DATA605: Fundamentals of Computational Mathematics

Assignment 8

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03/20/2022

# Problem 1.

The price of one share of stock in the Pilsdorff Beer Company is given by on the nth day of the year. Finn observes that the differences appear to be independent random variables with a common distribution having mean and variance . If , estimate the probability the is:

## 1a. .

## 1b. .

## 1c. .

# Problem 2.

Calculate the expected value and variance of the binomial distribution using the moment generating function.

The moment generating function for the binomial distribution is . To calculate the mean and variance, we need the first and second derivatives of .

$$\mu &= g'(0) \\ &= n(pe^0+(1-p))^{n-1}(pe^0) \\ &= n(p+(1-p))^{n-1}(p) \\ &= n(1^{n-1})p \\ &= np$$

# Problem 3.

Calculate the expected value and variance of the exponential distribution using the moment generating function.