

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

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

```
C:\drorbn\projects\KnotTheory\svn\trunk
```

```
<< KnotTheory`
```

```
Loading KnotTheory` version of January 18, 2008, 18:17:28.7446.
```

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

```
4
```

```
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]
```

```
-p[1, 4] p[3, 8] p[5, 7]
```