Eve The Hacker

Description

You are Eve, the best hacker in the Shik Kingdom. You've hacked into almost every system including NSA (No Such Agency) in the past few years and hacking is becoming boring to you. As a result, you decided to do some study instead of just hacking. You want to know how fast one will send message through the internet hence you eavesdrop several channels, recording the timestamp and the sequence number of some packages. You don't know whether two records come from the same channel since you forget to log it, so you just assign every record a channel number randomly. For an assignment A, you can calculate the transmission speed of a channel of a period of time if there are two records belong to that channel, and you may calculate $F(A)$, the maximum value among all the transmission speed you may calculate (If each record has different channel number, you just take 0 as the value of $F(A)$). Now, you wonder how big is the maximum $F(A)$ among all possible assignment.

For two records (T_1, S_1), (T_2, S_2) that belong to the same channel, the transmission speed is $\frac{S_1 - S_2}{T_1 - T_2}$.

Input

The file contains several test cases. Each test case begins with an integer n, the number of records. The next line contains $2 \times n$ integers $T_1, S_1, T_2, S_2, ..., T_n, S_n$ representing the n records. We guarantee that there are no two records that have the same timestamp and those records are sorted according to their timestamp.

- $2 \leq n \leq 5 \times 10^5$
- $0 \leq T_i, S_i \leq 10^9$

Output

Output the maximum $F(A)$ of each test case.

Sample Input

```
2
1 1 2 0
3
0 0 2 1 3 3
```

Sample Output

```
0.000000000
2.000000000
```