Abstract: A little part of the talk I gave, at Matt Foreman’s invitation, at UC Irvine, on Thursday, 23 May 2002.

Meshalkin’s example

Let \( X \) be the, doubly-infinite, shift-space over “digit alphabet” \( \{0, +1, -1, +2, -2\} \). Let \( S : X \rightarrow X \) be the independent \((\frac{1}{2}, \frac{1}{8}, \frac{1}{8}, \frac{1}{8})\)-process on \( X \).

And let \( T : Y \rightarrow Y \) be the independent \((\frac{1}{4}, \frac{1}{4}, \frac{1}{4}, \frac{1}{4})\)-process over “letter alphabet” \( \{E, D, P, N\} \); Even, odd, Positive, Negative.

Each of +1, -1, +2, -2 is a NZD; a Non-Zero Digit.

Given a point \( x \)...

\[ \ldots 0 \ 0 \ 0 \ -1 \ 0 \ 0 \ +1 \ +2 \ +1 \ 0 \ldots \]

\[ \ldots ( ( ( ) ( ( ) ) ) ) ( \ldots \]

regard each 0 as a left-parenthesis, and regard each NZD as a right-parenthesis; this is shown above, in the lower line. I.e, for each pair of the form 0 NZD, [i.e \( x_n = 0 \) and \( x_{n+1} \) is an NZD] link up the pair, then mentally “delete” these pairs. Apply this idea recursively.

\[
0 \ 0 \ 0 \ -1 \ 0 \ 0 \ +1 \ +2 \ +1 \ 0 \\
\begin{array}{cccccccc}
P & N & N & D & P & P & D & E & D & D \\
\end{array}
\]

Below each 0, write “P” or “N” as the 0 is linked to a positive or negative digit. And below the other digits, write “E” or “D” as the digit is even or odd. So the upper string is mapped to the lower strip.

Cylinder sets. A (basic) cylinder set is specified by listing symbols at an interval of coordinates. E.g

\[ C := [+2 \ +2 \ -1 \ 0 \ 0 \ +1] \]

is the set of \( x \in X \) st.

\[ x_7 = +2, \ x_8 = +2, \ x_9 = -1, \ x_{10} = 0, \ x_{11} = 0, \ x_{12} = +1 \]

We define the probability, \( \Pr(C) \), to be the product of the probabilities of the individual symbols. Here,

\[
\Pr(C) = \frac{1}{8} \cdot \frac{1}{8} \cdot \frac{1}{8} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{8}.
\]