Problem 1. *Suppose that X is a discrete random variable with $P(X = 1) = \theta$ and $P(X = 2) = 1 - \theta$. Three independent observations of X are made: $x_1 = 1, x_2 = 2, x_3 = 2$.*

a. *Find the method of moments estimate of θ.*

b. *Find the MLE of θ.*

c. *Find the asymtoptic variance of MLE.*

Problem 2. *Consider an i.i.d. sample of random variables with density function*

$$f(x|\sigma)\frac{1}{2\sigma}\exp\left(-\frac{|x|}{\sigma}\right)$$

a. *Find the method of moments estimate of σ.*

b. *Find the MLE of σ.*

c. *Find the asymtoptic variance of MLE.*