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Admissible W -graphs

Given a Coxeter group W , a W -graph is a combinatorial structure that encodes a W -module, or more generally, a module for the associated Iwahori–Hecke algebra. By a theorem of Gyoja, it is known that every irreducible representation of a finite Coxeter group may be realized as a W -graph. Of special interest are the W -graphs that encode the Kazhdan–Lusztig cell representations of Hecke algebras, and more generally, the cell representations associated to blocks of irreducible representations of real Lie groups.

In this talk, our goal is to isolate some basic features of the W -graphs of cell representations, and use these to create a class of “admissible” W -graphs that is amenable to combinatorial analysis and (we hope) classification. In this direction, we will describe two theorems. First, a Dynkin diagram classification of all rank 2 admissible W -cells, and second, in the simply-laced case, a combinatorial characterization of all admissible W -graphs.