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Dylan Heuer, Chelsey Morrow, Benjamin Noteboom, Sara Solhjem, Jessica Striker*
(jessica.striker@ndsu.edu) and **Corey Vorland**. *Chained permutations and alternating sign matrices - inspired by three-person chess.*

We define and enumerate two new two-parameter permutation families, namely, placements of a maximum number of non-attacking rooks on k chained-together $n \times n$ chessboards, in either a circular or linear configuration. The linear case with $k = 1$ corresponds to usual permutations of n , and the circular case with $n = 4$ and $k = 6$ corresponds to a three-person chessboard. We give bijections of these rook placements to matrix form, one-line notation, and matchings on certain graphs. Finally, we define chained linear and circular alternating sign matrices, enumerate them for certain values of n and k , and give bijections to analogues of monotone triangles and fully-packed loops. (Received August 26, 2016)