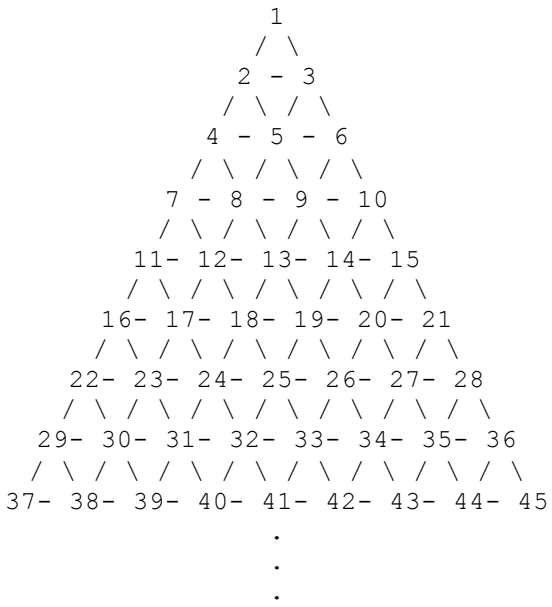
Problem 8
Triangular Vertices



If we number the points from left to right and top to bottom, as shown in the above figure, then groups of these points form the vertices of certain geometric shapes. For example, the sets of points {1, 2, 3} and {7, 9, 18} are the vertices of triangles, the sets {11, 13, 26, 24} and {2, 7, 9, 18} are the vertices of parallelograms, and the sets {4, 5, 9, 13, 12, 7} and {8, 10, 17, 21, 32, 34} are the vertices of hexagons.

Write a program which takes as arguments a set of points on this triangular grid, analyzes it, and determines whether the points are the vertices of one of the following "acceptable" figures: triangle, parallelogram, or hexagon. In order for a figure to be acceptable, it must meet the following two conditions:

1. Each side of the figure must coincide with an edge in the grid.
2. All sides of the figure must be of the same length.

Input

The input will consist of at least 1 and at most six integer points which will be passed as arguments to your program.

Output

Output should consist of one of "triangle", "parallelogram", "hexagon" or "none" depending on the given points and the appropriate classification.

Sample input

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29 31 16
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Sample output

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triangle
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