A diagrammatic representation of an affine C Temperley–Lieb algebra

Dana Ernst, Plymouth State University

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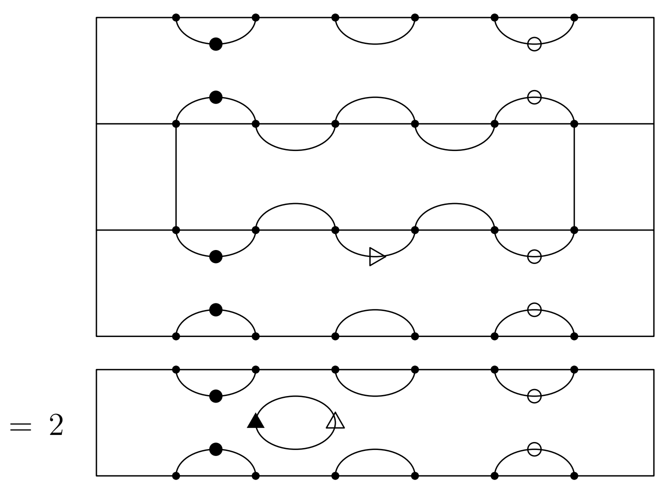
Abstract: The ordinary Temperley–Lieb algebra TL(A), invented by H.N.V. Temperley and E.H. Lieb in 1971, is a certain finite dimensional associative algebra, which arose in the context of statistical mechanics. Later in 1971, R. Penrose and L.H. Kauffman showed that this algebra can be realized as a certain algebra of diagrams. In 1987, V.F.R. Jones showed that the Temperley–Lieb algebra occurs naturally as a quotient of the type A Iwahori–Hecke algebra, $\mathcal{H}(A)$. Eventually, this realization of the Temperley–Lieb algebra as a Hecke algebra quotient was generalized by J.J. Graham to the case of an arbitrary Coxeter system X, which we denote by TL(X). Since then several diagrammatic representations of these generalized Temperley–Lieb algebras have been constructed for various Coxeter systems. In this poster, I describe an infinite dimensional associative diagram algebra that is a faithful representation of TL($\widetilde{C}$), where $\widetilde{C}$ is the Coxeter system of type affine C. Besides having a point of contact with physics, knot theory, and the theory of subfactors, these diagrammatic representations provide combinatorially tractable models for Kazhdan–Lusztig theory. The results of this research will be used to construct a trace on the Hecke algebra of type affine C, which will then be used to compute leading coefficients of certain Kazhdan–Lusztig polynomials in a non-recursive way.



An example of multiplication in TL($\widetilde{C}$).