Computer exploration in Algebraic Combinatorics via SageMath

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This talk is divided into two parts. The first will be an introduction to the SageMath project from a personal perspective. From the SageMath website:

> **SageMath** is a free open-source mathematics software system licensed under the GPL. It builds on top of many existing open-source packages: NumPy, SciPy, matplotlib, Sympy, Maxima, GAP, FLINT, R and many more. Access their combined power through a common, Python-based language or directly via interfaces or wrappers.
>
> Mission: _Creating a viable free open source alternative to Magma, Maple, Mathematica and Matlab._

SageMath has become an essential tool in my field of research, algebraic combinatorics. The scope of algebraic combinatorics has grown so much as to encompass any area of mathematics "where the interaction of combinatorial and algebraic methods is particularly strong and significant" [Wikipedia]. This significant interaction between combinatorics and algebra is what makes many of the problems in this field amenable to computer exploration.

The first part of this talk will focus on the history and some features of the SageMath project. The second part will highlight a few examples of how computer exploration is used as a research tool in algebraic combinatorics.