

Assume that m_n is a regression function that estimate random variable Y based on X and $D_n = \{(X_1, Y_1), \dots, (X_n, Y_n)\}$, and $m(X) = E[Y|X]$. What is the best possible performance of m_n in L_2 sense, i.e. $E\{\|m_n(X) - m(X)\|^2\}$?