

Pensieve header: Tabulating classical braids.

(Alt) In[]:=

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SetDirectory@"C:\\drorbn\\AcademicPensieve\\Projects\\OU";
<< "OU-Programs.m"
```

Loading KnotTheory` version of February 2, 2020, 10:53:45.2097.

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

(Alt) In[]:=

```
 $\beta = \text{VPB}[5, \{-1, 3, 2\}, \{-1, 4, 2\}, \{-1, 5, 2\}, \{-1, 2, 5\}, \{-1, 5, 2\}, \{-1, 4, 3\}, \{-1, 4, 1\},$ 
 $\{-1, 1, 4\}, \{-1, 3, 4\}, \{1, 4, 5\}, \{-1, 2, 4\}, \{-1, 2, 5\}, \{1, 3, 2\}, \{1, 1, 2\},$ 
 $\{1, 2, 1\}, \{1, 2, 3\}, \{1, 5, 4\}, \{1, 4, 5\}, \{1, 5, 4\}, \{1, 2, 4\}, \{1, 3, 4\}, \{-1, 5, 2\},$ 
 $\{-1, 2, 5\}, \{-1, 5, 2\}, \{-1, 2, 5\}, \{-1, 5, 2\}, \{-1, 4, 1\}, \{-1, 3, 1\}, \{-1, 1, 3\},$ 
 $\{-1, 1, 4\}, \{-1, 4, 1\}, \{-1, 3, 1\}, \{1, 4, 3\}, \{1, 3, 4\}, \{-1, 1, 3\}, \{-1, 5, 3\},$ 
 $\{1, 3, 2\}, \{-1, 3, 2\}, \{-1, 3, 5\}, \{-1, 3, 1\}, \{-1, 3, 4\}, \{-1, 4, 3\}, \{-1, 1, 3\},$ 
 $\{-1, 5, 3\}, \{-1, 2, 3\}, \{-1, 3, 2\}, \{1, 5, 3\}, \{1, 1, 3\}, \{-1, 3, 4\}, \{-1, 4, 3\},$ 
 $\{1, 3, 1\}, \{1, 4, 1\}, \{1, 1, 4\}, \{1, 1, 3\}, \{1, 3, 1\}, \{1, 4, 1\}, \{1, 5, 2\}, \{1, 2, 5\},$ 
 $\{1, 5, 2\}, \{1, 2, 5\}, \{1, 5, 2\}, \{-1, 3, 4\}, \{-1, 2, 4\}, \{-1, 5, 4\}, \{-1, 4, 5\},$ 
 $\{-1, 5, 4\}, \{-1, 2, 3\}, \{-1, 2, 1\}, \{-1, 1, 2\}, \{-1, 3, 2\}, \{1, 2, 5\}, \{1, 2, 4\},$ 
 $\{-1, 4, 5\}, \{1, 3, 4\}, \{1, 1, 4\}, \{1, 4, 1\}, \{1, 4, 3\}, \{1, 5, 2\}, \{1, 2, 5\}, \{1, 5, 2\},$ 
 $\{1, 4, 2\}, \{1, 3, 2\}, \{-1, 5, 4\}, \{-1, 4, 5\}, \{-1, 5, 4\}, \{-1, 4, 5\}, \{-1, 5, 4\},$ 
 $\{-1, 2, 1\}, \{-1, 3, 1\}, \{-1, 1, 3\}, \{-1, 1, 2\}, \{-1, 2, 1\}, \{-1, 3, 1\}, \{1, 2, 3\},$ 
 $\{1, 3, 2\}, \{-1, 1, 3\}, \{-1, 5, 3\}, \{1, 3, 4\}, \{1, 4, 3\}, \{1, 5, 3\}, \{1, 1, 3\}, \{1, 2, 3\},$ 
 $\{1, 3, 2\}, \{1, 3, 1\}, \{1, 3, 5\}, \{1, 3, 4\}, \{-1, 3, 4\}, \{1, 5, 3\}, \{1, 1, 3\}, \{-1, 3, 2\},$ 
 $\{-1, 2, 3\}, \{1, 3, 1\}, \{1, 2, 1\}, \{1, 1, 2\}, \{1, 1, 3\}, \{1, 3, 1\}, \{1, 2, 1\}, \{1, 5, 4\},$ 
 $\{1, 4, 5\}, \{1, 5, 4\}, \{1, 4, 5\}, \{1, 5, 4\}]] /. \{ \{1, i_, j_ \} \Rightarrow \sigma_{i,j}, \{-1, i_, j_ \} \Rightarrow \bar{\sigma}_{i,j} \}$ 
```

(Alt) Out[]:=

```
VPB[5,  $\bar{\sigma}_{3,2}$ ,  $\bar{\sigma}_{4,2}$ ,  $\bar{\sigma}_{5,2}$ ,  $\bar{\sigma}_{2,5}$ ,  $\bar{\sigma}_{5,2}$ ,  $\bar{\sigma}_{4,3}$ ,  $\bar{\sigma}_{4,1}$ ,  $\bar{\sigma}_{1,4}$ ,  $\bar{\sigma}_{3,4}$ ,  $\sigma_{4,5}$ ,  $\bar{\sigma}_{2,4}$ ,  $\bar{\sigma}_{2,5}$ ,  $\sigma_{3,2}$ ,  $\sigma_{1,2}$ ,
 $\sigma_{2,1}$ ,  $\sigma_{2,3}$ ,  $\sigma_{5,4}$ ,  $\sigma_{4,5}$ ,  $\sigma_{5,4}$ ,  $\sigma_{2,4}$ ,  $\sigma_{3,4}$ ,  $\bar{\sigma}_{5,2}$ ,  $\bar{\sigma}_{2,5}$ ,  $\bar{\sigma}_{5,2}$ ,  $\bar{\sigma}_{2,5}$ ,  $\bar{\sigma}_{5,2}$ ,  $\bar{\sigma}_{4,1}$ ,  $\bar{\sigma}_{3,1}$ ,  $\bar{\sigma}_{1,3}$ ,
 $\bar{\sigma}_{1,4}$ ,  $\bar{\sigma}_{4,1}$ ,  $\bar{\sigma}_{3,1}$ ,  $\sigma_{4,3}$ ,  $\sigma_{3,4}$ ,  $\bar{\sigma}_{1,3}$ ,  $\bar{\sigma}_{5,3}$ ,  $\sigma_{3,2}$ ,  $\bar{\sigma}_{3,2}$ ,  $\bar{\sigma}_{3,5}$ ,  $\bar{\sigma}_{3,1}$ ,  $\bar{\sigma}_{3,4}$ ,  $\bar{\sigma}_{4,3}$ ,  $\bar{\sigma}_{1,3}$ ,  $\bar{\sigma}_{5,3}$ ,
 $\bar{\sigma}_{2,3}$ ,  $\bar{\sigma}_{3,2}$ ,  $\sigma_{5,3}$ ,  $\sigma_{1,3}$ ,  $\bar{\sigma}_{3,4}$ ,  $\bar{\sigma}_{4,3}$ ,  $\sigma_{3,1}$ ,  $\sigma_{4,1}$ ,  $\sigma_{1,4}$ ,  $\sigma_{1,3}$ ,  $\sigma_{3,1}$ ,  $\sigma_{4,1}$ ,  $\sigma_{5,2}$ ,  $\sigma_{2,5}$ ,  $\sigma_{5,2}$ ,  $\sigma_{2,5}$ ,
 $\sigma_{5,2}$ ,  $\bar{\sigma}_{3,4}$ ,  $\bar{\sigma}_{2,4}$ ,  $\bar{\sigma}_{5,4}$ ,  $\bar{\sigma}_{4,5}$ ,  $\bar{\sigma}_{5,4}$ ,  $\bar{\sigma}_{2,3}$ ,  $\bar{\sigma}_{2,1}$ ,  $\bar{\sigma}_{1,2}$ ,  $\bar{\sigma}_{3,2}$ ,  $\sigma_{2,5}$ ,  $\sigma_{2,4}$ ,  $\bar{\sigma}_{4,5}$ ,  $\sigma_{3,4}$ ,  $\sigma_{1,4}$ ,
 $\sigma_{4,1}$ ,  $\sigma_{4,3}$ ,  $\sigma_{5,2}$ ,  $\sigma_{2,5}$ ,  $\sigma_{5,2}$ ,  $\sigma_{4,2}$ ,  $\sigma_{3,2}$ ,  $\bar{\sigma}_{5,4}$ ,  $\bar{\sigma}_{4,5}$ ,  $\bar{\sigma}_{5,4}$ ,  $\bar{\sigma}_{4,5}$ ,  $\bar{\sigma}_{5,4}$ ,  $\bar{\sigma}_{2,1}$ ,  $\bar{\sigma}_{3,1}$ ,  $\bar{\sigma}_{1,3}$ ,
 $\bar{\sigma}_{1,2}$ ,  $\bar{\sigma}_{2,1}$ ,  $\bar{\sigma}_{3,1}$ ,  $\sigma_{2,3}$ ,  $\sigma_{3,2}$ ,  $\bar{\sigma}_{1,3}$ ,  $\bar{\sigma}_{5,3}$ ,  $\sigma_{3,4}$ ,  $\sigma_{4,3}$ ,  $\sigma_{5,3}$ ,  $\sigma_{1,3}$ ,  $\sigma_{2,3}$ ,  $\sigma_{3,2}$ ,  $\sigma_{3,1}$ ,  $\sigma_{3,5}$ ,  $\sigma_{3,4}$ ,
 $\bar{\sigma}_{3,4}$ ,  $\sigma_{5,3}$ ,  $\sigma_{1,3}$ ,  $\bar{\sigma}_{3,2}$ ,  $\bar{\sigma}_{2,3}$ ,  $\sigma_{3,1}$ ,  $\sigma_{2,1}$ ,  $\sigma_{1,2}$ ,  $\sigma_{1,3}$ ,  $\sigma_{3,1}$ ,  $\sigma_{2,1}$ ,  $\sigma_{5,4}$ ,  $\sigma_{4,5}$ ,  $\sigma_{5,4}$ ,  $\sigma_{4,5}$ ,  $\sigma_{5,4}$ ]
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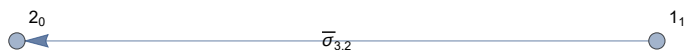
(Alt) In[]:= Length@ $\beta - 1$

(Alt) Out[]:= 122

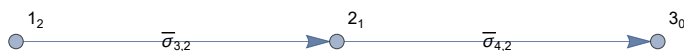
(Alt) In[]:=

```
tab = Table[
  Echo@{k - 1, Take[ $\beta$ , k]};
  Echo@ExtractionGraph[Take[ $\beta$ , k]],
  {k, 2, Length[ $\beta$ ] }
];
```

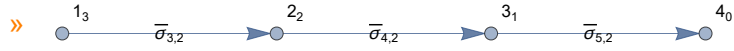
» {1, VPB[5, $\bar{\sigma}_{3,2}$] }

» 

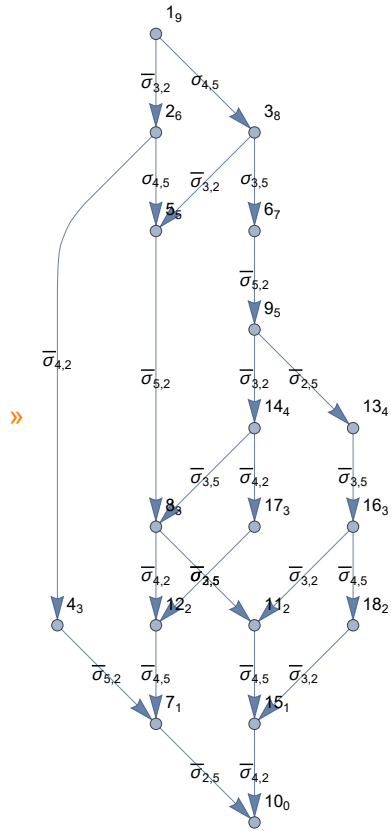
» {2, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$] }

» 

» {3, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$] }



» {4, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$] }

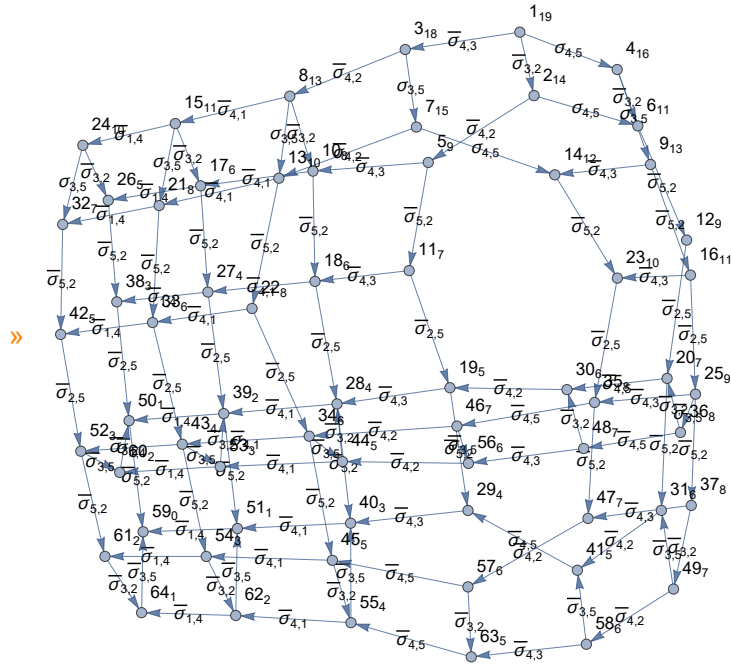


» {5, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$] }

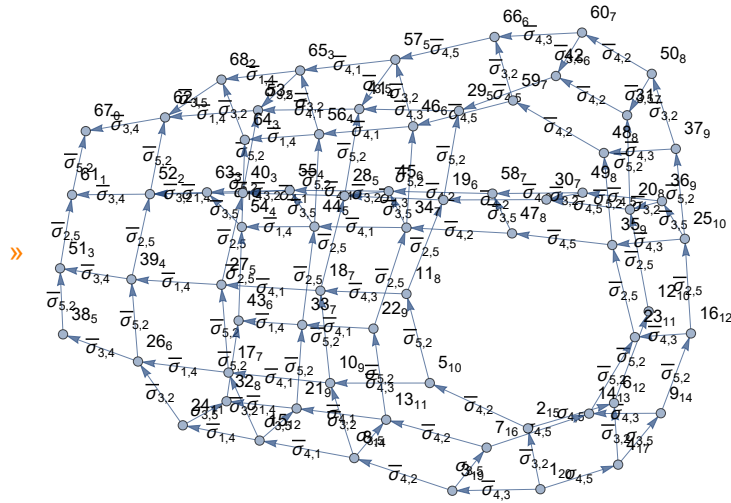


» $\{6, \text{VPB}[5, \bar{\sigma}_{3,2}, \bar{\sigma}_{4,2}, \bar{\sigma}_{5,2}, \bar{\sigma}_{2,5}, \bar{\sigma}_{5,2}, \bar{\sigma}_{4,3}]\}$

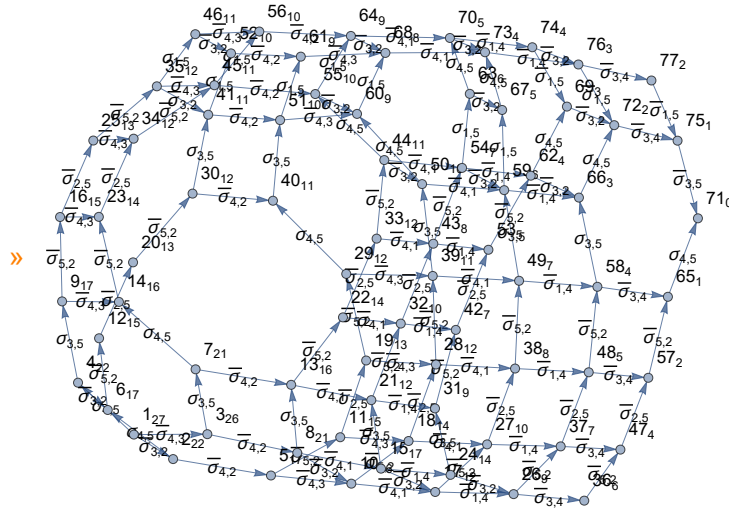




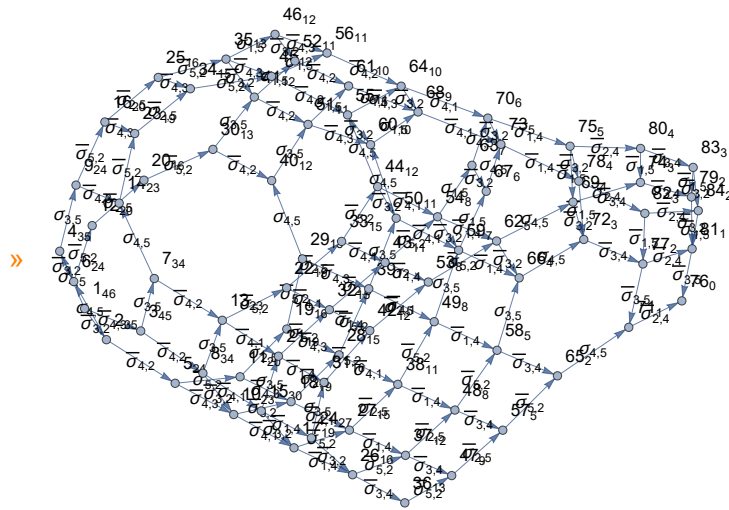
» {9, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$] }



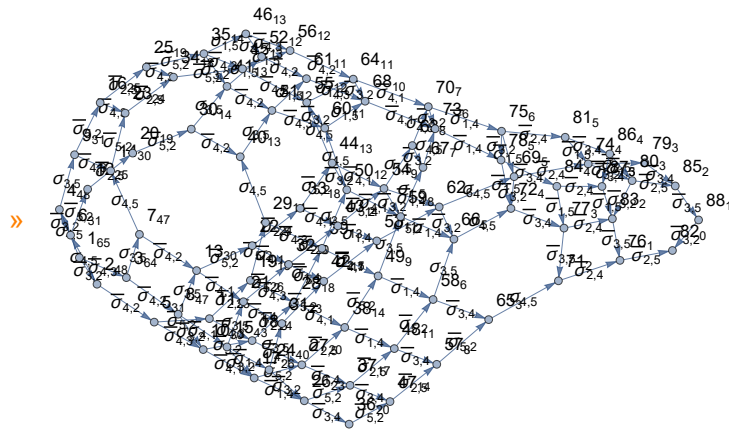
» {10, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$] }



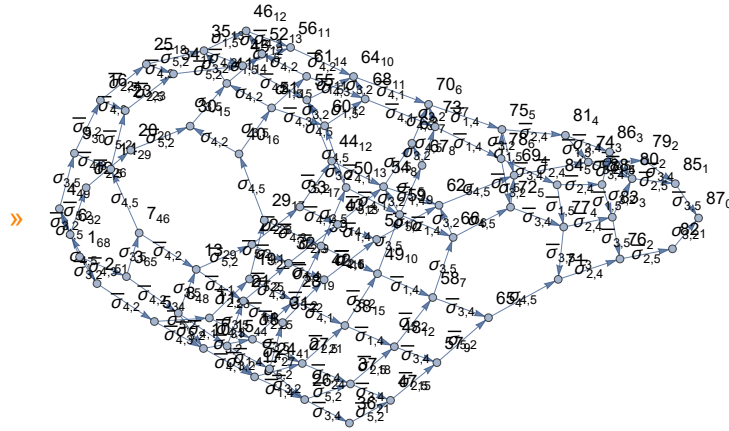
» {11, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$] }



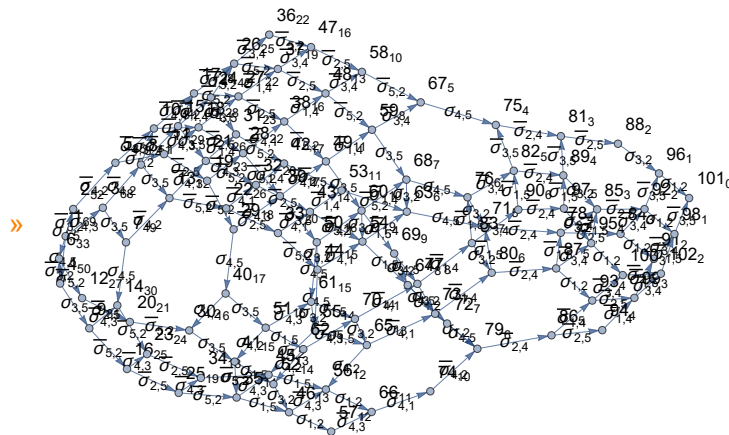
» {12, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$] }



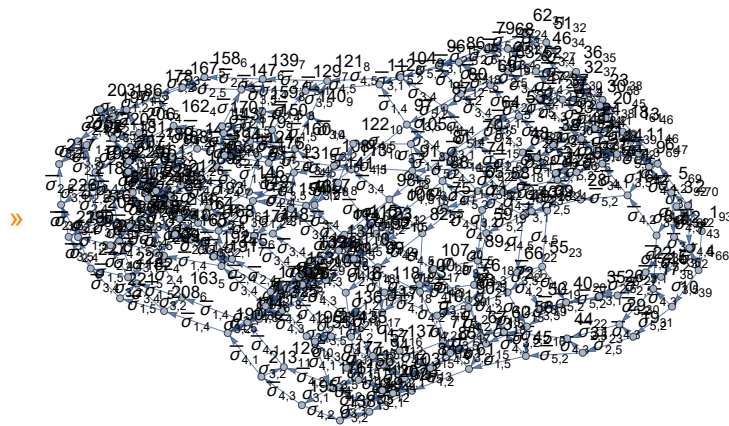
» {13, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$, $\sigma_{3,2}$] }



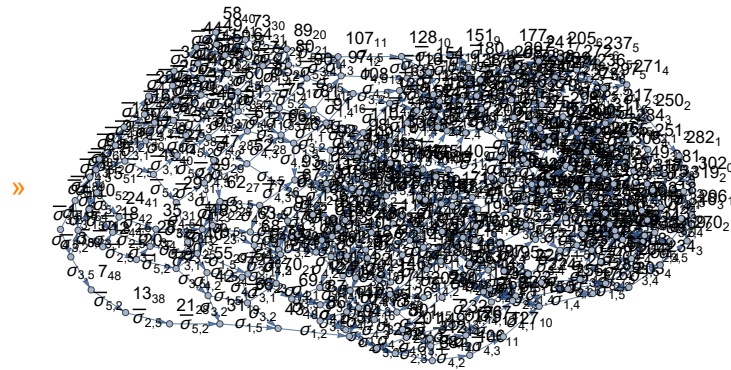
» {14, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$, $\sigma_{3,2}$, $\sigma_{1,2}$] }



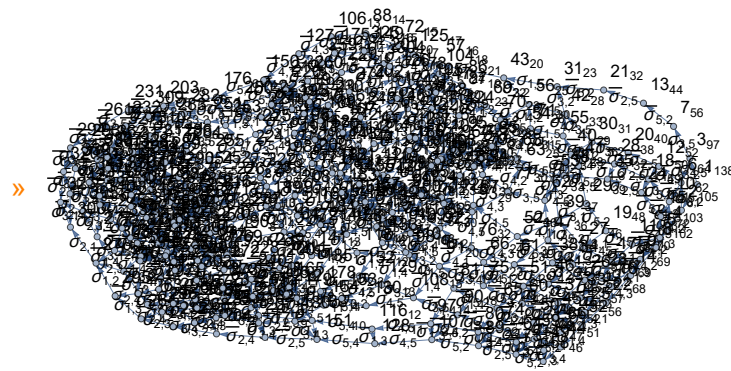
» {15, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$, $\sigma_{3,2}$, $\sigma_{1,2}$, $\sigma_{2,1}$] }



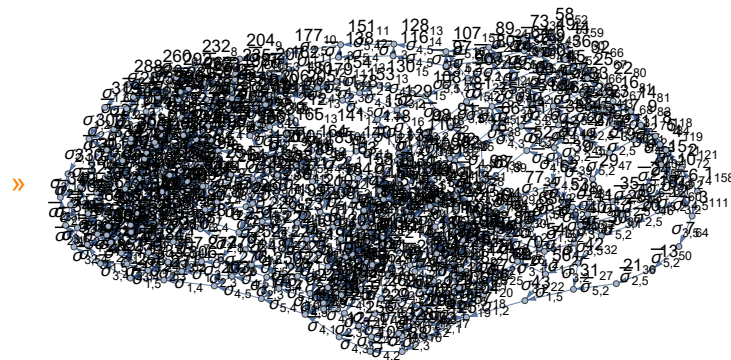
» {16, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$, $\sigma_{3,2}$, $\sigma_{1,2}$, $\sigma_{2,1}$, $\sigma_{2,3}$] }



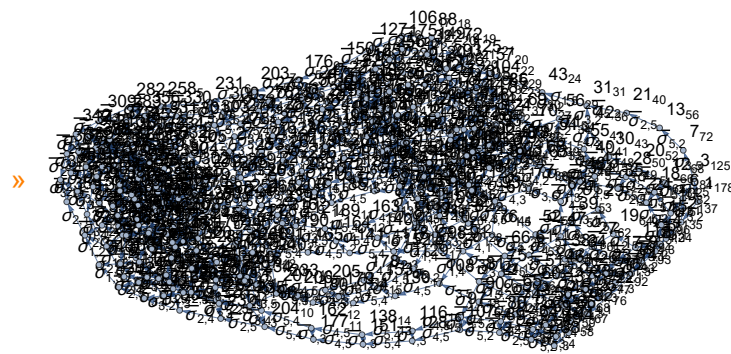
» {17, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$, $\sigma_{3,2}$, $\sigma_{1,2}$, $\sigma_{2,1}$, $\sigma_{2,3}$, $\sigma_{5,4}$] }



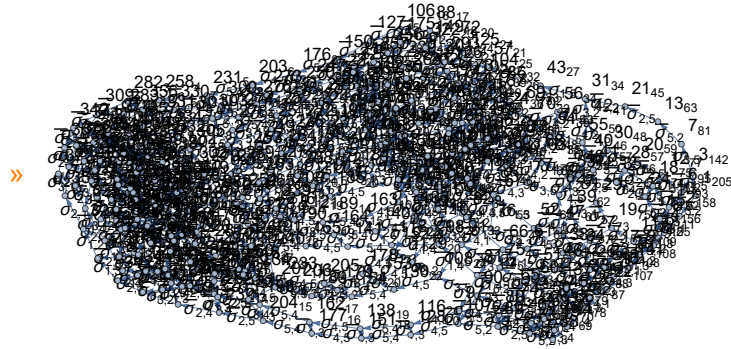
» {18, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$, $\sigma_{3,2}$, $\sigma_{1,2}$, $\sigma_{2,1}$, $\sigma_{2,3}$, $\sigma_{5,4}$, $\sigma_{4,5}$] }



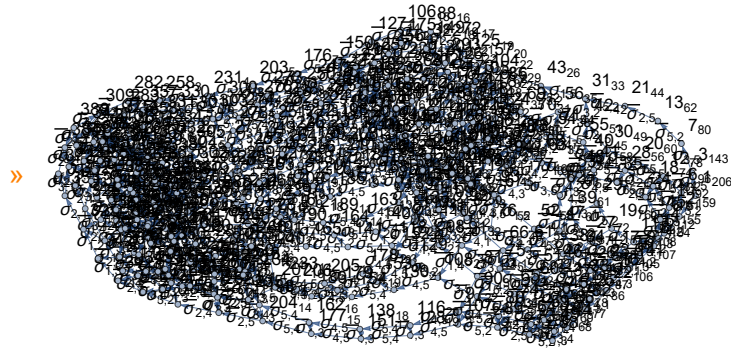
» {19, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$, $\sigma_{4,5}$, $\bar{\sigma}_{2,4}$, $\bar{\sigma}_{2,5}$, $\sigma_{3,2}$, $\sigma_{1,2}$, $\sigma_{2,1}$, $\sigma_{2,3}$, $\sigma_{5,4}$, $\sigma_{4,5}$, $\sigma_{5,4}$] }



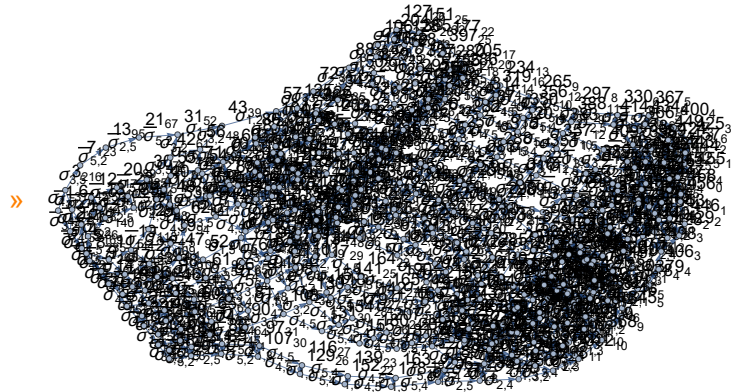
» {20, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$,
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» {21, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$,
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» {22, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$,
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» {23, VPB[5, $\bar{\sigma}_{3,2}$, $\bar{\sigma}_{4,2}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{2,5}$, $\bar{\sigma}_{5,2}$, $\bar{\sigma}_{4,3}$, $\bar{\sigma}_{4,1}$, $\bar{\sigma}_{1,4}$, $\bar{\sigma}_{3,4}$,
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