

Quiz 17 : Linear Regression

written by Alvin Wan . alvinwan.com/cs70 . Wednesday, November 7, 2016

This quiz does not count towards your grade. It exists to simply gauge your understanding. Treat this as though it were a portion of your midterm or final exam.

1 Concepts

1. (**True or False**) Given some linear estimate of $L[Y|X] = aX + b$, we have that $E[(Y - aX - b)X] = 0$. Provide justification.
2. (**True or False**) For any random variables X, Y, Z , where X, Z are independent and $X = \alpha Y + Z$, the signal-to-noise ratio (SNR) is $\frac{\alpha^2 E[Y^2]}{\sigma^2}$, where $\text{var}(Z) = \sigma^2$. (αY is our signal and Z is our noise.)

2 Quantities

For some large n , take n points along the unit square centered at the origin. (The corners of the unit square are $(1, 1), (1, -1), (-1, -1), (-1, 1)$). Compute $L[Y|X]$.