```
<< KnotTheory`
```

```
Loading KnotTheory` version of February 5, 2013, 3:48:46.4762.
Read more at http://katlas.org/wiki/KnotTheory.
```

```
K = Knot[3, 1]
```

```
Knot[3, 1]
```

```
sInvariant[K]
```

SetDelayed::write : Tag Matrices in Matrices[k : Komplex[{n_, _, _}, ___]] is Protected. >>

KnotTheory::credits : Universal Khovanov homology over Q[t] is calculated using Jeremy Green's JavaKh program, interpreted by a wrapper written by Dror Bar–Natan, and decomposed into direct summands using a program of Scott Morrison and Alexander Shumakovitch.

KnotTheory::loading : Loading precomputed data in PD4Knots`.

```
pd1->PD[X[1, 4, 2, 5], X[3, 6, 4, 7], X[5, 2, 6, 3]]
```

kh-> $\frac{\text{KnotTheory`UniversalKh`Private`M[0, 1]}}{q^2} + \frac{\text{KnotTheory`UniversalKh`Private`M[0, 1]}}{q^8 t^3} + \frac{\text{KnotTheory`UniversalKh`Private`M[0, 1]}}{q^6 t^2} + \frac{\text{KnotTheory`UniversalKh`Private`h KnotTheory`UniversalKh`Private`M[1, 1, 1]}}{q^8 t^3}$

Matrices::dimsl : First argument KnotTheory`UniversalKh`Private`Komplex[{–3, KnotTheory`UniversalKh`Private`Arc[–8, 1], KnotTheory`UniversalKh`Private`H KnotTheory`UniversalKh`Private`Curtain[–8, 1, –6, 1]}, {–2, KnotTheory`UniversalKh`Private`Arc[–6, 1], 0}, {–1, 0, 0}, {0, KnotTheory`UniversalKh`Private`Arc[–2, 1], 0}] of Matrices[KnotTheory`UniversalKh`Private`Komplex[{–3, KnotTheory`UniversalKh`Private`Arc[–8, 1], KnotTheory`UniversalKh`Private`H KnotTheory`UniversalKh`Private`Curtain[–8, 1, –6, 1]}, {–2, KnotTheory`UniversalKh`Private`Arc[–6, 1], 0}, {–1, 0, 0}, {0, KnotTheory`UniversalKh`Private`Arc[–2, 1], 0}]] should be a list of positive dimensions. >>

```
KnotTheory`UniversalKh`Private`DecomposeComplex[
 {-3, {{-8}, {-6}, {}, {-2}}}, Matrices[KnotTheory`UniversalKh`Private`Komplex[
   {-3, KnotTheory`UniversalKh`Private`Arc[-8, 1], KnotTheory`UniversalKh`Private`H
     KnotTheory`UniversalKh`Private`Curtain[-8, 1, -6, 1]},
   {-2, KnotTheory`UniversalKh`Private`Arc[-6, 1], 0}, {-1, 0, 0},
   {0, KnotTheory`UniversalKh`Private`Arc[-2, 1], 0}]]]
```

```
? Matrices
```

Matrices[{d_1, d_2}] represents the domain of matrices of dimensions $d_1 \times d_2$.

Matrices[{d_1, d_2}, *dom*] represents the domain of matrices of dimensions $d_1 \times d_2$, with components in the domain *dom*.

Matrices[{d_1, d_2}, *dom*, *sym*] represents the subdomain of matrices $d_1 \times d_2$ with symmetry *sym*. >>