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Andrew V Sills*, asills@georgiasouthern.edu, and **Charles W Champ**. *Integer partitions and the exponential distribution analog of the Grubbs–Weaver method.*

In a 1947 paper, Grubbs and Weaver suggest a minimum-variance unbiased estimator for the population standard deviation of a normal random variable, where a random sample is drawn and a weighted sum of the ranges of certain subsamples is utilized. It turned out that the optimal choice, i.e. the partition that yields an estimate of minimum variance, involves using as many subsamples of size eight as possible. Grubbs and Weaver verified their results numerically for samples of size up to 100, and conjectured that their rule of eights is valid for all sample sizes greater than 100. In this talk, we examine the analogous problem where the underlying distribution is exponential instead of normal, and find that a “rule of fours” yields optimality. Because the order statistics of exponential random variables may be expressed in closed form, we can prove the result rigorously. Our proof involves reformulating the original statement of the problem into an integer linear program, and then solving it using combinatorial optimization techniques. (Received September 17, 2018)