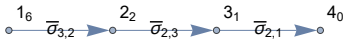
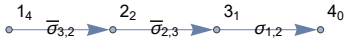
Pensieve header: All extraction graphs of all small-complexity classical braids.

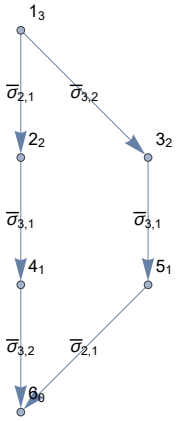
In[•]:=
```
SetDirectory@"C:\\drorbn\\AcademicPensieve\\Projects\\OU";
<< "OU-Programs.m"
```

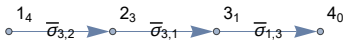
```
Loading KnotTheory` version of February 2, 2020, 10:53:45.2097.
Read more at http://katlas.org/wiki/KnotTheory.
```

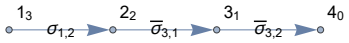
In[•]:=
```
g33 = Echo[# → ExtractionGraph[#]] & /@
   DeleteCases[AllBs[3, 3], b_BR /; Length[b[[2]]] < 3 ∨ Length[Union[Abs /@ b[[2]]]] < 2];
```

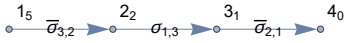
» BR[3, {-2, -2, -1}] → 

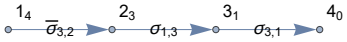
» BR[3, {-2, -2, 1}] → 

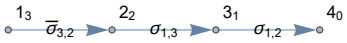
» BR[3, {-2, -1, -2}] → 

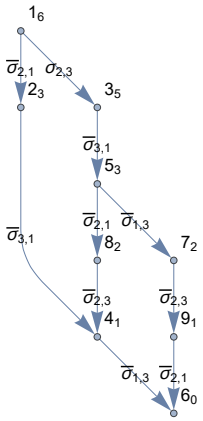
» BR[3, {-2, -1, -1}] → 

» BR[3, {-2, -1, 2}] → 

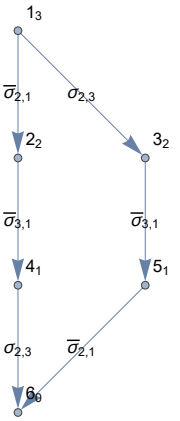
» BR[3, {-2, 1, -2}] → 

» BR[3, {-2, 1, 1}] → 

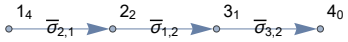
» BR[3, {-2, 1, 2}] → 

» BR[3, {-1, -2, -2}] → 

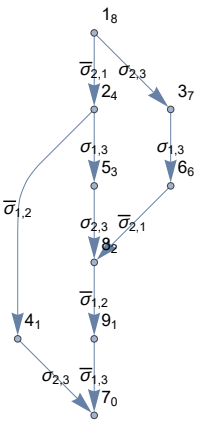
» BR[3, {-1, -2, 1}] →



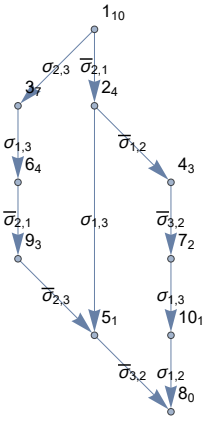
» BR[3, {-1, -1, -2}] →



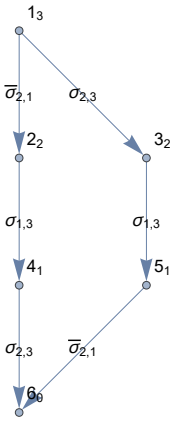
» BR[3, {-1, -1, 2}] →



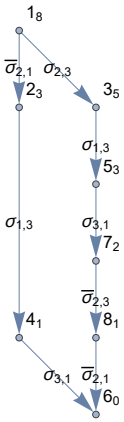
» BR[3, {-1, 2, -1}] →



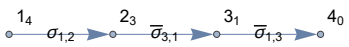
» `BR[3, {-1, 2, 1}]` →



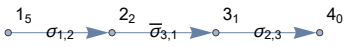
» `BR[3, {-1, 2, 2}]` →



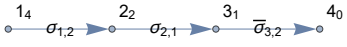
» `BR[3, {1, -2, -2}]` →



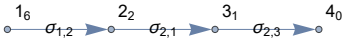
» `BR[3, {1, -2, 1}]` →



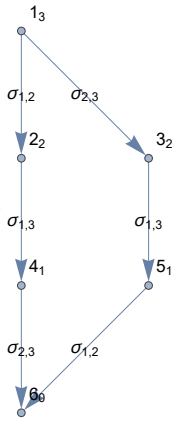
» `BR[3, {1, 1, -2}]` →



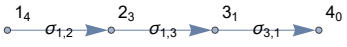
» `BR[3, {1, 1, 2}]` →



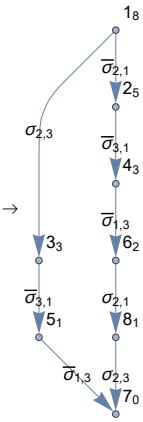
» `BR[3, {1, 2, 1}]` →



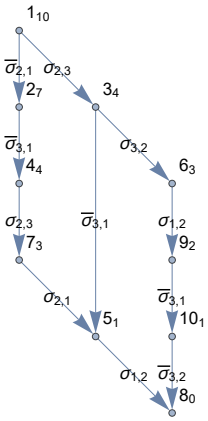
» `BR[3, {1, 2, 2}]` →



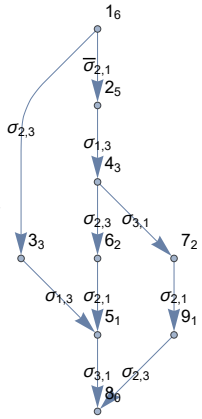
» `BR[3, {2, -1, -1}] →`

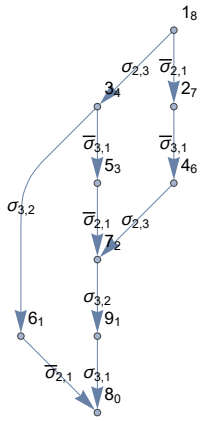


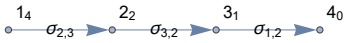
» `BR[3, {2, -1, 2}] →`



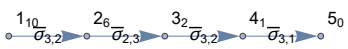
» `BR[3, {2, 1, 1}] →`

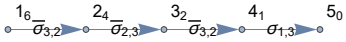


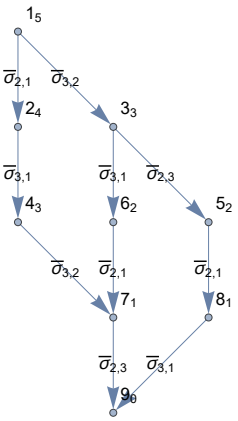
» BR[3, {2, 2, -1}] → 

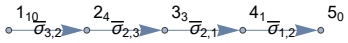
» BR[3, {2, 2, 1}] → 

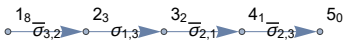
In[•]:=
```
g34 = Echo[# → ExtractionGraph[#]] & /@
    DeleteCases[AllBs[3, 4], b_BR /; Length[b[[2]]] < 4 ∨ Length[Union[Abs /@ b[[2]]]] < 2];
```

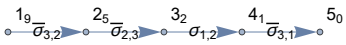
» BR[3, {-2, -2, -2, -1}] → 

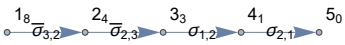
» BR[3, {-2, -2, -2, 1}] → 

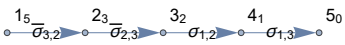
» BR[3, {-2, -2, -1, -2}] → 

» BR[3, {-2, -2, -1, -1}] → 

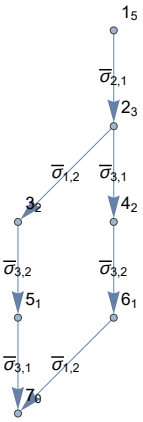
» BR[3, {-2, -2, -1, 2}] → 

» BR[3, {-2, -2, 1, -2}] → 

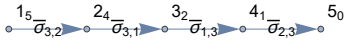
» BR[3, {-2, -2, 1, 1}] → 

» BR[3, {-2, -2, 1, 2}] → 

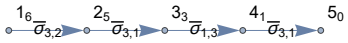
» `BR[3, {-2, -1, -2, -2}]` →



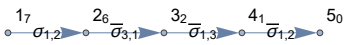
» `BR[3, {-2, -1, -1, -2}]` →



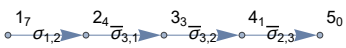
» `BR[3, {-2, -1, -1, -1}]` →



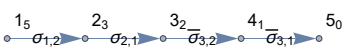
» `BR[3, {-2, -1, -1, 2}]` →



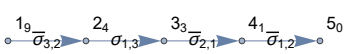
» `BR[3, {-2, -1, 2, -1}]` →



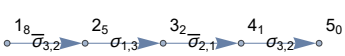
» `BR[3, {-2, -1, 2, 2}]` →



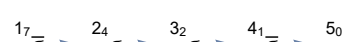
» `BR[3, {-2, 1, -2, -2}]` →



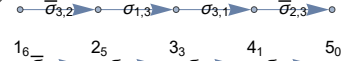
» `BR[3, {-2, 1, -2, 1}]` →



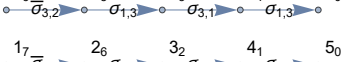
» `BR[3, {-2, 1, 1, -2}]` →



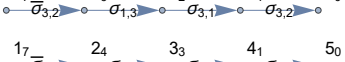
» `BR[3, {-2, 1, 1, 1}]` →



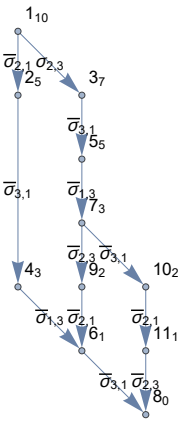
» `BR[3, {-2, 1, 1, 2}]` →



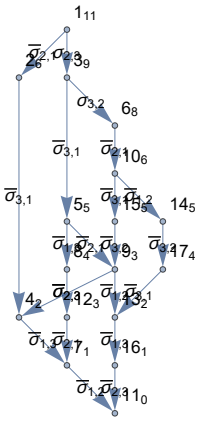
» `BR[3, {-2, 1, 2, 2}]` →



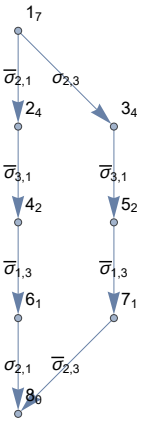
» `BR[3, {-1, -2, -2, -2}]` →



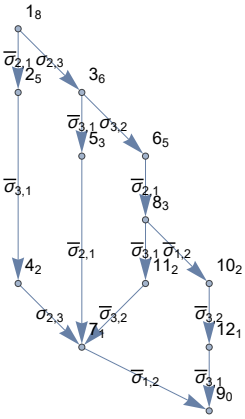
» `BR[3, {-1, -2, -2, -1}] →`



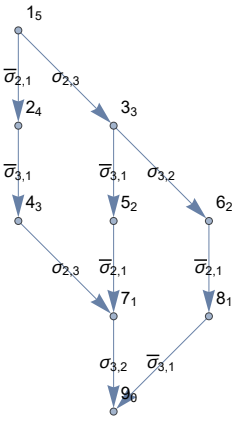
» `BR[3, {-1, -2, -2, 1}] →`



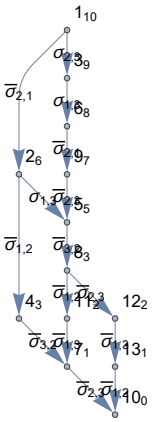
» `BR[3, {-1, -2, 1, -2}] →`



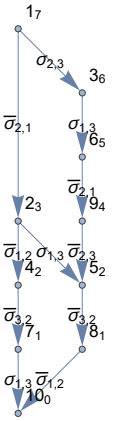
» BR[3, {-1, -2, 1, 1}] →



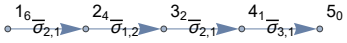
» BR[3, {-1, -1, -2, -2}] →



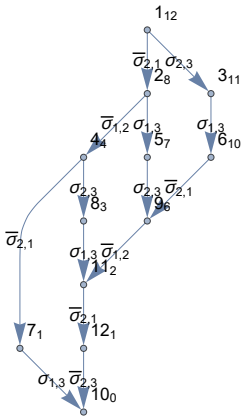
» BR[3, {-1, -1, -2, 1}] →



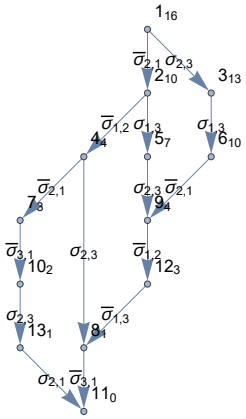
» BR[3, {-1, -1, -1, -2}] →



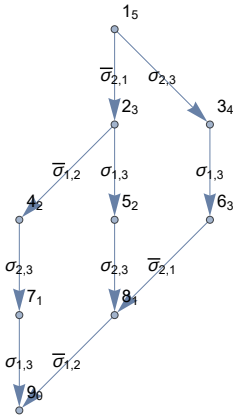
» `BR[3, {-1, -1, -1, 2}]` →



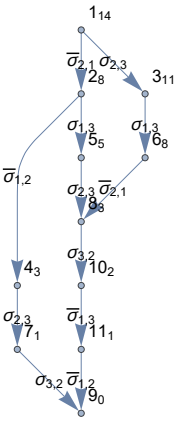
» `BR[3, {-1, -1, 2, -1}]` →



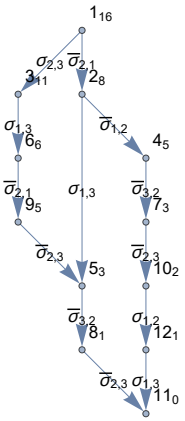
» `BR[3, {-1, -1, 2, 1}]` →



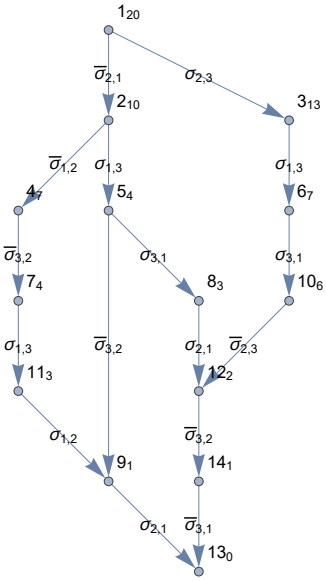
» BR[3, {-1, -1, 2, 2}] →



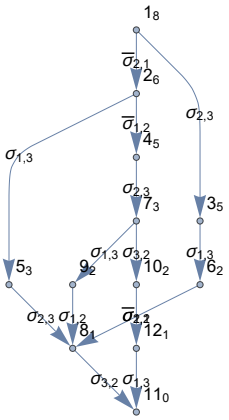
» BR[3, {-1, 2, -1, -1}] →



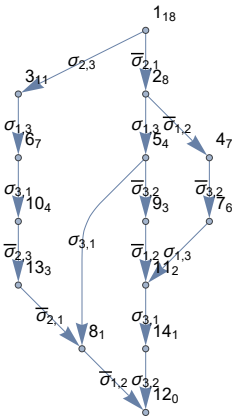
» BR[3, {-1, 2, -1, 2}] →



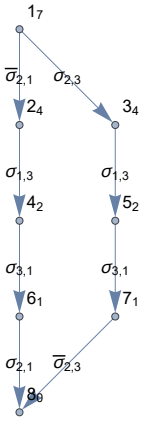
» `BR[3, {-1, 2, 1, 1}] →`



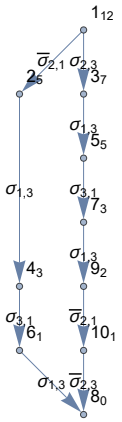
» `BR[3, {-1, 2, 2, -1}] →`

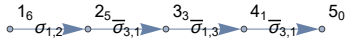


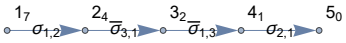
» `BR[3, {-1, 2, 2, 1}] →`

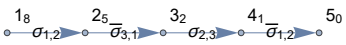


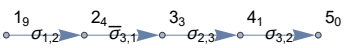
» `BR[3, {-1, 2, 2, 2}]` →

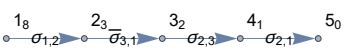


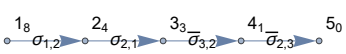
» `BR[3, {1, -2, -2, -2}]` → 

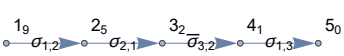
» `BR[3, {1, -2, -2, 1}]` → 

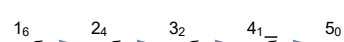
» `BR[3, {1, -2, 1, -2}]` → 

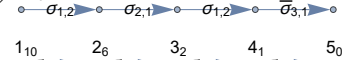
» `BR[3, {1, -2, 1, 1}]` → 

» `BR[3, {1, -2, 1, 2}]` → 

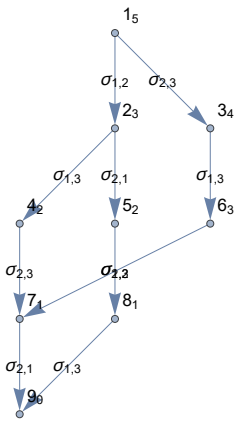
» `BR[3, {1, 1, -2, -2}]` → 

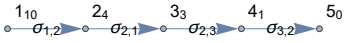
» `BR[3, {1, 1, -2, 1}]` → 

» `BR[3, {1, 1, 1, -2}]` → 

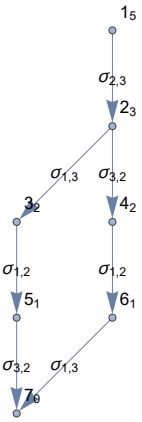
» `BR[3, {1, 1, 1, 2}]` → 

» `BR[3, {1, 1, 2, 1}]` →

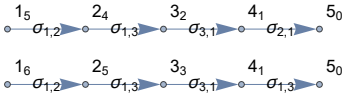


» `BR[3, {1, 1, 2, 2}]` → 

» `BR[3, {1, 2, 1, 1}]` →

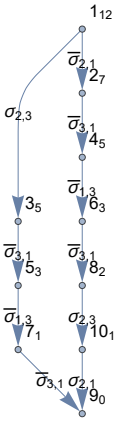


» `BR[3, {1, 2, 2, 1}]` →

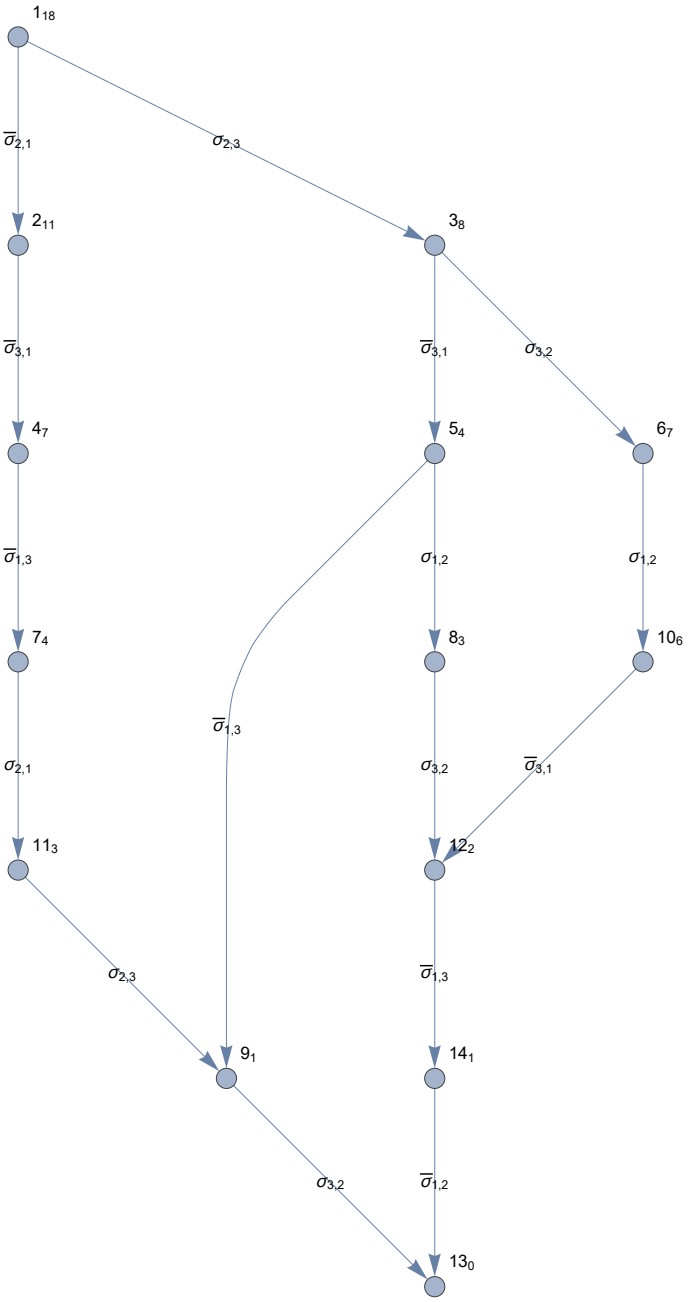


» `BR[3, {1, 2, 2, 2}]` →

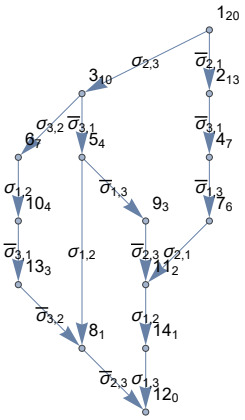
» `BR[3, {2, -1, -1, -1}]` →



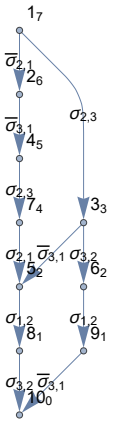
» BR[3, {2, -1, -1, 2}] →


1_{18}
$\overline{\sigma}_{2,1}$
$\sigma_{2,3}$
2_{11}
3_8
$\overline{\sigma}_{3,1}$
$\overline{\sigma}_{3,1}$
$\sigma_{3,2}$
4_7
5_4
6_7
$\overline{\sigma}_{1,3}$
$\sigma_{1,2}$
$\sigma_{1,2}$
7_4
8_3
10_6
$\overline{\sigma}_{1,3}$
$\sigma_{2,1}$
$\sigma_{3,2}$
$\overline{\sigma}_{3,1}$
11_3
12_2
$\sigma_{2,3}$
$\overline{\sigma}_{1,3}$
9_1
14_1
$\sigma_{3,2}$
$\overline{\sigma}_{1,2}$
13_0

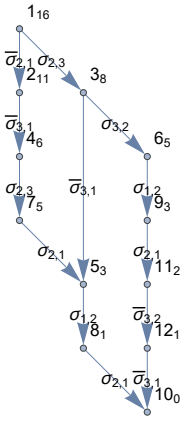
» BR[3, {2, -1, 2, -1}] →



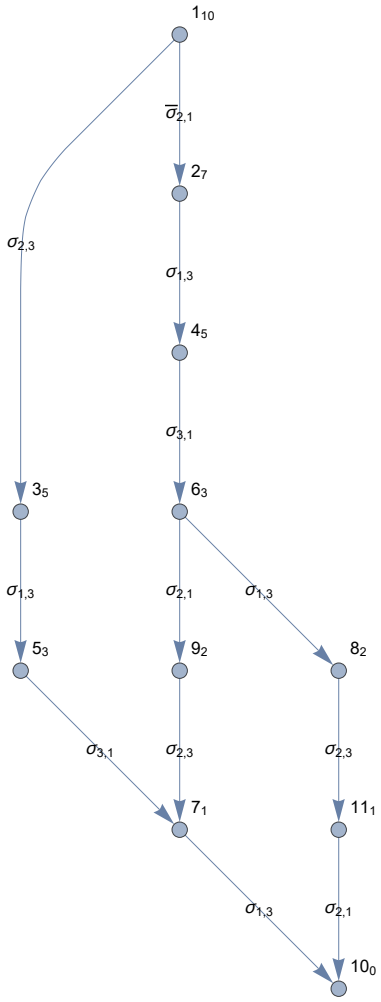
» BR[3, {2, -1, 2, 1}] →



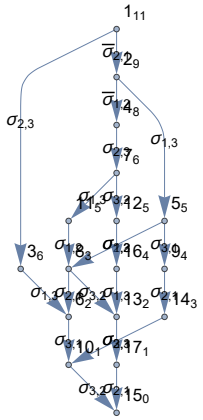
» BR[3, {2, -1, 2, 2}] →



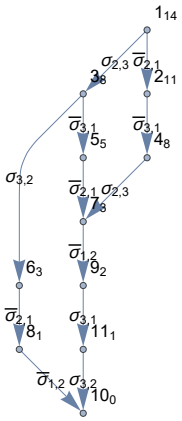
» BR[3, {2, 1, 1, 1}] →



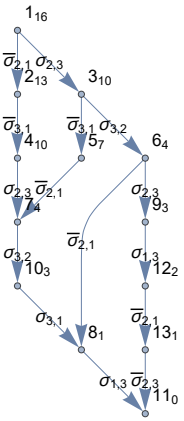
» BR[3, {2, 1, 1, 2}] →



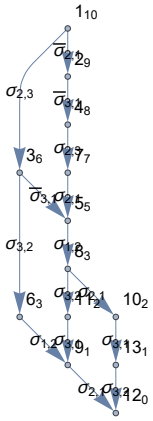
» `BR[3, {2, 2, -1, -1}] →`



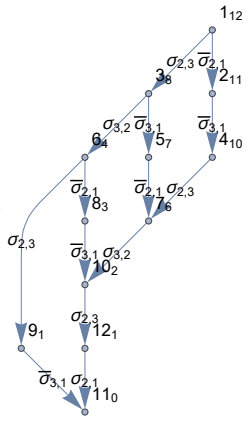
» `BR[3, {2, 2, -1, 2}] →`



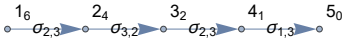
» `BR[3, {2, 2, 1, 1}] →`



» BR[3, {2, 2, 2, -1}] →



» BR[3, {2, 2, 2, 1}] →



In[•]:=
```
g35 = Echo[# → ExtractionGraph[#]] & /@
    DeleteCases[AllBs[3, 5], b_BR /; Length[b[[2]]] < 5 ∨ Length[Union[Abs /@ b[[2]]]] < 2];
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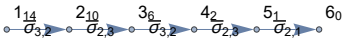
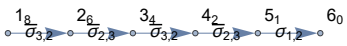
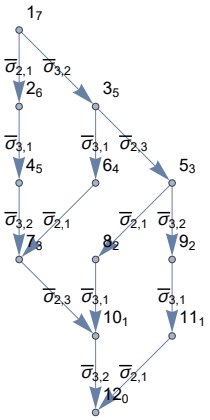
» BR[3, {-2, -2, -2, -2, -1}] →



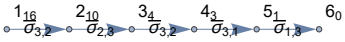
» BR[3, {-2, -2, -2, -2, 1}] →



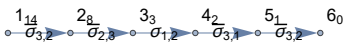
» BR[3, {-2, -2, -2, -1, -2}] →



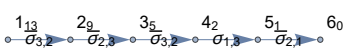
» BR[3, {-2, -2, -2, -1, -1}] →



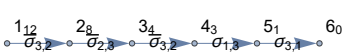
» BR[3, {-2, -2, -2, -1, 2}] →



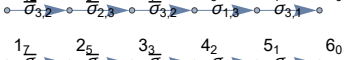
» BR[3, {-2, -2, -2, 1, -2}] →



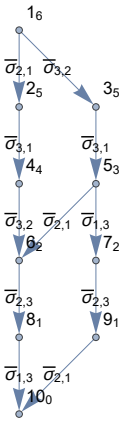
» BR[3, {-2, -2, -2, 1, 1}] →



» BR[3, {-2, -2, -2, 1, 2}] →



» BR[3, {-2, -2, -1, -2, -2}] →



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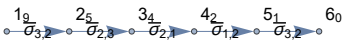

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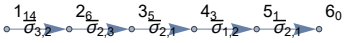

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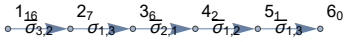

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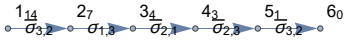

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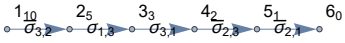

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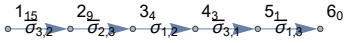

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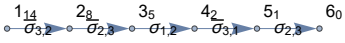

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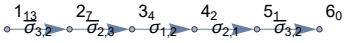

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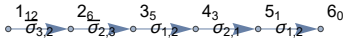

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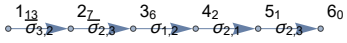

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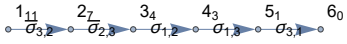

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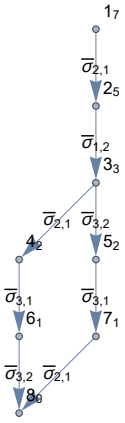

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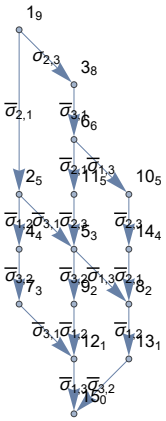

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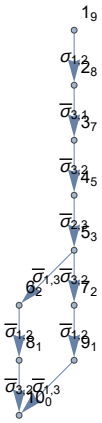
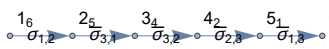
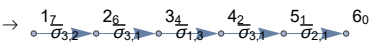
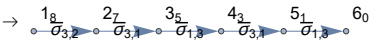
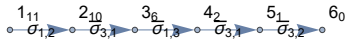
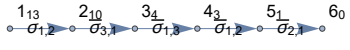


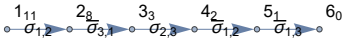
» BR[3, {-2, -1, -1, -2, 1}] → 

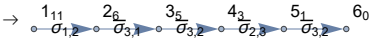
» BR[3, {-2, -1, -1, -1, -2}] → 

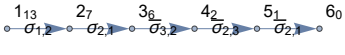
» BR[3, {-2, -1, -1, -1, -1}] → 

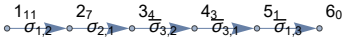
» BR[3, {-2, -1, -1, -1, 2}] → 

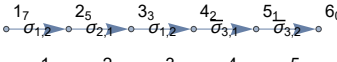
» BR[3, {-2, -1, -1, 2, -1}] → 

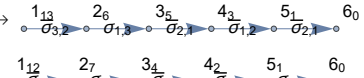
» BR[3, {-2, -1, -1, 2, 2}] → 

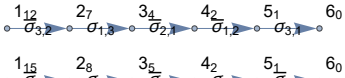
» BR[3, {-2, -1, 2, -1, -1}] → 

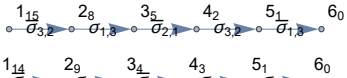
» BR[3, {-2, -1, 2, -1, 2}] → 

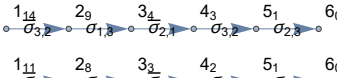
» BR[3, {-2, -1, 2, 2, -1}] → 

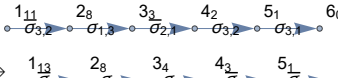
» BR[3, {-2, -1, 2, 2, 2}] → 

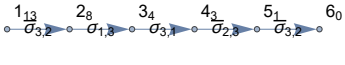
» BR[3, {-2, 1, -2, -2, -2}] → 

» BR[3, {-2, 1, -2, -2, 1}] → 

» BR[3, {-2, 1, -2, 1, -2}] → 

» BR[3, {-2, 1, -2, 1, 1}] → 

» BR[3, {-2, 1, -2, 1, 2}] → 

» BR[3, {-2, 1, 1, -2, -2}] → 

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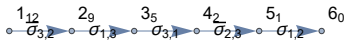

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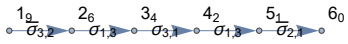

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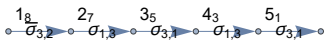

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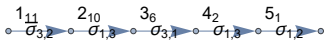

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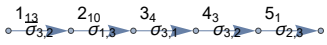

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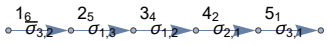

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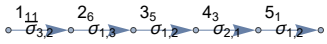

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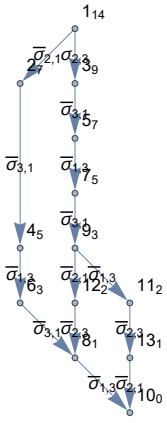

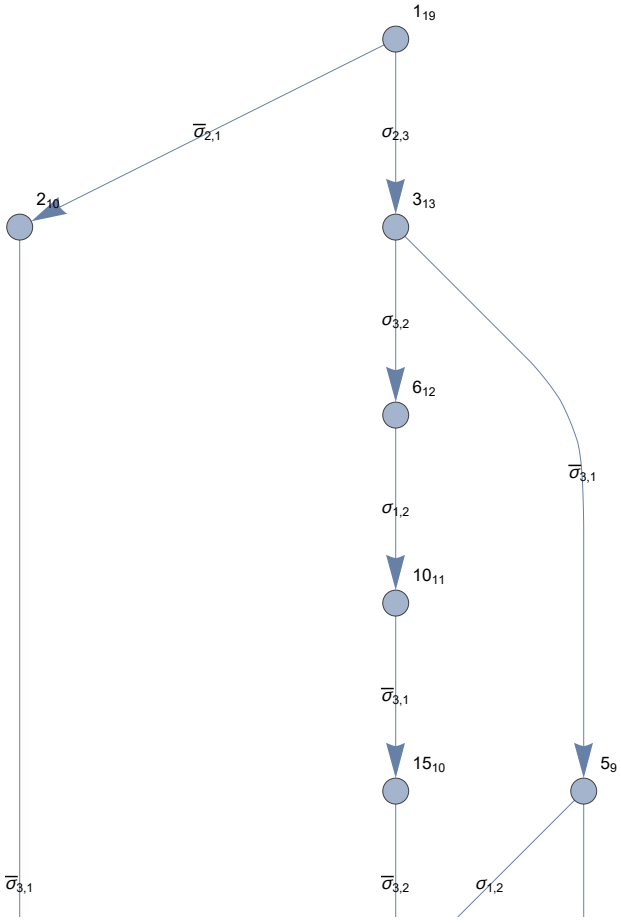

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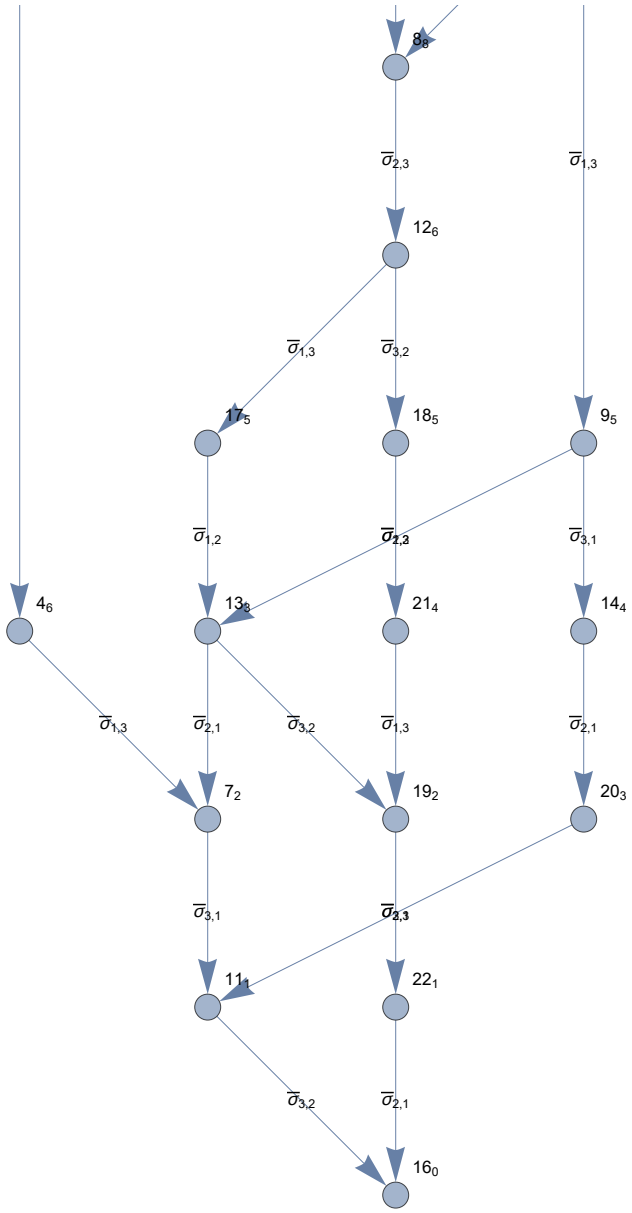

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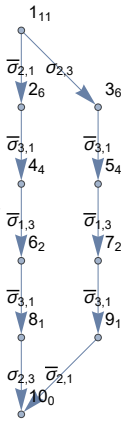

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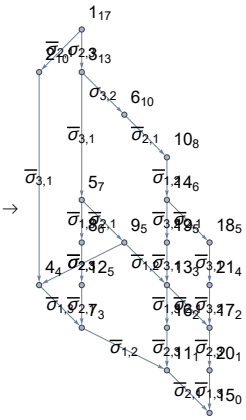
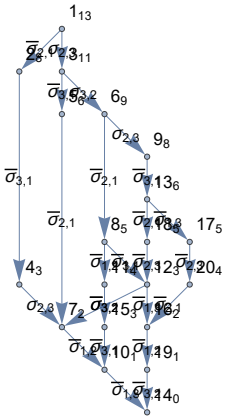


» `BR[3, {-1, -2, -2, -1, 2}]` →



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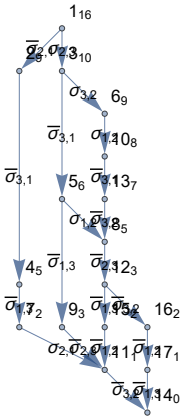

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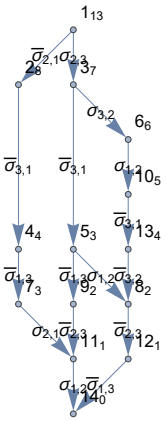

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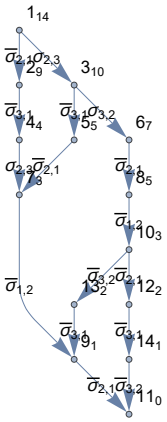

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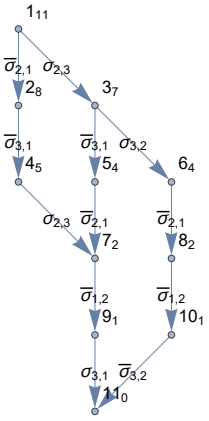

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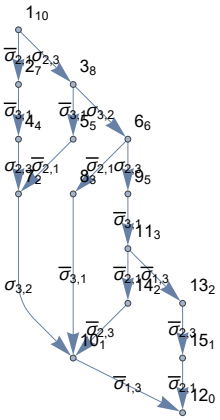
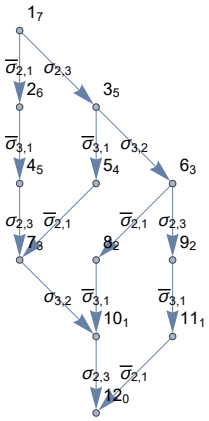
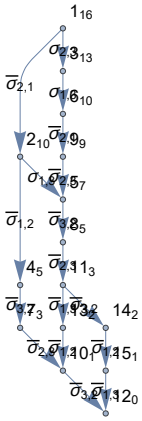


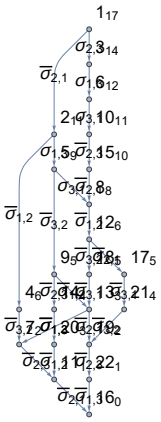
» `BR[3, {-1, -2, 1, 1, 1}] →`



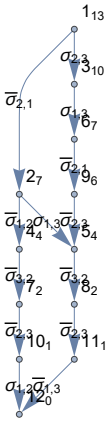
» `BR[3, {-1, -1, -2, -2, -2}] →`



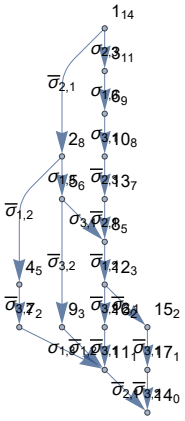
» `BR[3, {-1, -1, -2, -2, -1}]` →



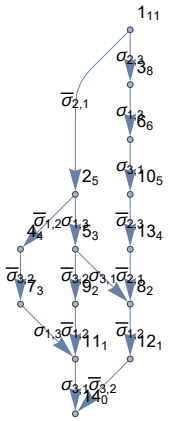
» `BR[3, {-1, -1, -2, -2, 1}]` →



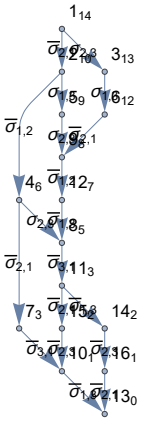
» `BR[3, {-1, -1, -2, 1, -2}]` →



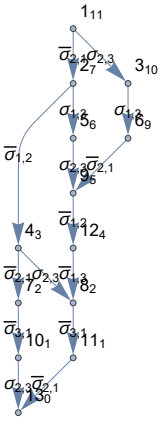
» BR[3, {-1, -1, -2, 1, 1}] →



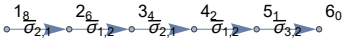
» BR[3, {-1, -1, -1, -2, -2}] →



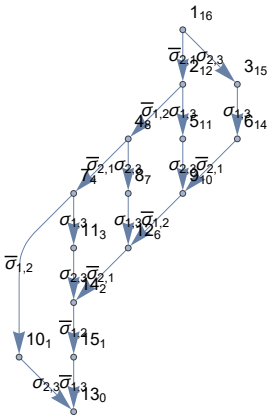
» BR[3, {-1, -1, -1, -2, 1}] →



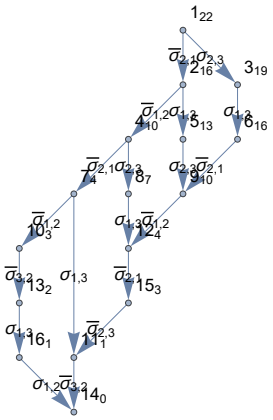
» BR[3, {-1, -1, -1, -1, -2}] →



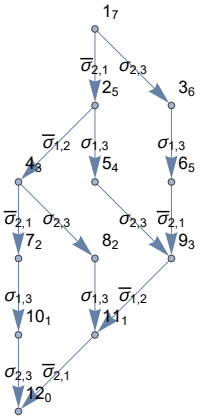
» `BR[3, {-1, -1, -1, -1, 2}] →`



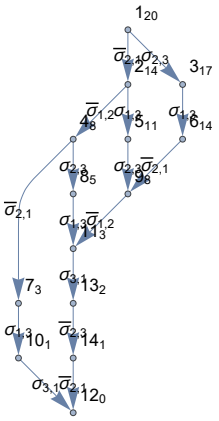
» `BR[3, {-1, -1, -1, 2, -1}] →`



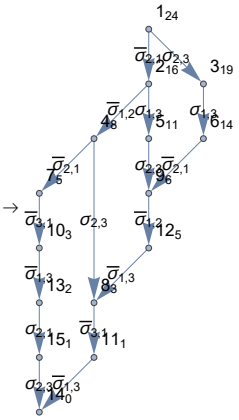
» `BR[3, {-1, -1, -1, 2, 1}] →`



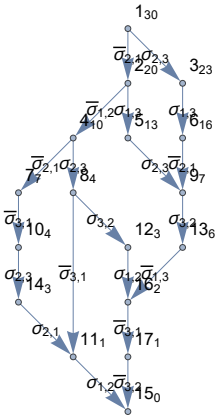
» `BR[3, {-1, -1, -1, 2, 2}] →`



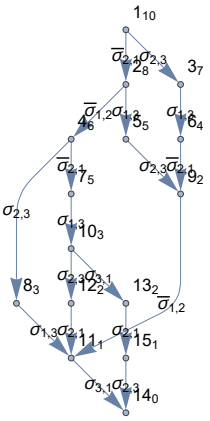
» `BR[3, {-1, -1, 2, -1, -1}] →`



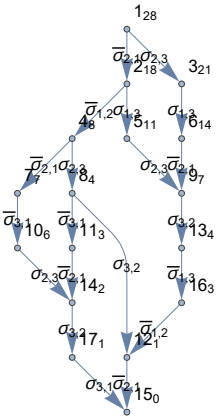
» `BR[3, {-1, -1, 2, -1, 2}] →`



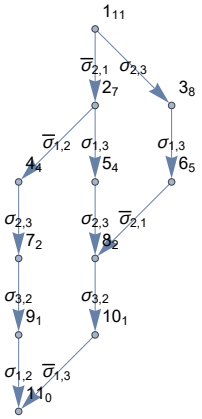
» `BR[3, {-1, -1, 2, 1, 1}]` →



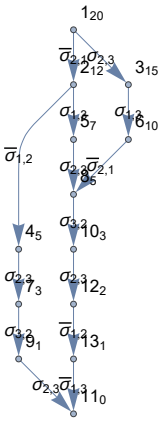
» `BR[3, {-1, -1, 2, 2, -1}]` →



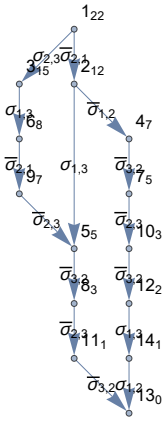
» `BR[3, {-1, -1, 2, 2, 1}]` →



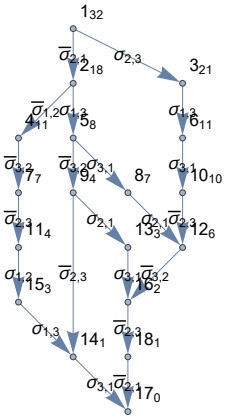
» BR[3, {-1, -1, 2, 2, 2}] →



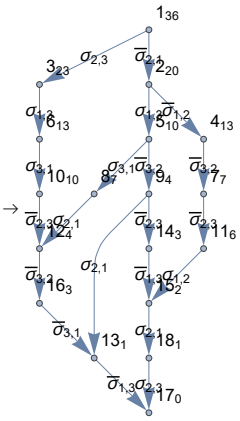
» BR[3, {-1, 2, -1, -1, -1}] →



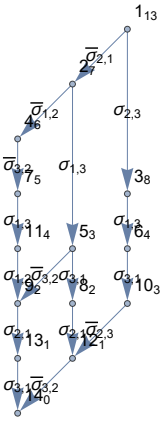
» BR[3, {-1, 2, -1, -1, 2}] →



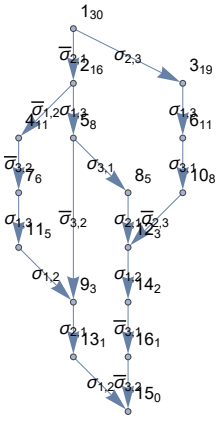
» BR[3, {-1, 2, -1, 2, -1}] →



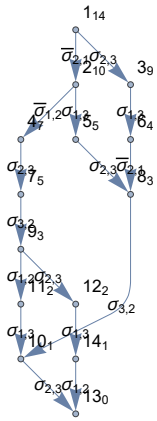
» BR[3, {-1, 2, -1, 2, 1}] →



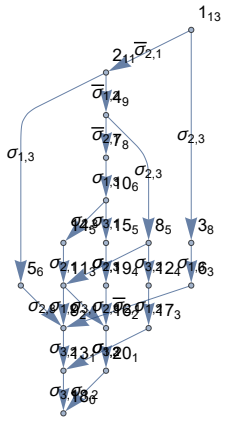
» BR[3, {-1, 2, -1, 2, 2}] →



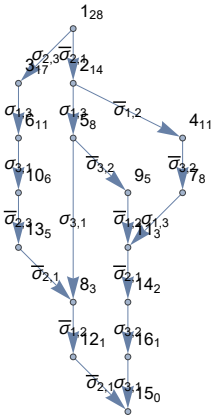
» `BR[3, {-1, 2, 1, 1, 1}]` →



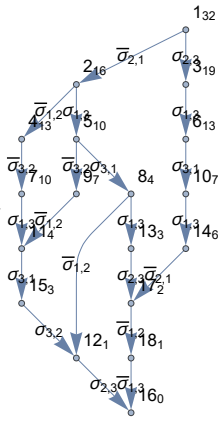
» `BR[3, {-1, 2, 1, 1, 2}]` →



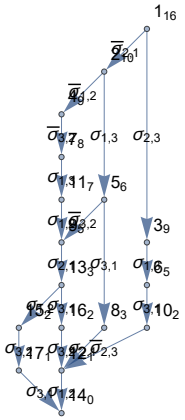
» `BR[3, {-1, 2, 2, -1, -1}]` →



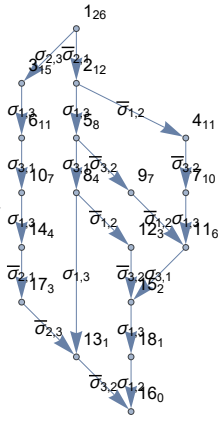
» `BR[3, {-1, 2, 2, -1, 2}]` →



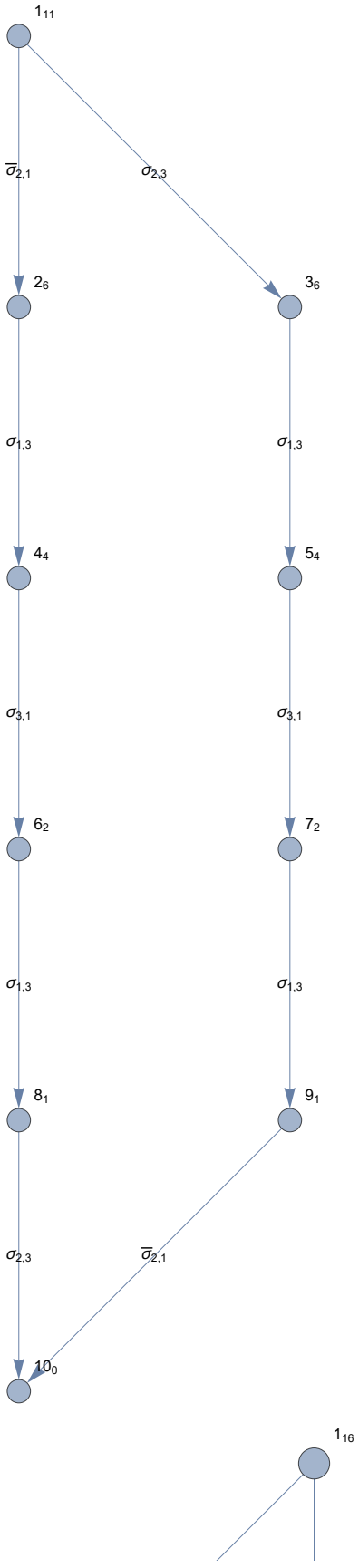
» `BR[3, {-1, 2, 2, 1, 1}]` →



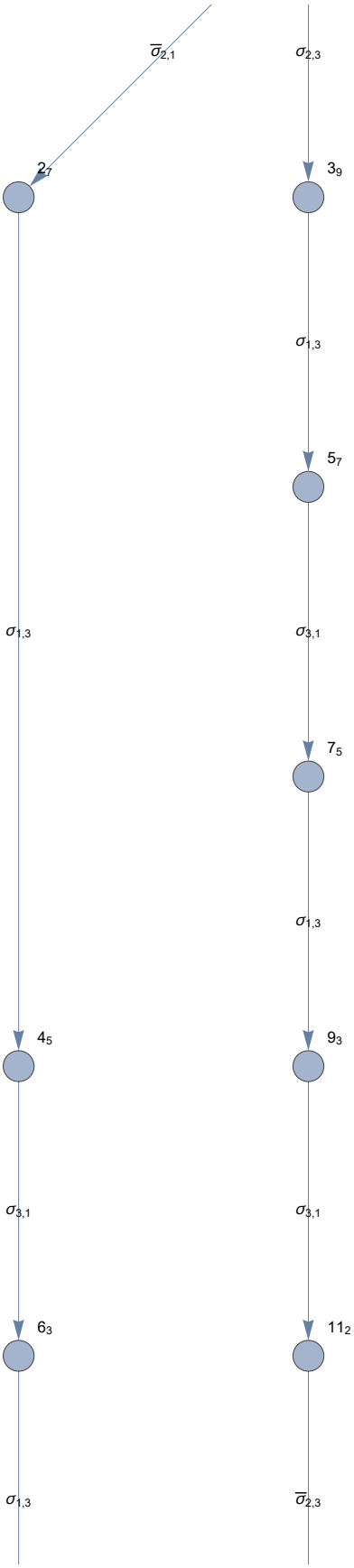
» `BR[3, {-1, 2, 2, 2, -1}]` →

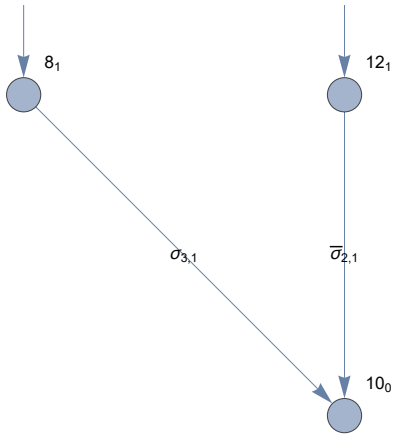


» BR[3, {-1, 2, 2, 2, 1}] →


1_{11}
$\overline{\sigma}_{2,1}$
$\sigma_{2,3}$
2_6
3_6
$\sigma_{1,3}$
$\sigma_{1,3}$
4_4
5_4
$\sigma_{3,1}$
$\sigma_{3,1}$
6_2
7_2
$\sigma_{1,3}$
$\sigma_{1,3}$
8_1
9_1
$\sigma_{2,3}$
$\overline{\sigma}_{2,1}$
10_0
1_{16}

BR[3, {-1, 2, 2, 2, 2}] →


$\overline{\sigma}_{2,1}$
$\sigma_{2,3}$
2_7
3_9
$\sigma_{1,3}$
5_7
$\sigma_{1,3}$
$\sigma_{3,1}$
7_5
$\sigma_{1,3}$
4_5
9_3
$\sigma_{3,1}$
$\sigma_{3,1}$
6_3
11_2
$\sigma_{1,3}$
$\overline{\sigma}_{2,3}$



» BR[3, {1, -2, -2, -2, -2}] →

» BR[3, {1, -2, -2, -2, 1}] →

» BR[3, {1, -2, -2, 1, -2}] →

» BR[3, {1, -2, -2, 1, 1}] →

» BR[3, {1, -2, -2, 1, 2}] →

» BR[3, {1, -2, 1, -2, -2}] →

» BR[3, {1, -2, 1, -2, 1}] →

» BR[3, {1, -2, 1, 1, -2}] →

» BR[3, {1, -2, 1, 1, 1}] →

» BR[3, {1, -2, 1, 1, 2}] →

» BR[3, {1, -2, 1, 2, 2}] →

» BR[3, {1, 1, -2, -2, -2}] →

» BR[3, {1, 1, -2, -2, 1}] →

» BR[3, {1, 1, -2, 1, -2}] →

» BR[3, {1, 1, -2, 1, 1}] →

» BR[3, {1, 1, -2, 1, 2}] →

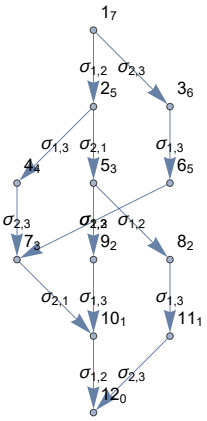
» BR[3, {1, 1, 1, -2, -2}] →

» BR[3, {1, 1, 1, -2, 1}] →

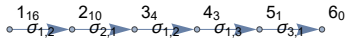
» BR[3, {1, 1, 1, 1, -2}] →

» BR[3, {1, 1, 1, 1, 2}] →

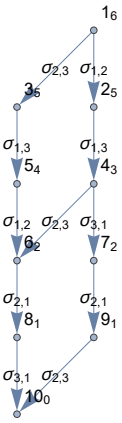
» `BR[3, {1, 1, 1, 2, 1}]` →



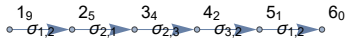
» `BR[3, {1, 1, 1, 2, 2}]` →



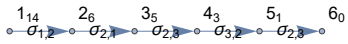
» `BR[3, {1, 1, 2, 1, 1}]` →



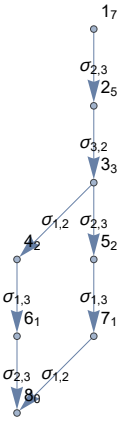
» `BR[3, {1, 1, 2, 2, 1}]` →



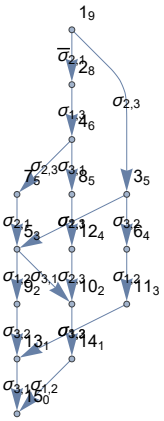
» `BR[3, {1, 1, 2, 2, 2}]` →



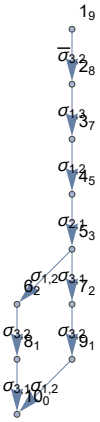
» `BR[3, {1, 2, 1, 1, 1}]` →



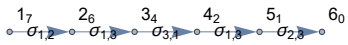
» BR[3, {1, 2, 1, 1, 2}] →



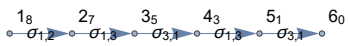
» BR[3, {1, 2, 2, 1, 1}] →



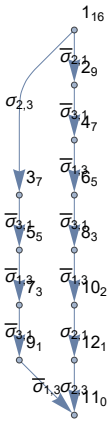
» BR[3, {1, 2, 2, 2, 1}] →



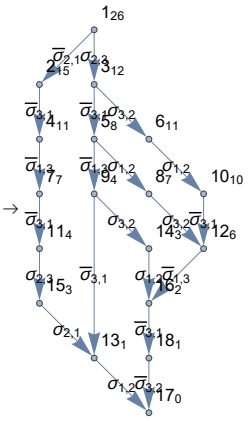
» BR[3, {1, 2, 2, 2, 2}] →



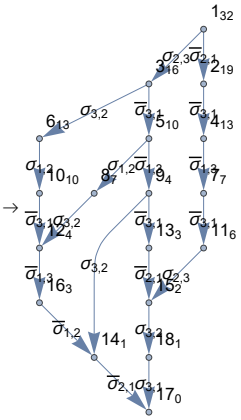
» BR[3, {2, -1, -1, -1, -1}] →



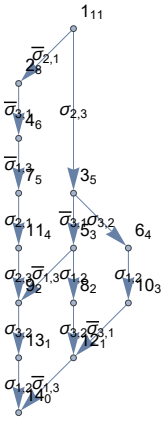
» BR[3, {2, -1, -1, -1, 2}] →



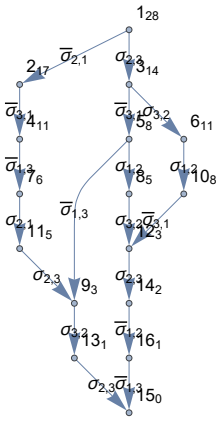
» BR[3, {2, -1, -1, 2, -1}] →



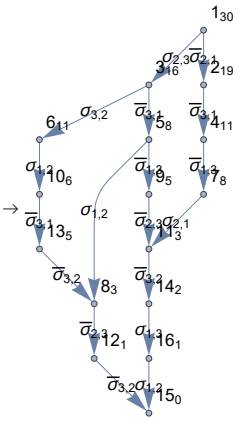
» BR[3, {2, -1, -1, 2, 1}] →



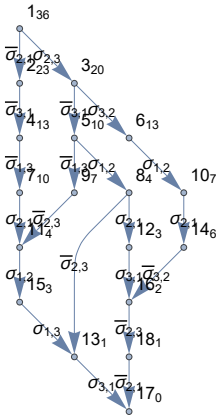
» `BR[3, {2, -1, -1, 2, 2}] →`



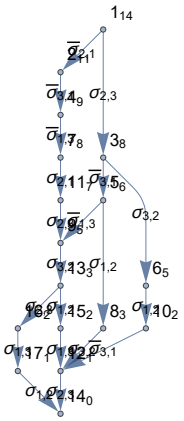
» `BR[3, {2, -1, 2, -1, -1}] →`



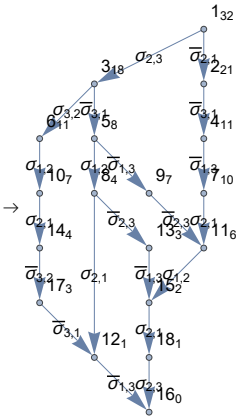
» `BR[3, {2, -1, 2, -1, 2}] →`



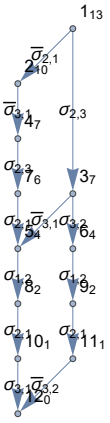
» `BR[3, {2, -1, 2, 1, 1}] →`



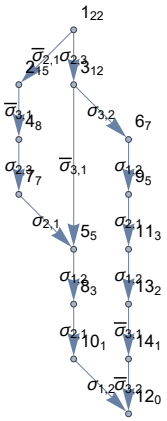
» `BR[3, {2, -1, 2, 2, -1}] →`



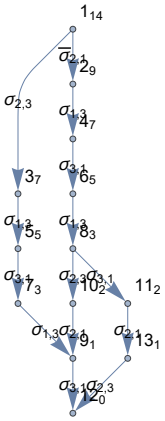
» `BR[3, {2, -1, 2, 2, 1}] →`



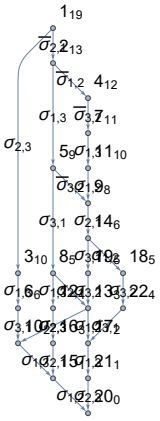
» `BR[3, {2, -1, 2, 2, 2}] →`



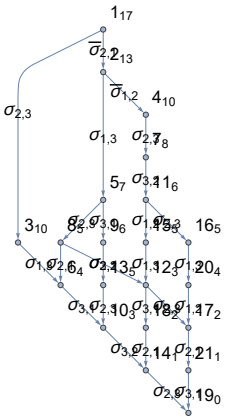
» `BR[3, {2, 1, 1, 1, 1}] →`



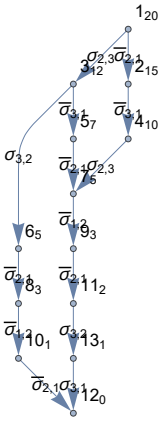
» `BR[3, {2, 1, 1, 1, 2}] →`



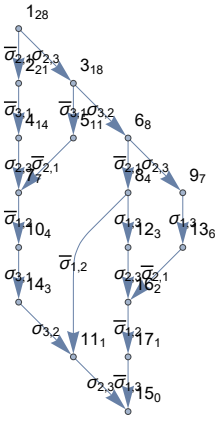
» `BR[3, {2, 1, 1, 2, 2}]` →



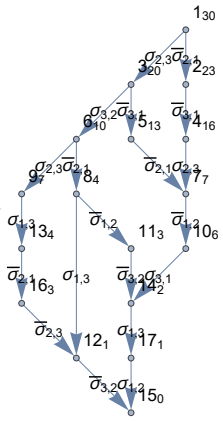
» `BR[3, {2, 2, -1, -1, -1}]` →



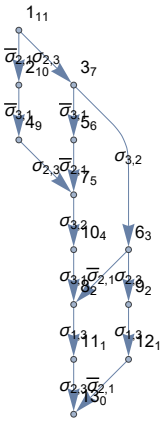
» `BR[3, {2, 2, -1, -1, 2}]` →



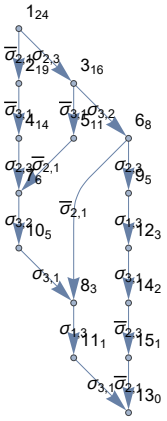
» `BR[3, {2, 2, -1, 2, -1}]` →



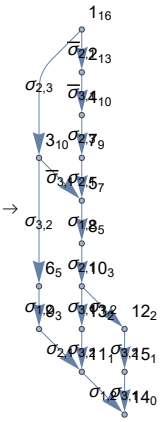
» `BR[3, {2, 2, -1, 2, 1}]` →



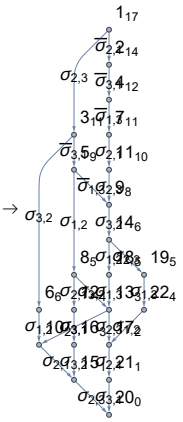
» `BR[3, {2, 2, -1, 2, 2}]` →



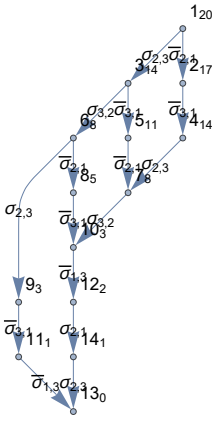
» `BR[3, {2, 2, 1, 1, 1}]` →



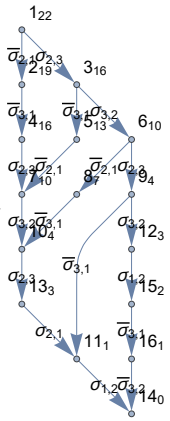
» `BR[3, {2, 2, 1, 1, 2}]` →



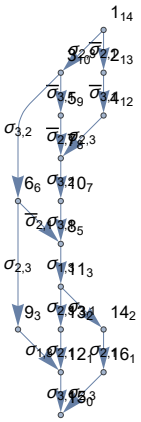
» `BR[3, {2, 2, 2, -1, -1}]` →



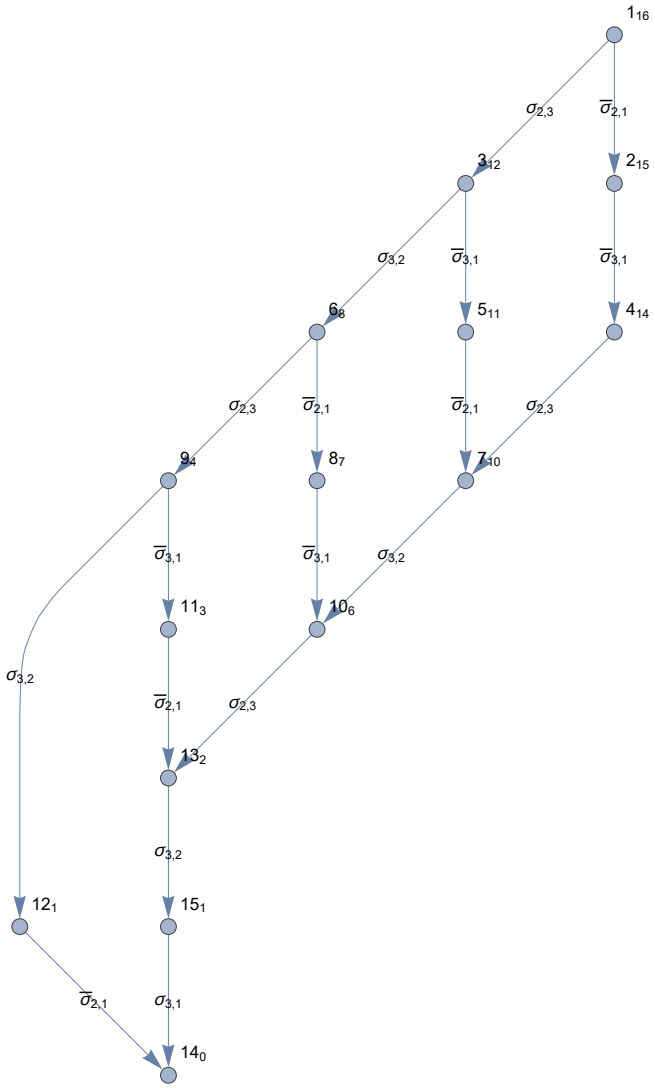
» `BR[3, {2, 2, 2, -1, 2}]` →

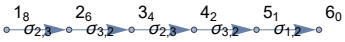


» `BR[3, {2, 2, 2, 1, 1}]` →



» BR[3, {2, 2, 2, 2, -1}] →



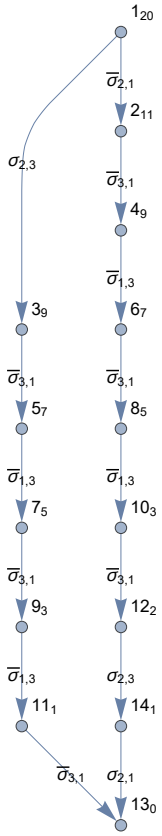
» BR[3, {2, 2, 2, 2, 1}] → 

In[•]:=
```
g44 = Echo[# → ExtractionGraph[#]] & /@
    DeleteCases[AllBs[4, 4], b_BR /; Length[b[[2]]] < 4 ∨ Length[Union[Abs /@ b[[2]]]] < 3];
```

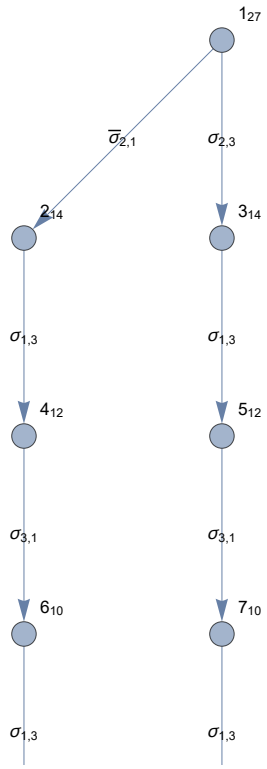
In[•]:=
```
g55 = Echo[# → ExtractionGraph[#]] & /@
    DeleteCases[AllBs[5, 5], b_BR /; Length[b[[2]]] < 5 ∨ Length[Union[Abs /@ b[[2]]]] < 4];
```

In[•]:= **BR[3, {2, -1, -1, -1, -1, -1}] // ExtractionGraph**

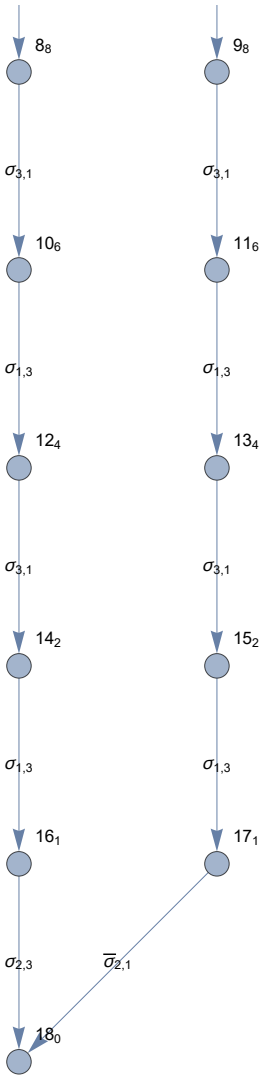
Out[•]=



In[•]:= **BR[3, {-1, 2, 2, 2, 2, 2, 2, 2, 1}] // ExtractionGraph**

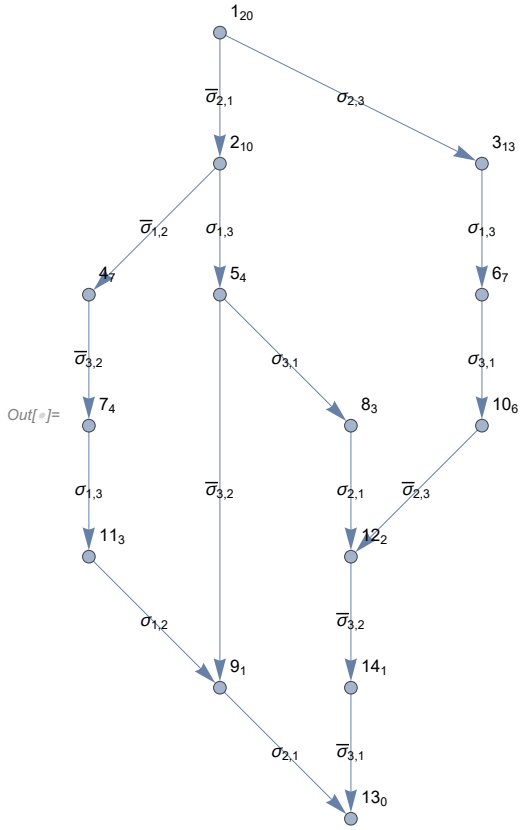


Out[•]=

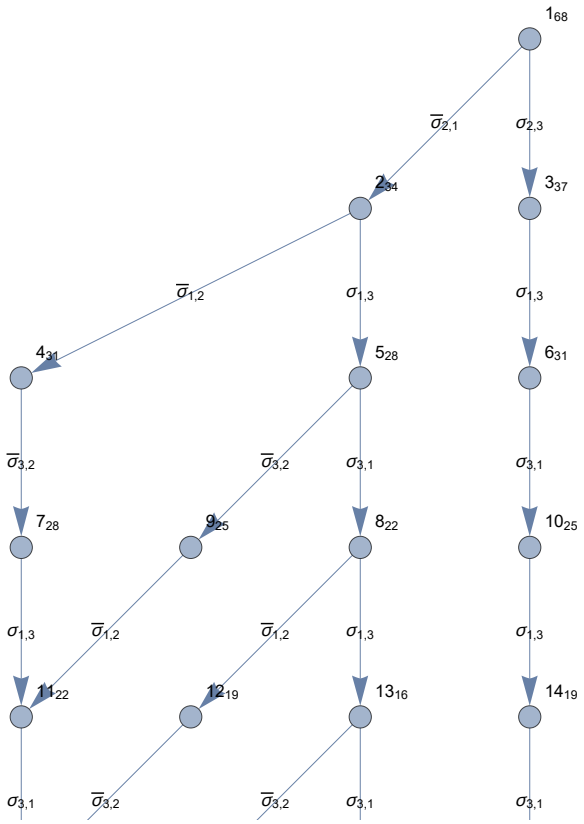


In[•]:=
```
BR[3, {-1, 2, -1, 2}] // ExtractionGraph
```

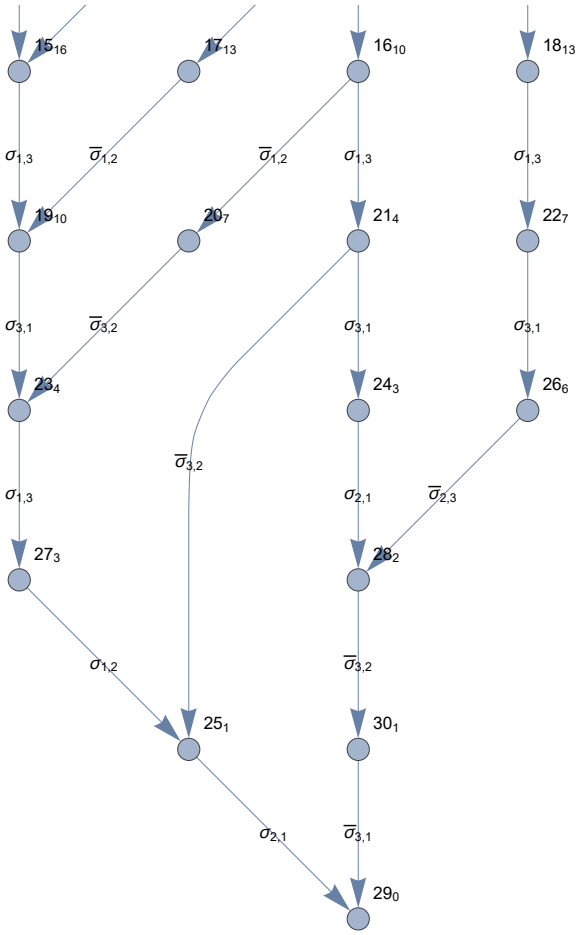
Out[•]=



In[•]:=
```
BR[3, {-1, 2, 2, 2, 2, 2, -1, 2}] // ExtractionGraph
```

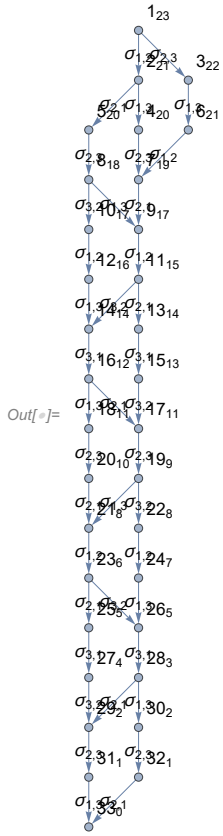


Out[•]=



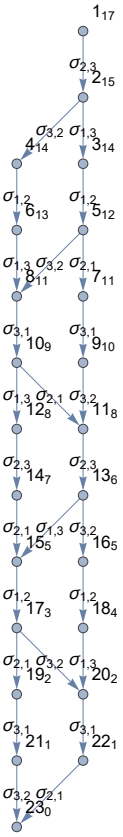
In[•]:= `BR[3, {1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2}] // ExtractionGraph`

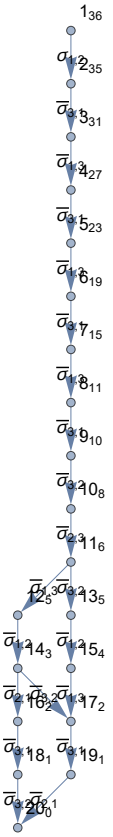
Out[•]=


1_{23}
$\sigma_{1,2}$ $\sigma_{2,3}$ 2_{21} 3_{22}
$\sigma_{2,1}$ $\sigma_{1,3}$ 4_{20} $\sigma_{1,3}$ 5_{21}
$\sigma_{2,3}$ 8_{18} $\sigma_{2,2}$ $\sigma_{1,2}$ 7_{19}
$\sigma_{3,4}$ $\sigma_{1,3}$ 10_{17} $\sigma_{2,2}$ 9_{17}
$\sigma_{1,2}$ 12_{16} $\sigma_{1,2}$ 11_{15}
$\sigma_{1,3}$ $\sigma_{2,1}$ 14_{14} $\sigma_{2,1}$ 13_{14}
$\sigma_{3,1}$ 16_{12} $\sigma_{3,1}$ 15_{13}
$\sigma_{1,3}$ $\sigma_{2,1}$ 18_{11} $\sigma_{3,2}$ 17_{11}
$\sigma_{2,2}$ 20_{10} $\sigma_{2,3}$ 19_{9}
$\sigma_{2,1}$ $\sigma_{1,3}$ 21_{8} $\sigma_{3,2}$ 22_{8}
$\sigma_{1,2}$ 23_{6} $\sigma_{1,2}$ 24_{7}
$\sigma_{2,1}$ $\sigma_{2,2}$ 25_{6} $\sigma_{1,3}$ 26_{5}
$\sigma_{3,1}$ 27_{4} $\sigma_{3,1}$ 28_{3}
$\sigma_{3,2}$ $\sigma_{1,1}$ 29_{2} $\sigma_{1,3}$ 30_{2}
$\sigma_{2,3}$ 31_{1} $\sigma_{2,3}$ 32_{1}
$\sigma_{1,3}$ $\sigma_{3,1}$ 33_{0}

In[•]:=
```
BR[3, {1, 2, 1, 1, 2, 1, 1, 2, 1, 1, 2, 1}] // ExtractionGraph
```

Out[•]=



In[•]:=
```
BR[3, {-1, -2, -1, -1, -2, -1, -1, -2, -1, 2, -1, -1, -1, -1, -1, -1, 2}] // ExtractionGraph
```

Out[•]=