

Problem I. Travel Brochure

Time limit: 1s

Color of balloons: cyan

Welcome to Galilei Town, a high and new technology industrial development zone surrounding the Dishui lake. N villages numbered from 0 to $N - 1$ are located along the lake and a loop-line bus is the only transportation in this town. The bus is a one-way line passing the villages $0, 1, 2, \dots, N - 1$ successively, going back to the 0-th village and continuing the above route.

We may measure the landscape of the i -th villages by an integer w_i and $\sum_{i=0}^{N-1} w_i = 0$. Once a traveller takes the bus from the u -th village to the v -th village, he would evaluate the experience by two coefficients $a = w_v$.

Now, as the tour guide, you need to design a travel brochure for guests who came from far away. Your task is to choose a village i_0 as the starting village of the travel and at least two more villages i_1, i_2, \dots, i_k . Guests would start their travel from the i_0 -th village and visit the planned k villages in sequence by loop-line bus. Finally they will go back to the i_0 -th village from the i_k -th one and finish their travel. If we let $i_{k+1} = i_0$, the whole travel would be evaluated by the score $\frac{1}{2} \sum_{j=0}^k (a_{i_{j+1}} - a_{i_j}) \frac{b_{i_j} b_{i_{j+1}}}{a_{i_j} a_{i_{j+1}}}$. You need to know the maximum possible score.

Input

The first line of input contains an integer t which is the number of test cases. Then t test cases follow. For each test case, the first line consists of an integer N ($3 \leq N \leq 100000$). The second line consists of N non-zero integers w_0 to w_{N-1} where each w_i satisfies $|w_i| \leq 100$. We guarantee that the sum of w_i would be zero.

Output

For each case, output the maximum score of the whole evaluation rounded to 5 decimal places behind the decimal point in a line.

Sample

standard input	standard output
1 10 1 4 1 2 -3 -5 2 -2 2 -2	28.66667

The best route starts from the 5-th village. Go passing the 6-th, 7-th, 8-th, 9-th, 0-th, 1-st, 2-nd, 3-rd villages and arrive at the 4-th village. Then go around the lake to the 3-rd village. Again go to the 2-nd village and back to the 5-th village.