This is a start of an implementation of Jäger’s state model for the Conway polynomial, following Chmutov’s talk in Oberwolfach

```
SetDirectory["C:\drobn\projects\KnotTheory\svn\trunk/"]
C:\drobn\projects\KnotTheory\svn\trunk

<< KnotTheory

Read more at http://katlas.org/wiki/KnotTheory.

pd = PD[Knot[5, 2]]

PD[X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[9, 6, 10, 7], X[7, 2, 8, 3]]

List @@ Expand[Times @@ (pd /. x_X :> 1 + x)]

{1, X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[9, 6, 10, 7], X[7, 2, 8, 3]},
X[5, 10, 6, 1], X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[9, 6, 10, 7], X[7, 2, 8, 3],
X[1, 4, 2, 5], X[3, 8, 4, 9], X[7, 2, 8, 3], X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[7, 2, 8, 3],
X[3, 8, 4, 9], X[7, 2, 8, 3], X[1, 4, 2, 5], X[3, 8, 4, 9], X[7, 2, 8, 3], X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[7, 2, 8, 3],
X[9, 6, 10, 7], X[1, 4, 2, 5], X[9, 6, 10, 7], X[3, 8, 4, 9], X[9, 6, 10, 7], X[5, 10, 6, 1], X[9, 6, 10, 7],
X[1, 4, 2, 5], X[3, 8, 4, 9], X[9, 6, 10, 7], X[3, 8, 4, 9], X[5, 10, 6, 1], X[9, 6, 10, 7],
X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[9, 6, 10, 7], X[7, 2, 8, 3], X[9, 6, 10, 7],
X[1, 4, 2, 5], X[3, 8, 4, 9], X[7, 2, 8, 3], X[1, 4, 2, 5], X[3, 8, 4, 9], X[7, 2, 8, 3], X[9, 6, 10, 7],
X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[7, 2, 8, 3], X[9, 6, 10, 7],
X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[9, 6, 10, 7], X[7, 2, 8, 3], X[9, 6, 10, 7],
X[1, 4, 2, 5], X[3, 8, 4, 9], X[5, 10, 6, 1], X[7, 2, 8, 3], X[9, 6, 10, 7]

s = X[3, 8, 4, 9] X[5, 10, 6, 1] X[9, 6, 10, 7]

X[3, 8, 4, 9] X[5, 10, 6, 1] X[9, 6, 10, 7]

Union @@ s

X[1, 3, 4, 5, 6, 7, 8, 9, 10]

Position[s, First[Union @@ s]][[1, 2]]

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SetAttributes[p, Orderless]

(s /. X[i_, j_, k_, l_] :> If[PositiveQ[X[i, j, k, l]], p[i, l] p[j, k], -p[i, j] p[k, l]]) //.
  p[a_, b_] p[b_, c_] :> p[a, c]