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### A Complex Analytic Introduction to Cumulant Moments

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Consider random variables whose distributions are uniquely characterized by their moments, where we assume they are all finite. Their properties can be more easily and elegantly understood by using cumulant moments. These can be defined and analyzed by applying complex analysis to the moment generating functions of these random variables.

By using these modified moments we can go beyond the typical mean-variance analysis of distributions. We can also introduce concepts such as skewness and kurtosis that involve higher moments of degree 3 and 4. In the spirit of CAARMS, we also reference a note by Dr. J. Ernest Wilkins Jr. on a key skewness and kurtosis inequality. Cumulant moments also allow us to obtain simple characterizations of Gaussian and Poisson distributions.