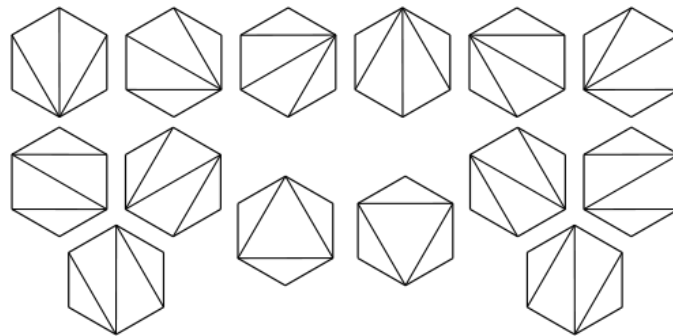


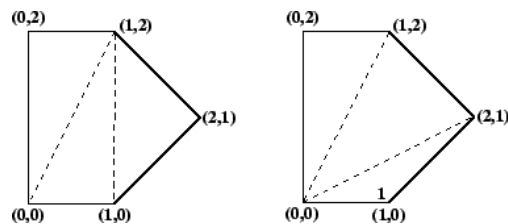
Name \_\_\_\_\_ Student ID \_\_\_\_\_ Computer No. \_\_\_\_\_

### Dynamic Programming

A triangulation of a convex polygon is formed by drawing diagonals between non-adjacent vertices (corners) such that the diagonals never intersect. The problem is to find the cost of triangulation with the minimum cost. The cost of a triangulation is the sum of the weights of its component triangles. Weight of each triangle is its perimeter (sum of lengths of all sides)



Consider



Two triangulations of the same convex pentagon. The triangulation on the left has a cost of  $8 + 2\sqrt{2} + 2\sqrt{5}$  (approximately 15.30), and the one on the right has a cost of  $4 + 2\sqrt{2} + 4\sqrt{5}$  (approximately 15.77).

### Example of the program

Input

{0, 0}, {1, 0}, {2, 1}, {1, 2}, {0, 2}

Output

15.3006

Student will

1. Identify the recurrence relation of this problem
2. Use the dynamic programming approach to solve the given test cases.

Student may

1. Visualize the result of this problem
2. Generate all cases by brute force