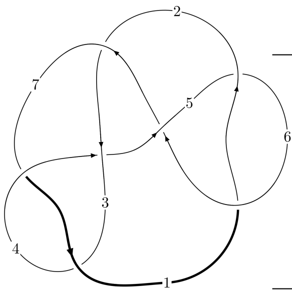
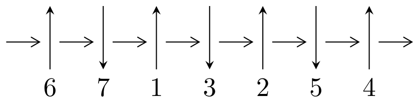
7_7 ($K7a_1$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^4 + u^2 - u + 1 \rangle$$
$$I_2^u = \langle u^6 + u^5 + 2u^4 + 2u^3 + 2u^2 + 2u + 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 10 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. $\boldsymbol{I_1^u = \langle u^4 + u^2 - u + 1 \rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^2 + 1 \\ -u^2 + u - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u \\ u^2 - u + 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1 \\ u^3 + 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1 \\ u^3 + 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^3 - 4u^2 + 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_5 c_7	$u^4 + u^2 - u + 1$
c_2	$u^4 - 3u^3 + 4u^2 - 3u + 2$
c_4, c_6	$u^4 + 2u^3 + 3u^2 + u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_5 c_7	$y^4 + 2y^3 + 3y^2 + y + 1$
c_2	$y^4 - y^3 + 2y^2 + 7y + 4$
c_4, c_6	$y^4 + 2y^3 + 7y^2 + 5y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.547424 + 0.585652I$	$0.98010 + 1.39709I$	$3.77019 - 3.86736I$
$u = 0.547424 - 0.585652I$	$0.98010 - 1.39709I$	$3.77019 + 3.86736I$
$u = -0.547424 + 1.120870I$	$-2.62503 - 7.64338I$	$-1.77019 + 6.51087I$
$u = -0.547424 - 1.120870I$	$-2.62503 + 7.64338I$	$-1.77019 - 6.51087I$

II. $I_2^u = \langle u^6 + u^5 + 2u^4 + 2u^3 + 2u^2 + 2u + 1 \rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^2 + 1 \\ u^4 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^4 + u^2 + 1 \\ -u^4 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^5 + 2u^3 + u + 1 \\ u^5 + u^3 + u^2 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^5 + 2u^3 + u + 1 \\ u^5 + u^3 + u^2 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^3 - 4u - 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_5 c_7	$u^6 + u^5 + 2u^4 + 2u^3 + 2u^2 + 2u + 1$
c_2	$(u^3 + u^2 - 1)^2$
c_4, c_6	$u^6 + 3u^5 + 4u^4 + 2u^3 + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_5 c_7	$y^6 + 3y^5 + 4y^4 + 2y^3 + 1$
c_2	$(y^3 - y^2 + 2y - 1)^2$
c_4, c_6	$y^6 - y^5 + 4y^4 - 2y^3 + 8y^2 + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.498832 + 1.001300I$	$-0.26574 + 2.82812I$	$1.50976 - 2.97945I$
$u = \quad 0.498832 - 1.001300I$	$-0.26574 - 2.82812I$	$1.50976 + 2.97945I$
$u = -0.284920 + 1.115140I$	-4.40332	$-5.01951 + 0.I$
$u = -0.284920 - 1.115140I$	-4.40332	$-5.01951 + 0.I$
$u = -0.713912 + 0.305839I$	$-0.26574 + 2.82812I$	$1.50976 - 2.97945I$
$u = -0.713912 - 0.305839I$	$-0.26574 - 2.82812I$	$1.50976 + 2.97945I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_5 c_7	$(u^4+u^2-u+1)(u^6+u^5+2u^4+2u^3+2u^2+2u+1)$
c_2	$(u^3+u^2-1)^2(u^4-3u^3+4u^2-3u+2)$
c_4, c_6	$(u^4+2u^3+3u^2+u+1)(u^6+3u^5+4u^4+2u^3+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_5 c_7	$(y^4 + 2y^3 + 3y^2 + y + 1)(y^6 + 3y^5 + 4y^4 + 2y^3 + 1)$
c_2	$(y^3 - y^2 + 2y - 1)^2(y^4 - y^3 + 2y^2 + 7y + 4)$
c_4, c_6	$(y^4 + 2y^3 + 7y^2 + 5y + 1)(y^6 - y^5 + 4y^4 - 2y^3 + 8y^2 + 1)$