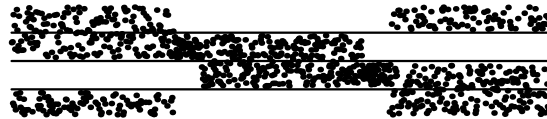


Third homework set

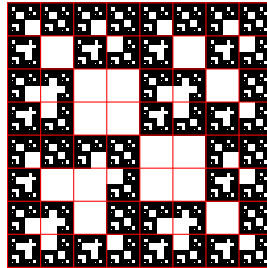
Due at the beginning of class on Thursday, Sept 27. No late homework will be accepted.

Fold your homework paper vertically and PRINT your name on the outside.

1. Pictured here is a time series, with bin boundaries indicated by horizontal lines. Draw a careful sketch of the driven IFS produced by this time series and these bins. Your explanation should include comments about the regimes of the time series.



2. Can this IFS be generated by 1-step memory (forbidden pairs), or must 2-step memory (forbidden triples) be used? Your explanation should include lists of forbidden pairs and forbidden triples, and why these lists support your conclusion.



3. Compute the box-counting dimension of this fractal by finding the number of boxes of side length $1/3$, $1/9$, $1/27$, and in general, $1/3^n$ needed to cover the fractal. For reference, the boxes of side length $1/9$ are shown in the figure.

