INVARIANT THEORY, SYMMETRIC GROUPS AND HOPF ALGEBRAS

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Abstract. In this talk I will describe the ring of invariants $K[\mathrm{End}(V \otimes W)]^{GL(V)\times GL(W)}$, where V and W are two finite dimensional vector spaces over a field of characteristic zero, and $GL(V) \times GL(W)$ acts by conjugation. This problem arises naturally in the study of finite dimensional semisimple Hopf algebras, and understanding this ring of invariants is the first step in classification of such Hopf algebras.

I will explain how one can approach this problem using the representation theory of the symmetric groups, and how in case $\dim(V) = \dim(W) = 2$ one can get a concrete calculation of the Hilbert series of this ring. The last part is based on a collaboration with Dejan Govc from the applied topology group in Aberdeen.