Problem H.
Hidden Glyphs
Time limit: 8 seconds

Glyph Yuji loves traveling and discovering various glyphs in different countries. After several years of travelling, Glyph find that there are similarities between glyphs he found in two countries: Lollipop and Boomerang. The handwritting system from these two places are so similar – all glyphs used for handwritting are in rectangular shapes.

A rectangular shaped glyph can be modeled as a simple polygon in 2D Euclidean plane where every edge of the polygon is either parallel or perpendicular to the axes.

With deeper inspection between two languages used in Lollipop and Boomerang, Glyph has made some observations: (1) glyphs from Lollipop are usually larger than glyphs from Boomerang. (2) There are exactly n different glyphs from each language, and there is a one-to-one correspondence between them.

However, Glyph does not know which glyph in Lollipop language corresponds to which glyph in Boomerang language. To explore this correspon-

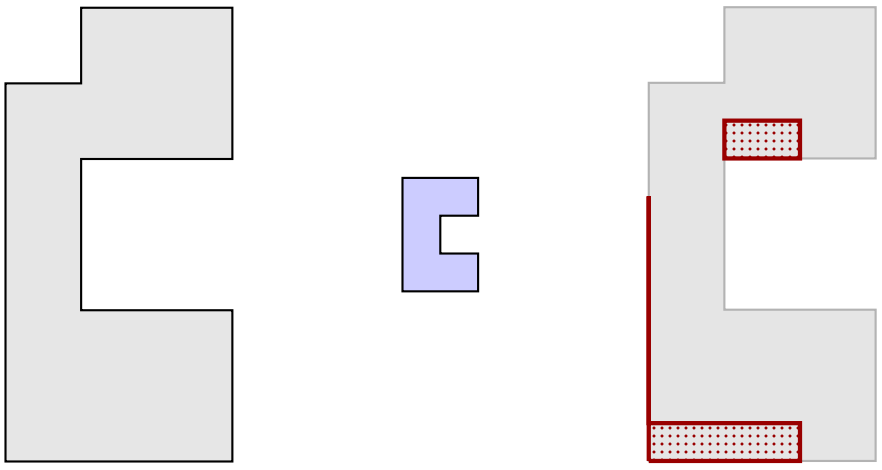


Figure 1: The glyph from Lollipop country (left), the corresponding glyph from Boomerang country (middle) and the possible translation area (right). (With the left-bottom corner as $(0, 0)$)

dence, Glyph first describe each glyph as a simple polygon.

Formally, for a region B and a point (x, y), Glyph define $B + (x, y)$ be the set $B + (x, y) := \{(b_x + x, b_y + y) \mid (b_x, b_y) \in B\}$. For every pair of glyph L in Lollipop and glyph B in Boomerang, Glyph define a "translation area" $tr(L, B)$ to be the area of the region $tr(L, B) := \{(x, y) \mid B + (x, y) \subseteq L\}$. See Figure 1 for example.

Glyph Yuji believes that the true correspondence between the two languages must give the largest total sum of translation area among all matched glyph pairs. Notice that, under this definition it is possible for a pair of glyphs having translation area 0. Can you help Glyph to find this value?

Input

The first line contains an integer T indicating the number of test cases.

Each test case begins with an integer n. Then $2n$ lines follows. The first n lines describe n rectangular shapes representing glyphs from Lollipop language, whereas the following n lines describe n rectangular shapes representing glyphs from Boomerang language.

For the i-th line that describes a rectangular shape, there is an integer m_i denoting the number of vertices followed by m_i pair of integer coordinates listed in either clockwise or counter-clockwise order.

- $1 \leq T \leq 4$
- $1 \leq n \leq 30$
- $4 \leq m_i \leq 200$
- For all coordinates (x, y), $0 \leq x, y \leq 1000$.
- All rectangular shapes are valid, non-degenerate simple polygons.

Output

For each testcase, please output one line containing only one integer indicating the largest total sum of all translation area among matched pairs. It can be shown that the solution must be an integer.

Sample Input	Sample Output
2 1 10 0 0 0 10 2 10 2 12 6 12 6 8 2 8 2 4 6 4 6 0 8 0 0 0 3 2 3 2 2 1 2 1 1 2 1 2 0 2 5 0 0 0 2 0 5 5 5 5 0 4 0 0 3 0 3 6 0 6 4 0 0 1 0 1 2 0 2 4 0 0 0 1 2 1 2 0	6 20