

제 7 회 대학생 프로그래밍 경시대회



문제 D Maximum Detour

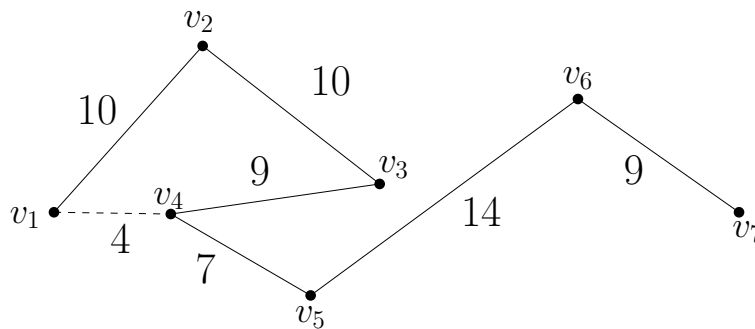
Consider a geometric graph $G = (V, E)$ which is just a path of N vertices. More precisely, $V = \{v_1, v_2, \dots, v_N\}$ and $E = \{v_i v_{i+1} \mid 1 \leq i \leq N-1\}$. Also, in a geometric graph each vertex in V is represented by a point on the plane and each edge in E by a straight line segment connecting two points corresponding to two vertices.

If we regard G as a road network on our plane so that we are allowed to move only on the network, then it will make some detours when moving on G compared to the direct path between two points. To measure such quantity, define the *detour* $D(G, v_i, v_j)$ between two vertices v_i, v_j in V with $i < j$ as follows:

$$D(G, v_i, v_j) = d_G(v_i, v_j) / d(v_i, v_j),$$

where $d_G(v_i, v_j) = d(v_i, v_{i+1}) + d(v_{i+1}, v_{i+2}) + \dots + d(v_{j-1}, v_j)$ and $d(\cdot, \cdot)$ denotes the Euclidean distance function. Further, we denote by $D(G)$ the *maximum detour* of geometric graph G among all the pairs of vertices of G :

$$D(G) = \max \{D(G, v, w) \mid v, w \in V, v \neq w\}.$$



In figure above, a geometric graph G is seen as a path of 7 vertices $\{v_1, \dots, v_7\}$. Numbers indicate the Euclidean distances between pairs of vertices; for instance, $d(v_1, v_2) = 10$ and $d(v_1, v_4) = 4$. Here, you can see that $D(G, v_1, v_4) = d_G(v_1, v_4) / d(v_1, v_4) = (10 + 10 + 9) / 4 = 29/4$.

In this problem, you will be given a sequence of N points and two consecutive points are supposed to be connected by an edge which is represented by a straight line segment. Then, you are to compute the maximum detour $D(G)$ of a given geometric graph G .

입력

Your program is to read from standard input. The input consists of T ($1 \leq T \leq 20$) test cases. The number T of test cases is given in the first line of the input. Each test case contains the number N ($2 \leq N \leq 10000$) of vertices of a given geometric graph G (which is a path) at first line, and the coordinates of the vertices following line by line. The coordinates of each vertex are bounded in the range $[-10000 \dots 10000]$. All the primitive input values are given as integers and integers in a line are separated by a single space.

출력

Your program is to write to standard output. Print exactly one line for each test case with the maximum detour $D(G)$ of G . The output should contain only two decimal places just by rounding off. Note that G may be possibly self-intersected by its edges, and if $D(G)$ value is at least 1000, you MUST print out “TOO LARGE”, instead of the value of $D(G)$.

Sample Input

Output for the Sample Input

3	3
4	29.82
0 0	TOO LARGE
0 1	
1 1	
1 0	
10	
-91 76	
-87 -41	
44 -12	
-56 49	
-86 50	
92 -14	
-6 -100	
-2 83	
-2 20	
-60 -26	
3	
0 0	
3000 0	
0 1	