Problem Set 8

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1 Results

All relevant questions in PS8 should be answered implicitly by the following table:

Table 1: Coefficients using Different Optimization Methods

	True_Betas	LM	OLS_ClosedForm	LBFGS_Algo	NelderMead_Algo	GradientDescent
X1	1.500	1.501	1.501	1.501	1.501	1.501
X2	-1	-0.991	-0.991	-0.996	-0.996	-0.991
X3	-0.250	-0.247	-0.247	-0.256	-0.256	-0.247
X4	0.750	0.744	0.744	0.745	0.745	0.744
X5	3.500	3.504	3.504	3.507	3.507	3.504
X6	-2	-1.999	-1.999	-1.999	-1.999	-1.999
X7	0.500	0.502	0.502	0.497	0.497	0.502
X8	1	0.997	0.997	1.002	1.002	0.997
X9	1.250	1.256	1.256	1.246	1.246	1.256
X10	2	1.999	1.999	1.996	1.996	1.999

Table 2: LM Output

	Dependent variable:
	Y
X1	1.501***
	(0.002)
X2	−0.991***
	(0.003)
X3	−0.247***
	(0.003)
X4	0.744***
	(0.003)
X5	3.504***
	(0.003)
X6	−1.999***
	(0.003)
X7	0.502***
	(0.003)
X8	0.997***
	(0.003)
X9	1.256***
	(0.003)
X10	1.999***
	(0.003)
Observations	100,000
R^2	0.971
Adjusted R^2	0.971
Residual Std. Error	0.500 (df = 99990)
F Statistic	338,240.000*** (df = 10; 99990)
Note:	*p<0.1; **p<0.05; ***p<0.01