Representation theory: a brief introduction from the $sl(n)$ perspective

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Abstract: Representation theory can be simply defined as the study of the ways a group acts on a vector space. A large piece of this process involves understanding weight spaces, particularly irreducible highest weight spaces. We will explore weight spaces of irreducible representations by looking at $sl(n, \mathbb{C})$, $U_q(sl(n))$ and $U_q(\hat{sl}(n))$. As the structure of the space becomes more complicated we utilize different combinatorics to understand these irreducible, highest weight spaces.

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