

# PS8 Dawkins

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## 1 Problem 9 Regression Results

	(1)
X1	1.501*** (0.002)
X2	-1.001*** (0.002)
X3	-0.252*** (0.002)
X4	0.749*** (0.002)
X5	3.501*** (0.002)
X6	-2.001*** (0.002)
X7	0.499*** (0.002)
X8	1.003*** (0.002)
X9	1.247*** (0.002)
X10	2.001*** (0.002)
Num.Obs.	100 000
R2	0.991
R2 Adj.	0.991
AIC	145 143.6
BIC	145 248.3
Log.Lik.	-72 560.811
RMSE	0.50
+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001	

## 2 Discussion of All Method Results

The estimates of beta from a simple OLS (calculated manually in Problem 5 and Problem 9 using the linear regression model) are very similar to the betas that I generated at the beginning of the code. They are all roughly .001 off (though in X3, X8, and X9 this increases to around .003).

In examining the gradient descent, L-BFGS, and Nelder-Mead algorithms, we once again see very similar results. I note that the L-BFGS algorithm is ever more slightly precise.

Finally, in the MLE L-BFGS method of finding betas, I once again get close estimated betas.

Overall, all of the models to estimate the betas performed very well.