

Homework 1

Due 1/22/2001

1. Assume that we have a sample of size n where

$$Y_i = \beta_0 + \beta_1 X_i + e_i$$

and the errors e_i are iid $N(0, \sigma^2)$.

- (a) Find the maximum likelihood estimator of σ^2 , $\hat{\sigma}^2$. Hint: let $\tau = \sigma^2$ and maximize.
 - (b) Under the assumption of normal errors as above, find the $E(\hat{\sigma}^2)$.
 - (c) Is $\hat{\sigma}^2$ an unbiased estimate of σ^2 ? If not, find an unbiased estimate of σ^2 .
2. Problem 6.2 in CW (*please use formulas rather than the proof by example alternative*)
 3. Problem 6.3 in CW
 4. Problem 6.4 in CW
 5. Problem 6.12 in CW
 6. Problem 6.15 in CW