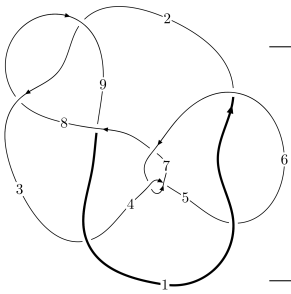
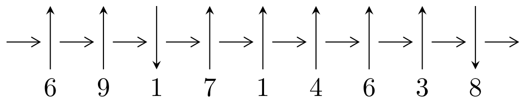
9_{45} ($K9n_2$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$4{,}6 \xrightarrow[c_6]{} 7 \xrightarrow[c_7]{} 1{,}8 \xrightarrow[c_3]{} 3 \xrightarrow[c_5]{} 5 \xrightarrow[c_9]{} 9 \xrightarrow[c_2]{} 2 \twoheadrightarrow c_1, c_4, c_8$$

Ideals for irreducible components[2] of $X_{\textbf{par}}$

$$\begin{aligned}
I_1^u = \langle & u^{11} + 2u^{10} - 5u^8 - 4u^7 + 3u^6 + 4u^5 - u^4 - u^3 + 4u^2 + b - 1, \\
& 3u^{12} + 8u^{11} + 7u^{10} - 15u^9 - 27u^8 - 8u^7 + 32u^6 + 13u^5 - 8u^4 - 8u^3 + 21u^2 + 2a - 3u - 7, \\
& u^{13} + 3u^{12} + 3u^{11} - 4u^{10} - 10u^9 - 5u^8 + 8u^7 + 7u^6 - u^5 - 2u^4 + 5u^3 + 2u^2 - 2u - 1\rangle \\
I_2^u = \langle & b,\ a^2 - a + 1,\ u - 1\rangle
\end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 15 representations.

[1] The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

[2] All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I.

$$\boldsymbol{I_1^u = \langle u^{11}+2u^{10}+\cdots+b-1,\ 3u^{12}+8u^{11}+\cdots+2a-7,\ u^{13}+3u^{12}+\cdots-2u-1\rangle}$$

(i) Arc colorings

$$a_4 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-\frac{3}{2}u^{12}-4u^{11}+\cdots+\frac{3}{2}u+\frac{7}{2}\\-u^{11}-2u^{10}+5u^8+4u^7-3u^6-4u^5+u^4+u^3-4u^2+1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u^2+1\\-u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}\frac{1}{2}u^{12}+u^{11}+\cdots-\frac{5}{2}u+\frac{1}{2}\\u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-\frac{7}{2}u^{12}-8u^{11}+\cdots+\frac{7}{2}u+\frac{11}{2}\\-\frac{1}{2}u^{12}-u^{11}+\cdots+\frac{1}{2}u+\frac{1}{2}\end{pmatrix}$$
$$a_2 = \begin{pmatrix}\frac{3}{2}u^{12}+5u^{11}+\cdots-\frac{3}{2}u-\frac{9}{2}\\u^{11}+2u^{10}-5u^8-4u^7+3u^6+4u^5-u^4-u^3+4u^2-1\end{pmatrix}$$
$$a_2 = \begin{pmatrix}\frac{3}{2}u^{12}+5u^{11}+\cdots-\frac{3}{2}u-\frac{9}{2}\\u^{11}+2u^{10}-5u^8-4u^7+3u^6+4u^5-u^4-u^3+4u^2-1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -2u^{12}-3u^{11}+u^{10}+14u^9+9u^8-10u^7-26u^6+4u^5+13u^4+5u^3-15u^2+8u+9$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{13} + u^{12} + \cdots + 4u - 4$
c_2, c_8	$u^{13} + 2u^{12} + \cdots + u - 1$
c_3	$u^{13} - 2u^{12} + \cdots + 3u - 1$
c_4, c_6	$u^{13} + 3u^{12} + \cdots - 2u - 1$
c_7	$u^{13} - 3u^{12} + \cdots + 8u - 1$
c_9	$u^{13} + 8u^{12} + \cdots + 5u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^{13} + 15y^{12} + \cdots - 56y - 16$
c_2, c_8	$y^{13} + 8y^{12} + \cdots + 5y - 1$
c_3	$y^{13} - 16y^{12} + \cdots + 5y - 1$
c_4, c_6	$y^{13} - 3y^{12} + \cdots + 8y - 1$
c_7	$y^{13} + 17y^{12} + \cdots + 8y - 1$
c_9	$y^{13} - 4y^{12} + \cdots + 85y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.139730 + 0.201820I$ $a = 0.107110 - 0.295303I$ $b = -0.452299 + 0.637242I$	$0.965349 + 0.999086I$	$3.54362 + 0.58191I$
$u = 1.139730 - 0.201820I$ $a = 0.107110 + 0.295303I$ $b = -0.452299 - 0.637242I$	$0.965349 - 0.999086I$	$3.54362 - 0.58191I$
$u = 0.431606 + 0.658497I$ $a = -0.349504 + 0.760906I$ $b = 0.997974 + 0.288600I$	$-1.60812 + 2.52293I$	$1.64572 - 4.38707I$
$u = 0.431606 - 0.658497I$ $a = -0.349504 - 0.760906I$ $b = 0.997974 - 0.288600I$	$-1.60812 - 2.52293I$	$1.64572 + 4.38707I$
$u = -0.946506 + 0.889214I$ $a = 0.759526 + 1.128230I$ $b = -0.25689 + 1.55234I$	$-4.36446 - 3.30324I$	$4.83610 + 2.39821I$
$u = -0.946506 - 0.889214I$ $a = 0.759526 - 1.128230I$ $b = -0.25689 - 1.55234I$	$-4.36446 + 3.30324I$	$4.83610 - 2.39821I$
$u = 0.650994$ $a = 0.569843$ $b = -0.612460$	1.00303	10.1180
$u = -0.831561 + 1.070510I$ $a = -0.593619 - 1.044890I$ $b = -0.02169 - 1.76519I$	$-8.78028 + 1.38297I$	$1.065751 - 0.716223I$
$u = -0.831561 - 1.070510I$ $a = -0.593619 + 1.044890I$ $b = -0.02169 + 1.76519I$	$-8.78028 - 1.38297I$	$1.065751 + 0.716223I$
$u = -1.10810 + 0.91291I$ $a = -0.854060 - 1.005570I$ $b = 0.50699 - 1.66583I$	$-7.87584 - 8.60203I$	$2.41458 + 5.32797I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.10810 - 0.91291I$ $a = -0.854060 + 1.005570I$ $b = 0.50699 + 1.66583I$	$-7.87584 + 8.60203I$	$2.41458 - 5.32797I$
$u = -0.510670 + 0.169591I$ $a = 0.14563 + 2.33106I$ $b = 0.032142 + 0.650070I$	$0.60016 - 2.36301I$	$1.43513 + 4.19898I$
$u = -0.510670 - 0.169591I$ $a = 0.14563 - 2.33106I$ $b = 0.032142 - 0.650070I$	$0.60016 + 2.36301I$	$1.43513 - 4.19898I$

II. $I_2^u = \langle b,\ a^2 - a + 1,\ u - 1 \rangle$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} a \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} a-1 \\ 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a \\ -a \end{pmatrix}$$
$$a_2 = \begin{pmatrix} a \\ 0 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} a \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4a + 7$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	u^2
c_2	$u^2 - u + 1$
c_3, c_8, c_9	$u^2 + u + 1$
c_4	$(u+1)^2$
c_6, c_7	$(u-1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	y^2
c_2, c_3, c_8 c_9	$y^2 + y + 1$
c_4, c_6, c_7	$(y-1)^2$

(vi) Complex Volumes and Cusp Shapes

	Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	1.00000		
$a =$	$0.500000 + 0.866025I$	$1.64493 - 2.02988I$	$9.00000 + 3.46410I$
$b =$	0		
$u =$	1.00000		
$a =$	$0.500000 - 0.866025I$	$1.64493 + 2.02988I$	$9.00000 - 3.46410I$
$b =$	0		

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^2(u^{13} + u^{12} + \cdots + 4u - 4)$
c_2	$(u^2 - u + 1)(u^{13} + 2u^{12} + \cdots + u - 1)$
c_3	$(u^2 + u + 1)(u^{13} - 2u^{12} + \cdots + 3u - 1)$
c_4	$((u + 1)^2)(u^{13} + 3u^{12} + \cdots - 2u - 1)$
c_6	$((u - 1)^2)(u^{13} + 3u^{12} + \cdots - 2u - 1)$
c_7	$((u - 1)^2)(u^{13} - 3u^{12} + \cdots + 8u - 1)$
c_8	$(u^2 + u + 1)(u^{13} + 2u^{12} + \cdots + u - 1)$
c_9	$(u^2 + u + 1)(u^{13} + 8u^{12} + \cdots + 5u - 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^2(y^{13} + 15y^{12} + \cdots - 56y - 16)$
c_2, c_8	$(y^2 + y + 1)(y^{13} + 8y^{12} + \cdots + 5y - 1)$
c_3	$(y^2 + y + 1)(y^{13} - 16y^{12} + \cdots + 5y - 1)$
c_4, c_6	$((y - 1)^2)(y^{13} - 3y^{12} + \cdots + 8y - 1)$
c_7	$((y - 1)^2)(y^{13} + 17y^{12} + \cdots + 8y - 1)$
c_9	$(y^2 + y + 1)(y^{13} - 4y^{12} + \cdots + 85y - 1)$