Abstract

The Lyndon-Schützenberger theorem is a famous result in the field of combinatorics on words. It defines a set of equivalent criteria for two words \(x\) and \(y\) to commute; that is, for \(xy = yx\). Though much is known about this theorem in its current form, some questions still remain. For instance, can it be generalized to words of higher dimension?

In this talk, I will introduce the Lyndon-Schützenberger theorem, present and prove the equivalence of two additional criteria for the theorem, and extend the theorem to the case of two-dimensional words. I will also offer some open problems and directions for future work.

This is a joint work with Jeffrey Shallit.