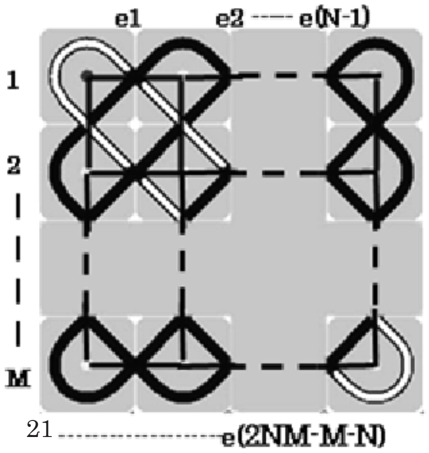

21: A lattice Kolam such that the Kolam pattern is drawn around all dots in the N x M matrix dot array is called a mat Kolam. In this Kolam, the loop number C is GCD(N x M). The author cannot find the proof of this result using the Tutte polynomial and also the invariant of T(G;−1,−1).

Fig. 2. (continued).

Table 1. Invariant values of the Tutte polynomial T(G; −1,−1) for E(G) and C(L); $T(G; -1, -1) = (-1) ** |E(G)| * (-2) ** (C(L) - 1)$, where C(L) is the link component number and |E(G)| is the edge number of the planar graph G without any isolated vertexes of a knot-link L. In this paper, the medial graph L of the graph G corresponds to the Kolam loop pattern, a regular planar graph with four degrees of a knot-link diagram. In the Kolam loop pattern, |E(G)| is the same number as the crossing number of L. G is the same graph as the N-line circuit of L. C(L) is obtained from the reverse lookup value of Table 1 or the following reversal equation; $C = Log_{-2}(T(G; -1, -1)/(-1)^{|E(G)|}) + 1 = Log_2(|T(G; -1, -1)|) + 1$, * for any |E(G)|, which should be larger than 2C-3. Each case indexed with the number is shown in Fig. 2 of the next section 5.

	E=0	1	2	3	4	5	6	7	8	9	10
C=1	T=1	−1	1	−1	1	−1	1	−1	1	−1	1
case	1	2		4	6, 7						
2	*	*	−2	2	−2	2	−2	2	−2	2	−2
case			3	5	8	10					
3	*	*	*	*	4	−4	4	−4	4	−4	4
case					9	11	12				
4	*	*	*	*	*	*	−8	8	−8	8	−8
case							13		14		
5	*	*	*	*	*	*	*	*	16	−16	16
case									15		
6	*	*	*	*	*	*	*	*	*	*	−32

method with computer software (program) will one day solve this problem.

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Appendix A.

Other ways how to get the component or loop number using matrixes.

After submitting the paper, the author was introduced by Prof. Nikkuni to the paper "On the Component Number of Links from Plane Graphs" by Daniel S. Silver and Susan G. Williams[8].

The author is introducing a way using matrix because the matrix way to obtain the loop number of a given Kolam pattern might have simpler formula than the way of the Tutte polynomial T(G; −1,−1) and it might be more programmable. Silver and Williams gave a short, elementary