# Problem Set 7

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.]The estimator for the Nelder-Mead won't compute because I have an error saying "(Y-(X*Beta)) are not conformable arrays". The matrix X is a 10,000x10 and matrix Beta is 10x1 which the multiplication of those two would output a 10,000x1 matrix. Matrix Y is a 10,000x1 vector and subtracting the new vector with the same dimensions should work. But for some reason that I do not know, it tells me that part is not a conformable array. Estimating the OLS objective function using L-BFGS and the linear model, I was able to get just about the same values of the true betas. For gradient descent, the values are converging to 3, but this arbitrarily does not seem correct to me. I am mainly skeptical I have not defined "function(x)" correctly in the gradient. The MLE estimation also came out very close to the true values, I did however get an 11th estimate for some reason.

| | Estimate | Std. Error | t value | Pr(>\|t\|) |
|---|---|---|---|---|
| X1 | 1.5028 | 0.0016 | 943.58 | 0.0000 |
| X2 | -1.0005 | 0.0016 | -627.64 | 0.0000 |
| X3 | -0.2481 | 0.0016 | -154.76 | 0.0000 |
| X4 | 0.7498 | 0.0016 | 469.90 | 0.0000 |
| X5 | 3.4989 | 0.0016 | 2197.70 | 0.0000 |
| X6 | -1.9975 | 0.0016 | -1251.42 | 0.0000 |
| X7 | 0.5010 | 0.0016 | 314.66 | 0.0000 |
| X8 | 0.9980 | 0.0016 | 627.81 | 0.0000 |
| X9 | 1.2493 | 0.0016 | 783.94 | 0.0000 |
| X10 | 1.9986 | 0.0016 | 1256.32 | 0.0000 |