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Hecke algebras with independent parameters.

We study the Hecke algebra $\mathcal{H}(\mathbf{q})$ over an arbitrary field \mathbb{F} of a Coxeter system (W, S) with independent parameters $\mathbf{q} = (q_s \in \mathbb{F} : s \in S)$ for all generators. This algebra always has a spanning set indexed by the Coxeter group W , which is indeed a basis if and only if every pair of generators joined by an odd edge in the Coxeter diagram receive the same parameter. In general, the dimension of $\mathcal{H}(\mathbf{q})$ could be as small as 1. We construct a basis for $\mathcal{H}(\mathbf{q})$ when (W, S) is simply laced. We also characterize when $\mathcal{H}(\mathbf{q})$ is commutative, which happens only if the Coxeter diagram of (W, S) is simply laced and bipartite. In particular, for type A we obtain a tower of semisimple commutative algebras whose dimensions are the Fibonacci numbers. We show that the representation theory of these algebras has some features in analogy/connection with the representation theory of the symmetric groups and the 0-Hecke algebras. (Received December 14, 2015)