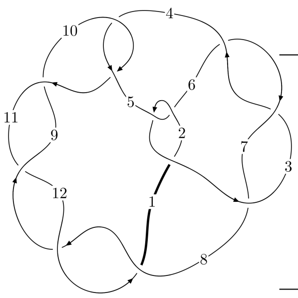
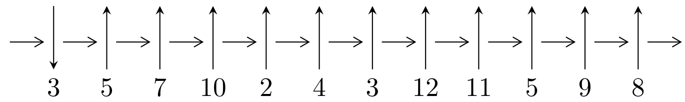
$12n_{0332}$ $(K12n_{0332})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$5,11 \xrightarrow[c_{10}]{} 10 \xrightarrow[c_4]{} 4,7 \xrightarrow[c_3]{} 3 \xrightarrow[c_2]{} 2 \xrightarrow[c_1]{} 1 \xrightarrow[c_6]{} 6 \xrightarrow[c_9]{} 9 \xrightarrow[c_{11}]{} 12 \xrightarrow[c_8]{} 8 \twoheadrightarrow c_5, c_7, c_{12}$$

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

$$\begin{aligned}
I_1^u &= \langle u^8 - u^7 - u^6 + 3u^5 - u^4 - u^3 + u^2 + b + u - 1,\ -u^9 + u^8 + u^7 - 3u^6 + u^5 + u^4 - 2u^3 + 2a + u - 1, \\
&\quad u^{10} - 3u^9 + 3u^8 + 3u^7 - 9u^6 + 7u^5 + 2u^4 - 4u^3 - u^2 + 5u - 2\rangle \\
I_2^u &= \langle u^7 - u^5 + 3u^3 + u^2 + b - u,\ -u^7 + u^6 + u^5 - u^4 - 3u^3 + 2u^2 + a + 2u - 1,\ u^8 - u^6 + 3u^4 - 2u^2 + 1\rangle \\
I_3^u &= \langle b^2 + b + 2,\ a - 1,\ u + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 20 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. $I_1^u = \langle u^8 - u^7 - u^6 + 3u^5 - u^4 - u^3 + u^2 + b + u - 1,\ -u^9 + u^8 + \cdots + 2a - 1,\ u^{10} - 3u^9 + \cdots + 5u - 2\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^9 - 10u^8 + 6u^7 + 18u^6 - 30u^5 + 10u^4 + 20u^3 - 12u^2 - 10u + 22$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{10}-10u^9+\cdots+2u+1$
c_2,c_3,c_5 c_6,c_7	$u^{10}+2u^9-3u^8-6u^7+8u^6+26u^5-12u^4+22u^3-9u^2+4u-1$
c_4,c_{10}	$u^{10}-3u^9+3u^8+3u^7-9u^6+7u^5+2u^4-4u^3-u^2+5u-2$
c_8,c_9,c_{11} c_{12}	$u^{10}-3u^9+\cdots-21u+4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{10} - 2y^9 + \cdots - 146y + 1$
c_2, c_3, c_5 c_6, c_7	$y^{10} - 10y^9 + \cdots + 2y + 1$
c_4, c_{10}	$y^{10} - 3y^9 + \cdots - 21y + 4$
c_8, c_9, c_{11} c_{12}	$y^{10} + 9y^9 + \cdots - 177y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.578093 + 0.999236I$ $a = 0.42866 - 1.39259I$ $b = 0.90785 + 1.25726I$	$1.59788 - 2.80907I$	$5.86935 + 0.88784I$
$u = 0.578093 - 0.999236I$ $a = 0.42866 + 1.39259I$ $b = 0.90785 - 1.25726I$	$1.59788 + 2.80907I$	$5.86935 - 0.88784I$
$u = -0.702617 + 0.466190I$ $a = 0.287658 + 0.593730I$ $b = -0.219312 - 0.226300I$	$-1.04423 - 1.80881I$	$6.53522 + 6.24906I$
$u = -0.702617 - 0.466190I$ $a = 0.287658 - 0.593730I$ $b = -0.219312 + 0.226300I$	$-1.04423 + 1.80881I$	$6.53522 - 6.24906I$
$u = 0.916845 + 0.866673I$ $a = -0.785318 + 0.843397I$ $b = -0.26510 - 1.64874I$	$-8.72520 + 3.21048I$	$7.41352 - 2.75592I$
$u = 0.916845 - 0.866673I$ $a = -0.785318 - 0.843397I$ $b = -0.26510 + 1.64874I$	$-8.72520 - 3.21048I$	$7.41352 + 2.75592I$
$u = 1.144580 + 0.768721I$ $a = 1.275550 - 0.486093I$ $b = -0.96622 + 2.20358I$	$3.33426 + 9.25636I$	$6.94023 - 4.73549I$
$u = 1.144580 - 0.768721I$ $a = 1.275550 + 0.486093I$ $b = -0.96622 - 2.20358I$	$3.33426 - 9.25636I$	$6.94023 + 4.73549I$
$u = -1.37948$ $a = -1.26013$ $b = 0.730548$	9.04363	10.0430
$u = 0.505678$ $a = 0.347038$ $b = 0.355011$	0.630953	16.4400

II. $\boldsymbol{I_2^u = \langle u^7 - u^5 + 3u^3 + u^2 + b - u,\ -u^7 + u^6 + u^5 - u^4 - 3u^3 + 2u^2 + a + 2u - 1,\ u^8 - u^6 + 3u^4 - 2u^2 + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^6 + 4u^4 - 12u^2 + 8$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u-1)^8$
c_2, c_3, c_5 c_6, c_7	$(u^2+1)^4$
c_4, c_{10}	$u^8 - u^6 + 3u^4 - 2u^2 + 1$
c_8, c_9	$(u^4 + u^3 + 3u^2 + 2u + 1)^2$
c_{11}, c_{12}	$(u^4 - u^3 + 3u^2 - 2u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)^8$
c_2, c_3, c_5 c_6, c_7	$(y+1)^8$
c_4, c_{10}	$(y^4 - y^3 + 3y^2 - 2y + 1)^2$
c_8, c_9, c_{11} c_{12}	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.720342 + 0.351808I$ $a = -0.769066 - 0.172918I$ $b = 0.005408 - 1.406080I$	$-3.07886 + 1.41510I$	$3.82674 - 4.90874I$
$u = 0.720342 - 0.351808I$ $a = -0.769066 + 0.172918I$ $b = 0.005408 + 1.406080I$	$-3.07886 - 1.41510I$	$3.82674 + 4.90874I$
$u = -0.720342 + 0.351808I$ $a = 1.47268 + 1.26777I$ $b = -0.795655 - 0.392388I$	$-3.07886 - 1.41510I$	$3.82674 + 4.90874I$
$u = -0.720342 - 0.351808I$ $a = 1.47268 - 1.26777I$ $b = -0.795655 + 0.392388I$	$-3.07886 + 1.41510I$	$3.82674 - 4.90874I$
$u = 0.911292 + 0.851808I$ $a = -1.43746 + 1.45872I$ $b = -0.43052 - 2.95172I$	$-10.08060 + 3.16396I$	$0.17326 - 2.56480I$
$u = 0.911292 - 0.851808I$ $a = -1.43746 - 1.45872I$ $b = -0.43052 + 2.95172I$	$-10.08060 - 3.16396I$	$0.17326 + 2.56480I$
$u = -0.911292 + 0.851808I$ $a = -0.266156 - 0.363868I$ $b = 0.220764 + 0.153260I$	$-10.08060 - 3.16396I$	$0.17326 + 2.56480I$
$u = -0.911292 - 0.851808I$ $a = -0.266156 + 0.363868I$ $b = 0.220764 - 0.153260I$	$-10.08060 + 3.16396I$	$0.17326 - 2.56480I$

III. $I_3^u = \langle b^2 + b + 2,\ a - 1,\ u + 1 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ b \end{pmatrix}$$
$$a_3 = \begin{pmatrix} b+1 \\ -b-2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} b+1 \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -b+1 \\ b \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	u^2+3u+4
c_2, c_3, c_5 c_6, c_7	u^2-u+2
c_4, c_{10}	$(u+1)^2$
c_8, c_9, c_{11} c_{12}	$(u-1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^2 - y + 16$
c_2, c_3, c_5 c_6, c_7	$y^2 + 3y + 4$
c_4, c_8, c_9 c_{10}, c_{11}, c_{12}	$(y-1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = \quad 1.00000$ $b = -0.50000 + 1.32288I$	-1.64493	10.0000
$u = -1.00000$ $a = \quad 1.00000$ $b = -0.50000 - 1.32288I$	-1.64493	10.0000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^8)(u^2+3u+4)(u^{10}-10u^9+\cdots+2u+1)$
c_2, c_3, c_5 c_6, c_7	$(u^2+1)^4(u^2-u+2)$ $\cdot\,(u^{10}+2u^9-3u^8-6u^7+8u^6+26u^5-12u^4+22u^3-9u^2+4u-1)$
c_4, c_{10}	$(u+1)^2(u^8-u^6+3u^4-2u^2+1)$ $\cdot\,(u^{10}-3u^9+3u^8+3u^7-9u^6+7u^5+2u^4-4u^3-u^2+5u-2)$
c_8, c_9	$((u-1)^2)(u^4+u^3+3u^2+2u+1)^2(u^{10}-3u^9+\cdots-21u+4)$
c_{11}, c_{12}	$((u-1)^2)(u^4-u^3+3u^2-2u+1)^2(u^{10}-3u^9+\cdots-21u+4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^8)(y^2-y+16)(y^{10}-2y^9+\cdots-146y+1)$
c_2, c_3, c_5 c_6, c_7	$((y+1)^8)(y^2+3y+4)(y^{10}-10y^9+\cdots+2y+1)$
c_4, c_{10}	$((y-1)^2)(y^4-y^3+3y^2-2y+1)^2(y^{10}-3y^9+\cdots-21y+4)$
c_8, c_9, c_{11} c_{12}	$((y-1)^2)(y^4+5y^3+\cdots+2y+1)^2(y^{10}+9y^9+\cdots-177y+16)$