Variations on a theme of Ado.

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## Abstract:

The Ado theorem is a basic fact in the theory of Lie algebras saying that any finite-dimensional Lie algebra admits a faithful finite-dimensional representation. Somewhat surprisingly, the standard proof of such a basic fact utilizes non-trivial results about universal enveloping algebras and is quite involved. We will present an entirely different proof intrinsic to the category of finite-dimensional nilpotent Lie algebras, and will discuss possibilities to extend this proof to arbitrary Lie algebras.

We will also discuss the failure of an analog of the Ado theorem for "commutative analogs" of Lie algebras, i.e., commutative algebras satisfying the Jacobi identity.