

Pensieve header: Tabulating virtual braids.

```
(Alt) 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>.

```
(Alt) In[ ]:= CVD[vd_VD] := ((CVD@@vd) /. {_EOS → Sequence[], Xs_[i_, j_] := Sequence[s i, j]});
AllVPBs[n_, m_] :=
DeleteDuplicatesBy[CVD*Γ]@Flatten@Table[b, {k, 0, m}, {b, ProudVPBs[n, k]}]
```

```
(Alt) In[ ]:= AllVPBs[2, 2] /. σi,j := xm[i, j] /. σi,j → xp[i, j]
```

```
(Alt) Out[ ]:= {VPB[2], VPB[2, xp[1, 2]], VPB[2, xm[1, 2]], VPB[2, xp[2, 1]], VPB[2, xm[2, 1]],
VPB[2, xp[1, 2], xp[1, 2]], VPB[2, xp[1, 2], xp[2, 1]], VPB[2, xp[1, 2], xm[2, 1]],
VPB[2, xm[1, 2], xm[1, 2]], VPB[2, xm[1, 2], xp[2, 1]], VPB[2, xm[1, 2], xm[2, 1]],
VPB[2, xp[2, 1], xp[2, 1]], VPB[2, xp[2, 1], xp[1, 2]], VPB[2, xp[2, 1], xm[1, 2]],
VPB[2, xm[2, 1], xm[2, 1]], VPB[2, xm[2, 1], xp[1, 2]], VPB[2, xm[2, 1], xm[1, 2]]}
```

```
(Alt) In[ ]:= SaveList[n_, m_] := Module[{fname, VPBs, t, c},
fname = "Data/VPB_" <> Tostring[n] <> "_" <> Tostring[m] <> ".m";
If[FileType[fname] === File, VPBs = Get[fname]; t = "Cached",
t = First@Timing[VPBs = Select[
AllVPBs[n, m] /. σi,j := xm[i, j] /. σi,j → xp[i, j], (Length[#] == m + 1) &]];
Echo@"Saving...";
Put[VPBs, fname]
];
c = Length[VPBs];
Echo[{n, m} → {t, c}];
c
];
```

```
(Alt) In[ ]:= SaveList[3, 3]
```

```
» Saving...
» {3, 3} → {2.34375, 1416}
```

```
(Alt) Out[ ]:= 1416
```

```
(Alt) In[ ]:= 1561 - 145
```

```
(Alt) Out[ ]:= 1416
```

```
(Alt) In[ ]:= (tab = Table[SaveList[n, m], {n, 2, 6}, {m, 0, 4}]) // MatrixForm
```

```
» Saving...
» {2, 0} → {0., 1}
» Saving...
» {2, 1} → {0., 4}
» Saving...
```

» $\{2, 2\} \rightarrow \{0.015625, 12\}$
» Saving...
» $\{2, 3\} \rightarrow \{0.125, 36\}$
» Saving...
» $\{2, 4\} \rightarrow \{1.07813, 108\}$
» Saving...
» $\{3, 0\} \rightarrow \{0., 1\}$
» Saving...
» $\{3, 1\} \rightarrow \{0.015625, 12\}$
» Saving...
» $\{3, 2\} \rightarrow \{0.15625, 132\}$
» Saving...
» $\{3, 3\} \rightarrow \{3.5, 1416\}$
» Saving...
» $\{3, 4\} \rightarrow \{65.5313, 15156\}$
» Saving...
» $\{4, 0\} \rightarrow \{0., 1\}$
» Saving...
» $\{4, 1\} \rightarrow \{0.015625, 24\}$
» Saving...
» $\{4, 2\} \rightarrow \{0.875, 504\}$
» Saving...
» $\{4, 3\} \rightarrow \{18.125, 10344\}$
» Saving...
» $\{4, 4\} \rightarrow \{702.875, 211416\}$
» Saving...
» $\{5, 0\} \rightarrow \{0., 1\}$
» Saving...
» $\{5, 1\} \rightarrow \{0.015625, 40\}$
» Saving...
» $\{5, 2\} \rightarrow \{1.5, 1320\}$
» Saving...
» $\{5, 3\} \rightarrow \{64.4219, 41760\}$
» Saving...
» $\{5, 4\} \rightarrow \{3305.42, 1308360\}$
» Saving...

- » {6, 0} → {0., 1}
- » Saving...
- » {6, 1} → {0.03125, 60}
- » Saving...
- » {6, 2} → {2.90625, 2820}
- » Saving...
- » {6, 3} → {175.828, 124 140}
- » Saving...
- » {6, 4} → {13 049.8, 5 357 700}

(Alt) Out[*]//MatrixForm=

$$\begin{pmatrix} 1 & 4 & 12 & 36 & 108 \\ 1 & 12 & 132 & 1416 & 15\,156 \\ 1 & 24 & 504 & 10\,344 & 211\,416 \\ 1 & 40 & 1320 & 41\,760 & 1\,308\,360 \\ 1 & 60 & 2820 & 124\,140 & 5\,357\,700 \end{pmatrix}$$

(Alt) In[*]:=

$$\begin{pmatrix} 1 & 4 & 12 & 36 & 108 \\ 1 & 12 & 132 & 1416 & 15\,156 \\ 1 & 24 & 504 & 10\,344 & 211\,416 \\ 1 & 40 & 1320 & 41\,760 & 1\,308\,360 \\ 1 & 60 & 2820 & 124\,140 & 5\,357\,700 \end{pmatrix} // \text{Transpose} // \text{MatrixForm}$$

(Alt) Out[*]//MatrixForm=

$$\begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 4 & 12 & 24 & 40 & 60 \\ 12 & 132 & 504 & 1320 & 2820 \\ 36 & 1416 & 10\,344 & 41\,760 & 124\,140 \\ 108 & 15\,156 & 211\,416 & 1\,308\,360 & 5\,357\,700 \end{pmatrix}$$

(Alt) In[*]:= **SaveList[2, 5]**

- » Saving...
- » {2, 5} → {5.46875, 324}

(Alt) Out[*]= 324

(Alt) In[*]:= **SaveList[2, 6]**

- » Saving...
- » {2, 6} → {56.0781, 972}

(Alt) Out[*]= 972

(Alt) In[*]:= **SaveList[3, 5]**

- » Saving...
- » {3, 5} → {1208.64, 162 156}

(Alt) Out[*]= 162 156

(Alt) In[*]:= **SaveList[3, 6]**

» Saving...

» {3, 6} → {32092.8, 1734864}

(Alt) Out[*]= 1734864

(Alt) In[*]:= **SaveList**[4, 5]

» Saving...

» {4, 5} → {23725.8, 4317912}

(Alt) Out[*]= 4317912

(Alt) In[*]:= **Exit** []