ECON 7920
Econometrics II
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Problem Set 2
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Problem 1

Consider the population model that relates the price of a house sold ($price$) to the number of rooms in a house ($rooms$) and the number of bathrooms ($baths$). Assume the functional form for the conditional mean function is given by: $m(x, \theta_0) = exp(\theta_{01} + \theta_{02} rooms + \theta_{03} baths)$.

a. Under what conditions will the function $m(x, \theta_0)$ be identified for $\theta \in \Theta$?

b. Under the functional form assumption above, state the minimization problem clearly.

c. Using the functional form above what is the analytical expression for the score function $s(w_i, \theta)$?

d. What is the analytical expression for *expected* Hessian?

e. Using the nls command in R and the dataset $hprice.csv$, estimate the population model under consideration.[1]

f. Now construct the estimated average partial effects (APE) for each of the explanatory variables in the model. Call the APE estimator $\hat{\gamma}_j$. Explain how you would test $H_0 : \gamma_j = 0$ versus $H_1 : \gamma_j \neq 0$ where j indexes the variable of interest.

[1] nlsout=nls(price~exp(b0 + b1*rooms+b2*baths), start = list(b0 = 10, b1 = 0.04321,b2=.9))