follows.

The first line of each test case contains a single integer n $(3 \le n \le 2 \cdot 10^5)$ — the number of numbers.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ $(-10^6 \le a_i \le 10^6)$.

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

Output

For each test case, print a single integer — the maximum possible value of the expression $b_1b_2 + b_2b_3 + \ldots + b_{n-1}b_n + b_nb_1$ over all permutations $b_1, b_2, \ldots, b_n$ of $a_1, a_2, \ldots, a_n$.

Example

standard input	standard output
4 3 1 2 3 6 1 1 1 1 0 0 5 100000 100000 100000 100000 -100000 5 1 2 3 4 5	11 3 10000000000 48

Note

In the first test case, there is only one way to arrange the numbers in a circle (not counting rotations and symmetries) — $(1, 2, 3)$. The sum of products of pairs of adjacent numbers is $1 \cdot 2 + 2 \cdot 3 + 3 \cdot 1 = 11$.

In the second test case, one of the optimal arrangements is $(1, 1, 1, 1, 0, 0)$. For it this sum is equal to $1 \cdot 1 + 1 \cdot 1 + 1 \cdot 1 + 1 \cdot 0 + 0 \cdot 0 + 0 \cdot 1 = 3$.

In the third test case, there is a unique (up to rotations and symmetries) way to arrange the numbers in a circle: $(100000, 100000, 100000, 100000, -100000)$, the answer is $100000^2 = 10^{10}$. Note that the answer may not fit into int32.

In the fourth test case, one of the optimal permutations is $(1, 2, 4, 5, 3)$, the answer for which is $1 \cdot 2 + 2 \cdot 4 + 4 \cdot 5 + 5 \cdot 3 + 3 \cdot 1 = 2 + 8 + 20 + 15 + 3 = 48$.