REU Student abstracts for Wreath Product $p$-Groups research project
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Methods for finding doubly-invariant subspaces for a fixed prime $p$
Jennifer Feder

For a fixed prime $p$, we wish to describe and count the doubly-invariant subspaces of $\mathcal{M}$. Throughout the paper we use the case $p = 5$ as an example. Complete results are already known for the primes 2 and 3. We describe a method for partitioning the doubly-invariant patterns, and then we prove two theorems characterizing a subset of doubly-invariant patterns for an arbitrary prime $p$.

Doubly-invariant subspaces for rectangular patterns
Briana Foster-Greenwood

We use the so-called Greedy Approach to construct large chains of doubly-invariant subspaces of the matrix space $\mathcal{M}$ (for an arbitrary prime $p$) corresponding to doubly-invariant rectangular patterns. Along the way, we determine recurrence relations involving the horizontal and vertical derivatives of the basis matrices used to define these subspaces.

Good corners and the greedy approach for constructing doubly-invariant subspaces
Jonathan Gross

We determine criteria which guarantee the existence of a so-called “good corner” for a doubly-invariant pattern. The Greedy Approach for constructing large chains of doubly-invariant subspaces of the matrix space $\mathcal{M}$ (for an arbitrary prime $p$) relies on the existence of a good corner.