Mathematical
Inequalities
& Applications
Volume 21, Number 2 (2018), 517–520 doi:10.7153/mia-2018-21-37

A COUNTEREXAMPLE TO A QUESTION OF BAPAT & SUNDER

STEPHEN DRURY

Abstract. The objective of this article is to provide a counterexample to a question of Bapat and Sunder concerning the relative magnitudes of the permanent of a positive semidefinite matrix and the largest eigenvalue of a related matrix. We also discuss the significance of this result in connection with the eigenvalues of the Schur matrix.

Mathematics subject classification (2010): 15A15.
Keywords and phrases: Permanent, Hadamard product, Oppenheim's inequality, permanent on top.

REFERENCES

[1] R. B. BAPAT, V. S. SUNDER, *On majorization and Schur products*, Linear Algebra Appl. **72** (1985), 107–117.
[2] R. B. BAPAT, V. S. SUNDER, *An extremal property of the permanent and the determinant*, Linear Algebra Appl. **76** (1986), 153–163.
[3] S. W. DRURY, *A Counterexample to a Question of Bapat and Sunder*, Electronic Journal of Linear Algebra **31** (2016), 69–70.
[4] S. W. DRURY, *A real counterexample to two inequalities involving permanents*, Mathematical Inequalities and Applications **20** (2017), 349–352.
[5] C. F. DUNKL, D. E. RAMIREZ, *Topics in harmonic analysis*, Appleton–Century–Crofts, New York, 1971.
[6] G. D. JAMES, *The Representation Theory of Symmetric Groups*, Lecture Notes in Mathematics, vol. 682, Springer–Verlag, New York, 1978.
[7] H. MINC, *Theory of permanents 1978–1981*, Linear Multilinear Algebra **12** (1983), 227–263.
[8] B. E. SAGAN, *The Symmetric Group*, Wadsworth & Brooks/Cole, Pacific Grove, 1991.
[9] V. S. SHCHESNOVICH, *The permanent-on-top conjecture is false*, Linear Algebra Appl. **490** (2016), 196–201.
[10] G. SOULES, *Matrix functions and the Laplace expension theorem*, Ph. D. Dissertation, University of California – Santa Barbara, July, 1966.
[11] F. ZHANG, *An update on a few permanent conjectures*, Special Matrices **4** (2016), 305–316.

© ELEMENT, Zagreb
Paper MIA-21-37
Mathematical Inequalities & Applications
www.ele-math.com
mia@ele-math.com