

# MATRIX GROUPS AND THE DIAGONAL OF A ROTATION MATRIX

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## Abstract

The statement that there exists a doubly stochastic matrix  $P$  such that  $y = Px$ , is equivalent to stating that  $y$  lives in the convex hull of  $\{(\lambda_{\sigma(1)}, \lambda_{\sigma(2)}, \dots, \lambda_{\sigma(n)}) : \sigma \in S_n\}$ . A basic intro to matrix groups and related ideas will be given. The theorem will be motivated and developed for lower dimension. Finally, examples will attempt to better illuminate the what the theorem communicates.