

STAT 700, Fall 2011
Homework 10 Problem
due Wed. November 30

1 Problem.

1. Return to Homework 9

Let observations Y_1, \dots, Y_n be described by the relationship,

$$Y_i = \theta X_i^2 + \varepsilon_i$$

where X_1, \dots, X_n are fixed constants and the $\varepsilon_1, \dots, \varepsilon_n$ are iid $N(0, \sigma^2)$.

- (a) Using matrix notation, find the MLE of $\theta, \hat{\theta}$. It might be useful to substitute another variable for X_i^2 and then replace it at the end.
- (b) Using matrix notation, find $E(\hat{\theta})$ and $Var(\hat{\theta})$.
- (c) Using matrix notation, find the MLE of $\sigma^2, \hat{\sigma}^2$.