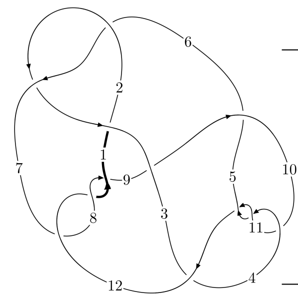
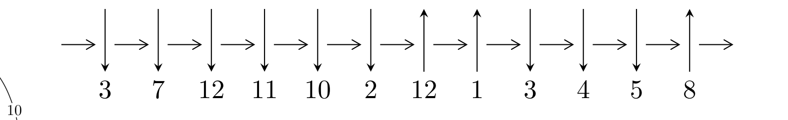
$12n_{0577}$ ($K12n_{0577}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u &= \langle u^{18} + 3u^{17} + \cdots + 4b + 4,\ 2u^{18} + 3u^{17} + \cdots + 4a - 2,\ u^{19} + 2u^{18} + \cdots - 2u + 2\rangle \\
I_2^u &= \langle u^3 - 3u^2 + b - 2u + 2,\ 2u^3 - 3u^2 + 3a - 3u,\ u^4 - 3u^2 + 3\rangle \\
I_3^u &= \langle u^3 + u^2 + b,\ -u^2 + a + u + 2,\ u^4 - u^2 - 1\rangle \\
I_4^u &= \langle -a^2 + b + a + 2,\ a^3 - 2a^2 - 3a - 1,\ u - 1\rangle
\end{aligned}
$$

$$
I_1^v = \langle a,\ b - 1,\ v - 1\rangle
$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 31 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.

$$I^u_1 = \langle u^{18}+3u^{17}+\cdots+4b+4,\ 2u^{18}+3u^{17}+\cdots+4a-2,\ u^{19}+2u^{18}+\cdots-2u+2\rangle$$

(i) Arc colorings

$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-\frac{1}{2}u^{18}-\frac{3}{4}u^{17}+\cdots+u+\frac{1}{2}\\-\frac{1}{4}u^{18}-\frac{3}{4}u^{17}+\cdots+\frac{3}{2}u-1\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}\frac{1}{2}u^{18}-\frac{13}{4}u^{16}+\cdots-\frac{1}{2}u+\frac{3}{2}\\\frac{3}{2}u^{18}+\frac{3}{2}u^{17}+\cdots-3u+2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^3+2u\\-u^5+u^3+u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-\frac{1}{4}u^{17}+\frac{3}{2}u^{15}+\cdots+u+1\\-\frac{1}{4}u^{17}+\frac{3}{2}u^{15}+\cdots-\frac{3}{2}u^2-\frac{1}{2}u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}\frac{1}{2}u^{12}-\frac{5}{2}u^{10}+\cdots+\frac{3}{2}u+1\\\frac{1}{4}u^{17}-\frac{3}{2}u^{15}+\cdots+\frac{3}{2}u^2+\frac{1}{2}u\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u^5-2u^3+u\\u^5-u^3-u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u^2+1\\-u^2\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u^{10}-5u^8+8u^6-3u^4-3u^2+1\\u^{12}-4u^{10}+4u^8+2u^6-3u^4-2u^2\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -2u^{18}+14u^{16}+2u^{15}-40u^{14}-12u^{13}+46u^{12}+28u^{11}+18u^{10}-26u^9-98u^8-4u^7+64u^6+22u^5+36u^4-12u^3-38u^2+8u-12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{19} - 4u^{18} + \cdots + 1887u + 49$
c_2, c_6	$u^{19} - 2u^{18} + \cdots - 37u - 7$
c_3, c_5	$u^{19} - 3u^{18} + \cdots - 122u - 46$
c_4, c_{10}, c_{11}	$u^{19} - 2u^{18} + \cdots - 2u - 2$
c_7, c_8, c_{12}	$u^{19} + 2u^{18} + \cdots + 63u - 7$
c_9	$u^{19} - 4u^{18} + \cdots + 13446u - 5482$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{19} + 64y^{18} + \cdots + 3231195y - 2401$
c_2, c_6	$y^{19} + 4y^{18} + \cdots + 1887y - 49$
c_3, c_5	$y^{19} + 35y^{18} + \cdots + 9456y - 2116$
c_4, c_{10}, c_{11}	$y^{19} - 14y^{18} + \cdots + 8y - 4$
c_7, c_8, c_{12}	$y^{19} - 36y^{18} + \cdots + 6895y - 49$
c_9	$y^{19} + 110y^{18} + \cdots - 1950902712y - 30052324$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.057514+0.997076I$ $a=\ \ 4.41674+0.12405I$ $b=-2.30270-0.31667I$	$-19.3196+4.9982I$	$-1.30896-2.07714I$
$u=-0.057514-0.997076I$ $a=\ \ 4.41674-0.12405I$ $b=-2.30270+0.31667I$	$-19.3196-4.9982I$	$-1.30896+2.07714I$
$u=-0.142968+0.865479I$ $a=-3.01025+1.29423I$ $b=\ \ 1.029780+0.322487I$	$7.61295+0.58148I$	$-0.023432-0.755964I$
$u=-0.142968-0.865479I$ $a=-3.01025-1.29423I$ $b=\ \ 1.029780-0.322487I$	$7.61295-0.58148I$	$-0.023432+0.755964I$
$u=\ \ 1.24695$ $a=-0.418171$ $b=-1.55733$	-2.34368	-4.04380
$u=-1.223500+0.244957I$ $a=-0.177243+0.379170I$ $b=-0.340423+0.077135I$	$-2.81621+4.28308I$	$-9.76275-6.60090I$
$u=-1.223500-0.244957I$ $a=-0.177243-0.379170I$ $b=-0.340423-0.077135I$	$-2.81621-4.28308I$	$-9.76275+6.60090I$
$u=-1.178360+0.467565I$ $a=\ \ 2.39170-0.15913I$ $b=\ \ 3.99920-2.07726I$	$4.46238+4.21258I$	$-3.28610-3.54866I$
$u=-1.178360-0.467565I$ $a=\ \ 2.39170+0.15913I$ $b=\ \ 3.99920+2.07726I$	$4.46238-4.21258I$	$-3.28610+3.54866I$
$u=-1.28379$ $a=-1.10593$ $b=-1.73530$	-5.57169	-16.6430

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.282330 + 0.529998I$ $a = -2.87135 + 1.25440I$ $b = -4.30847 + 5.80802I$	$16.3839 + 0.4170I$	$-3.95888 - 0.90643I$
$u = -1.282330 - 0.529998I$ $a = -2.87135 - 1.25440I$ $b = -4.30847 - 5.80802I$	$16.3839 - 0.4170I$	$-3.95888 + 0.90643I$
$u = 1.358030 + 0.344537I$ $a = 1.32857 + 1.36569I$ $b = 2.46464 + 3.90915I$	$2.84646 - 4.89611I$	$-3.78070 + 3.50098I$
$u = 1.358030 - 0.344537I$ $a = 1.32857 - 1.36569I$ $b = 2.46464 - 3.90915I$	$2.84646 + 4.89611I$	$-3.78070 - 3.50098I$
$u = 1.35479 + 0.47305I$ $a = -2.92129 - 1.22251I$ $b = -5.11425 - 5.33647I$	$15.7390 - 10.2337I$	$-4.55408 + 4.64263I$
$u = 1.35479 - 0.47305I$ $a = -2.92129 + 1.22251I$ $b = -5.11425 + 5.33647I$	$15.7390 + 10.2337I$	$-4.55408 - 4.64263I$
$u = 0.021436 + 0.497066I$ $a = 0.993630 - 0.078348I$ $b = 0.348156 - 0.347395I$	$0.87785 - 1.46275I$	$-1.25478 + 5.25309I$
$u = 0.021436 - 0.497066I$ $a = 0.993630 + 0.078348I$ $b = 0.348156 + 0.347395I$	$0.87785 + 1.46275I$	$-1.25478 - 5.25309I$
$u = 0.337682$ $a = 1.22310$ $b = -0.259248$	-0.889902	-13.4540

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

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{2}{3}u^3 + u^2 + u \\ -u^3 + 3u^2 + 2u - 2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{2}{3}u^3 - u^2 - u + 1 \\ u^3 - 2u^2 - 2u + 2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^3 + 2u \\ -2u^3 + 4u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{2}{3}u^3 + u^2 + u - 1 \\ -u^3 + 2u^2 + 2u - 2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{1}{3}u^3 - u^2 + u + 1 \\ -u^3 - 2u^2 + 2u + 2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^3 + 2u \\ -2u^3 + 4u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.271230 + 0.340625I$ $a = 1.69666 + 0.13208I$ $b = 3.43060 + 1.66747I$	$-4.05977I$	$-6.00000 + 3.46410I$
$u = 1.271230 - 0.340625I$ $a = 1.69666 - 0.13208I$ $b = 3.43060 - 1.66747I$	$4.05977I$	$-6.00000 - 3.46410I$
$u = -1.271230 + 0.340625I$ $a = 1.30334 - 1.59997I$ $b = 1.56940 - 3.52868I$	$4.05977I$	$-6.00000 - 3.46410I$
$u = -1.271230 - 0.340625I$ $a = 1.30334 + 1.59997I$ $b = 1.56940 + 3.52868I$	$-4.05977I$	$-6.00000 + 3.46410I$

III. $\boldsymbol{I_3^u = \langle u^3 + u^2 + b,\ -u^2 + a + u + 2,\ u^4 - u^2 - 1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^2 - u - 2 \\ -u^3 - u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^2 - u - 1 \\ -u^3 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^3 + 2u \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^2 - u - 1 \\ -u^3 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^3 + u^2 + u - 1 \\ -u^3 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^3 - 2u \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -1 \\ -u^2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.786151I$ $a = -2.61803 - 0.78615I$ $b = 0.618034 + 0.485868I$	3.94784	−1.52790
$u = -0.786151I$ $a = -2.61803 + 0.78615I$ $b = 0.618034 - 0.485868I$	3.94784	−1.52790
$u = 1.27202$ $a = -1.65399$ $b = -3.67621$	−3.94784	−10.4720
$u = -1.27202$ $a = 0.890054$ $b = 0.440137$	−3.94784	−10.4720

IV. $\boldsymbol{I_4^u = \langle -a^2 + b + a + 2,\ a^3 - 2a^2 - 3a - 1,\ u - 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 1.00000$ $a = -0.539798 + 0.182582I$ $b = -1.202160 - 0.379697I$	-1.64493	-6.00000
$u = \quad 1.00000$ $a = -0.539798 - 0.182582I$ $b = -1.202160 + 0.379697I$	-1.64493	-6.00000
$u = \quad 1.00000$ $a = \quad 3.07960$ $b = \quad 4.40431$	-1.64493	-6.00000

V. $\boldsymbol{I_1^v = \langle a,\ b-1,\ v-1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_8 = \begin{pmatrix}0\\1\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_1 = \begin{pmatrix}1\\-1\end{pmatrix}$$

$$a_4 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_7 = \begin{pmatrix}-1\\1\end{pmatrix}$$

$$a_2 = \begin{pmatrix}2\\-1\end{pmatrix}$$

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_9 = \begin{pmatrix}1\\0\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_7, c_8, c_{12}	$y - 1$
c_3, c_4, c_5 c_9, c_{10}, c_{11}	y

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v =$	1.00000		
$a =$	0	0	0
$b =$	1.00000		

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^9)(u^3+2u^2+u+1)(u^{19}-4u^{18}+\cdots+1887u+49)$
c_2	$((u-1)^5)(u+1)^4(u^3-u-1)(u^{19}-2u^{18}+\cdots-37u-7)$
c_3, c_5	$u^4(u^4+u^2-1)(u^4+3u^2+3)(u^{19}-3u^{18}+\cdots-122u-46)$
c_4, c_{10}, c_{11}	$u(u+1)^3(u^4-3u^2+3)(u^4-u^2-1)(u^{19}-2u^{18}+\cdots-2u-2)$
c_6	$((u-1)^4)(u+1)^5(u^3-u-1)(u^{19}-2u^{18}+\cdots-37u-7)$
c_7, c_8	$((u-1)^4)(u+1)^5(u^3-u-1)(u^{19}+2u^{18}+\cdots+63u-7)$
c_9	$u(u+1)^3(u^4+u^2-1)(u^4+3u^2+3)(u^{19}-4u^{18}+\cdots+13446u-5482)$
c_{12}	$((u-1)^5)(u+1)^4(u^3-u-1)(u^{19}+2u^{18}+\cdots+63u-7)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^3-2y^2-3y-1)(y^{19}+64y^{18}+\cdots+3231195y-2401)$
c_2, c_6	$((y-1)^9)(y^3-2y^2+y-1)(y^{19}+4y^{18}+\cdots+1887y-49)$
c_3, c_5	$y^4(y^2+y-1)^2(y^2+3y+3)^2(y^{19}+35y^{18}+\cdots+9456y-2116)$
c_4, c_{10}, c_{11}	$y(y-1)^3(y^2-3y+3)^2(y^2-y-1)^2(y^{19}-14y^{18}+\cdots+8y-4)$
c_7, c_8, c_{12}	$((y-1)^9)(y^3-2y^2+y-1)(y^{19}-36y^{18}+\cdots+6895y-49)$
c_9	$y(y-1)^3(y^2+y-1)^2(y^2+3y+3)^2$ $\cdot\,(y^{19}+110y^{18}+\cdots-1950902712y-30052324)$