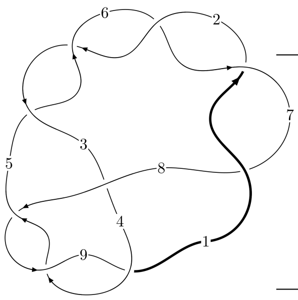
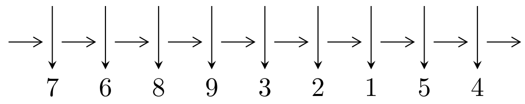
## $9_5$ $(K9a_{36})$




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$I_1^u = \langle u^{11} - u^{10} + 6u^9 - 5u^8 + 12u^7 - 8u^6 + 8u^5 - 3u^4 + u^3 + u^2 + 2u - 1\rangle$$

* 1 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 11 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.** $\boldsymbol{I_1^u = \langle u^{11} - u^{10} + 6u^9 - 5u^8 + 12u^7 - 8u^6 + 8u^5 - 3u^4 + u^3 + u^2 + 2u - 1\rangle}$

**(i) Arc colorings**

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

**(ii) Obstruction class** $= -1$

**(iii) Cusp Shapes**
$= -4u^{10} + 4u^9 - 24u^8 + 16u^7 - 44u^6 + 16u^5 - 20u^4 - 4u^3 + 4u^2 - 4u - 14$

**(iv) u-Polynomials at the component**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_2, c_5$<br>$c_6, c_7$ | $u^{11} - u^{10} + 8u^9 - 7u^8 + 22u^7 - 16u^6 + 24u^5 - 13u^4 + 9u^3 - 3u^2 + 1$ |
| $c_3$ | $u^{11} - u^{10} + 4u^9 - u^8 + 18u^7 - 2u^6 + 26u^5 - 3u^4 + 23u^3 - u^2 + 4u + 5$ |
| $c_4, c_8, c_9$ | $u^{11} + u^{10} + 6u^9 + 5u^8 + 12u^7 + 8u^6 + 8u^5 + 3u^4 + u^3 - u^2 + 2u + 1$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_2, c_5$ <br> $c_6, c_7$ | $y^{11} + 15y^{10} + \cdots + 6y - 1$ |
| $c_3$ | $y^{11} + 7y^{10} + \cdots + 26y - 25$ |
| $c_4, c_8, c_9$ | $y^{11} + 11y^{10} + \cdots + 6y - 1$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \quad 0.691368 + 0.499908I$ | $11.24540 - 2.30219I$ | $-3.67978 + 2.86330I$ |
| $u = \quad 0.691368 - 0.499908I$ | $11.24540 + 2.30219I$ | $-3.67978 - 2.86330I$ |
| $u = \quad 0.081634 + 1.321480I$ | $3.47017 - 1.62554I$ | $-5.42199 + 3.91435I$ |
| $u = \quad 0.081634 - 1.321480I$ | $3.47017 + 1.62554I$ | $-5.42199 - 3.91435I$ |
| $u = -0.525209 + 0.369457I$ | $2.02228 + 1.65848I$ | $-4.54419 - 4.72916I$ |
| $u = -0.525209 - 0.369457I$ | $2.02228 - 1.65848I$ | $-4.54419 + 4.72916I$ |
| $u = -0.18554 + 1.42716I$ | $7.76699 + 4.26374I$ | $-1.04971 - 4.02329I$ |
| $u = -0.18554 - 1.42716I$ | $7.76699 - 4.26374I$ | $-1.04971 + 4.02329I$ |
| $u = \quad 0.23988 + 1.50376I$ | $17.7594 - 5.6984I$ | $-0.45524 + 2.83577I$ |
| $u = \quad 0.23988 - 1.50376I$ | $17.7594 + 5.6984I$ | $-0.45524 - 2.83577I$ |
| $u = \quad 0.395736$ | $-0.636835$ | $-15.6980$ |

## II. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_2, c_5$ <br> $c_6, c_7$ | $u^{11} - u^{10} + 8u^9 - 7u^8 + 22u^7 - 16u^6 + 24u^5 - 13u^4 + 9u^3 - 3u^2 + 1$ |
| $c_3$ | $u^{11} - u^{10} + 4u^9 - u^8 + 18u^7 - 2u^6 + 26u^5 - 3u^4 + 23u^3 - u^2 + 4u + 5$ |
| $c_4, c_8, c_9$ | $u^{11} + u^{10} + 6u^9 + 5u^8 + 12u^7 + 8u^6 + 8u^5 + 3u^4 + u^3 - u^2 + 2u + 1$ |

### III. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_2, c_5$<br>$c_6, c_7$ | $y^{11} + 15y^{10} + \cdots + 6y - 1$ |
| $c_3$ | $y^{11} + 7y^{10} + \cdots + 26y - 25$ |
| $c_4, c_8, c_9$ | $y^{11} + 11y^{10} + \cdots + 6y - 1$ |