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Engineering company "STOBET" ltd makes projects for buildings and structures. Having many such projects, we want to improve the quality and the price of the process of their realization. In our work we use software for design of steel constructions. The software gives the drawings of the different needed profiles. After making all the drawings, the task is to deploy optimally all profiles on a steel sheet.

Task for optimization:

We have a large piece of steel sheet with dimensions $X=1500$ mm, $Y=12000$ mm. In this big sheet we have to locate maximum number of small plates of given profiles.

The contour of the plates can be square, rectangle, trapeze, any non crossing closed polyline, consisting of line segments only. The dimensions of the plates are given by the coordinates of the vertices of the polylines as follows:

Plate 1 : (X1, Y1; X2, Y2; X3, Y3)

Plate 2 : (X1, Y1; X2, Y2; X3, Y3; X4, Y4; X5, Y5)

.....

Plate N : (X1, Y1; X2, Y2; X3, Y3; X4, Y4)

The numbers K_1, K_2, \dots, K_N of the pieces of plates with given profile, which must be situated on the steel sheet, are given.

In the process of optimization some plates can be rotated for best fit.

The aim is to locate maximum small plates in the given big steel sheet. A distance for cutting must be left between the plates. This distance is about 5 mm.

