Problem 4: LLMS estimation

(3/3 points)

Let $X = U + W$ with $\mathbf{E}[U] = m$, $\mathbf{var}(U) = v$, $\mathbf{E}[W] = 0$, and $\mathbf{var}(W) = h$. Assume that U and W are independent.

1. The LLMS estimator of U based on X is of the form $\hat{U} = a + bX$. Find a and b. Express your answers in terms of m, v, and h using standard notation .

$a =$ (h*m)/(v+h) ✔

$b =$ v/(v+h) ✔

2. Suppose we further assume that U and W are normal random variables and then construct $\hat{U}_{LMS}$, the LMS estimator of U based on X, under this additional assumption. Would $\hat{U}_{LMS}$ be the identical to $\hat{U}$, the LLMS estimator developed without the additional normality assumption in part (1)?

Yes ✔

You have used 1 of 2 submissions

DISCUSSION

Click “Show Discussion" below to see discussions on this problem.


Download on the
App Store


ANDROID APP ON
Google play