APMA 1650 Homework 08

Due: November 29, 2018

Due before class on Thursday, Nov 29, 2018. It can be dropped off in the APMA 1650 homework box on the first floor of the APMA department, 182 George St OR at class (before it starts).

Please attach the HW cover sheet to *the front of your HW* assignment. It can be found on Canvas. **Show all work and you MUST write up your own solutions.**

1. (20 points) Let $X_1, X_2, \cdots, X_n$ be a random sample of size n from the normal distribution with mean μ and variance σ^2.

   (a) Find the method-of-moments estimator of μ and σ^2.

   (b) Determine whether the method-of-moments estimators for μ and σ^2 are consistent or not.

2. (20 points) Compute the method of moments estimator and the MLE for λ, the parameter of an exponential distribution:

   $$f(x|\lambda) = \lambda \exp(-\lambda x)$$

   from a random sample of size n.

3. (20 points) The geometric probability mass function is given by

   $$p(y|\theta) = \theta(1-\theta)^{y-1}, \qquad y = 1, 2, 3, \cdots.$$

   A random sample of size n is taken from a population with a geometric distribution.

   (a) Find the method-of-moment estimator for θ when $n = 1$.

   (b) Find the MLE for θ.