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A skew Laplace distribution on integers

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Abstract We propose a discrete version of the skew Laplace distribution. In contrast with the discrete normal distribution, here closed form expressions are available for the probability density function, the distribution function, the characteristic function, the mean, and the variance. We show that this distribution on integers shares many properties of the skew Laplace distribution on the real line, including unimodality, infinite divisibility, closure properties with respect to geometric compounding, and a maximum entropy property. We also discuss statistical issues of estimation under this model.

Keywords Discrete Laplace distribution · Discrete normal distribution · Double exponential distribution · Exponential distribution · Geometric distribution · Geometric infinite divisibility · Infinite divisibility · Laplace distribution · Maximum entropy property · Maximum likelihood estimation