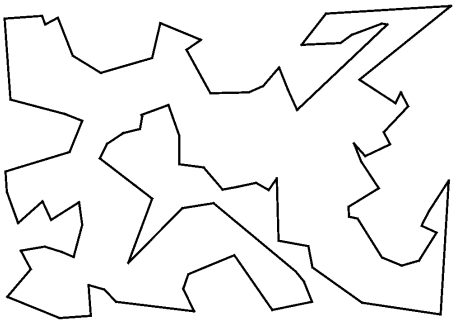
Problem F

Traveling Salesman



Long before the days of international trade treaties, a salesman would need to pay taxes at every border crossed. So your task is to find the minimum number of borders that need to be crossed when traveling between two countries. We model the surface of Earth as a set of polygons in three dimensions forming a closed convex 3D shape, where each polygon corresponds to one country. You are not allowed to cross at points where more than two countries meet.

Input specifications

Each test case consists of a line containing c, the number of countries ($4 \leq c \leq 6000$), followed by c lines containing the integers $n\ x_1\ y_1\ z_1\ \ldots\ x_n\ y_n\ z_n$, describing (in order) the n corners of a closed polygon ($3 \leq n \leq 20$). Then follows a line with one integer m ($0 < m \leq 50$), and then m lines with queries $c_a\ c_b$, where c_a and c_b are country numbers (starting with 1). No point will be on the line between two connected points, and $-10^6 \leq x, y, z \leq 10^6$ for all points. No two non-adjacent edges of a country share a common point. The input is terminated by a case where $c = 0$, which should not be processed.

Output specifications

For each query, output the number of borders you must cross to go from c_a to c_b.

Sample input

```
6
4 0 0 0 0 0 1 0 1 1 0 1 0
4 1 0 0 1 0 1 1 1 1 1 1 0
4 0 0 0 1 0 0 1 0 1 0 0 1
4 0 1 0 1 1 0 1 1 1 0 1 1
4 0 0 0 0 1 0 1 1 0 1 0 0
4 0 0 1 0 1 1 1 1 1 1 0 1
2
1 2
1 3
0
```

Output for sample input

```
2
1
```