

4818 Largest Empty Circle on a Segment

We are given N line segments on the 2D plane. We want to find the maximum radius of an empty circle whose center coordinates (x_c, y_c) are constrained as follows:

- $0 \leq x_c \leq L$
- $y_c = 0$

A circle is empty if no part of a segment is located strictly inside of it (thus, a segment may touch the circle, but may not intersect with the interior of the circle).

Input

The first line of the input file contains the number of test cases T . The test cases are described next. The first line of a test case contains the integer numbers N and L ($1 \leq N \leq 2000$ and $0 \leq L \leq 10000$). The next N lines of the test case contain 4 integers each, describing the coordinates of the endpoints of a segment: x_a, y_a, x_b and y_b . The coordinates of the endpoints of the segment are (x_a, y_a) and (x_b, y_b) . All the coordinates are between -20000 and $+20000$. Every two consecutive numbers on the same line are separated by a single blank.

Output

For each test case print a line containing a real number R , denoting the maximum radius of an empty circle whose center obeys the constraints. The number must be printed with 3 decimal digits (the number must be rounded up or down according to the usual rounding rules).

Note: The picture on the right corresponds to the sample input below.

Sample Input

```
1
4 10
1 1 10 3
5 3 9 1
3 1 4 1
8 3 11 -3
```

Sample Output

```
2.118
```

