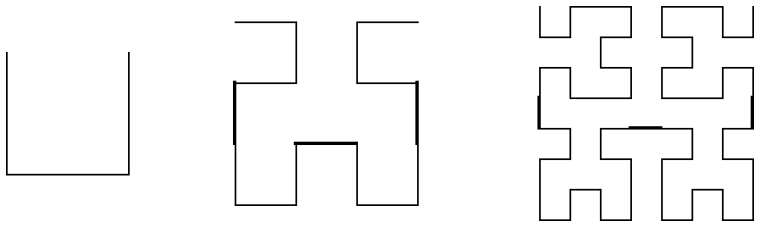
Hilbert Curve

Problem Description

This figure shows Hilbert curves of order one, two, and three:



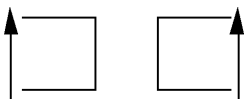
Order 1 Order 2 Order 3

The order one curve consists of three lines on three sides of a square. The order two curve is made from four order one curves in different rotations connected by three unit lines (shown thicker). The order three curve is built from four order two curves connected in the same way.

In general, the order n curve is made this way from four order $n-1$ curves linked by three lines.

Task

Write a program that accepts as input the order, n, and draws an order n Hilbert curve, suitably scaled, on the screen meaning the diagram should basically fill a decent sized window. The program should also take an optional second parameter r which is the ratio of the length of the lines in each succeeding order (by default $r = 1$).



Important Hint

Relates to Objectives

1.1 1.2 1.3 2.1 2.2 2.3 2.4 2.5 2.7 3.3 3.5 4.1 4.5 4.7

(Individual)