1077-F1-1585   **Jeff R. Knisley*** (`knisleyj@etsu.edu`). *On Generating Large Dimensional, Hand-Calculable Exercises and Applications.*

One of the challenges in Linear Algebra is in developing problems, projects, and exercises that are both larger dimensional and student-accessible. Indeed, round-off error, computational complexity, difficulty factoring characteristic polynomials of degree 3 or higher, and similar aspects often mean that any problems or applications of rank 3 or higher are approached solely via technology.

However, that same technology can be used to create student-accessible problems and applications of ranks 4 or 5 or even higher, even allowing the creation – if desired – of a technology-free course featuring only hand-calculable problems. In this presentation, we present a freely downloadable Maple worksheet that produces these types of problems. Moreover, it can be used to create hand-calculable applications of arbitrarily large rank involving stochastic matrices, eigenvalues and eigenvectors, Leslie matrix models, the simplex method, and several others. Options include the ability to restrict to integer arithmetic and limits on the number of operations required. (Received September 20, 2011)