Exploring Rim Hook Rules and Quantum Schubert Calculus

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The theory of quantum cohomology was initially developed in the early 1990s by physicists working in the field of superstring theory. Mathematicians then discovered applications to enumerative algebraic geometry, counting the number of rational curves of a given degree satisfying certain incidence conditions. The driving question in modern quantum cohomology is to find non-recursive, positive combinatorial formulas for expressing the quantum product of two Schubert basis elements. This theory applies now as much as ever to statistics about mapping projective curves to certain homogeneous varieties, but the impact now extends beyond enumerative geometry into many other aspects of algebraic geometry, combinatorics, representation theory, number theory, and even back to physics. In this talk we will discuss several problems in quantum Schubert calculus and explore ways in which one might implement these questions in Sage.