

Shellability in Group Theory

The notion of shellability was first defined and studied in the topological setting during the 1950's. It has since found applications in combinatorics, commutative algebra and group theory. Roughly speaking, an object is *shellable* if it can be constructed from simple pieces in a coherent fashion. It is known that the symmetric groups (and more generally, Coxeter groups) are shellable. It is also known that shellability is preserved by many familiar constructions. For example, the direct product of a finite number of shellable groups is shellable.

In this project we will explore the role of shellability in group theory. Possible lines of inquiry include

- Is shellability preserved by other group theoretic constructions (eg. semidirect product, free product, graph product)?
- How does shellability relate to the algorithmic and geometric properties of finitely generated groups?

Students applying for this project should have a strong background and interest in abstract algebra.