PS8

Alexandra Penner

March 2018

1

Closed form OLS produces betas of (1.5002896, -0.9978091, -0.2493249, 0.7485952, 3.5008834, -1.9997182, 0.5005669, 0.9993700, 1.2514150, 1.9996923)

Gradient descent found betas of (1.5, -1 ,-0.25, 0.75, 3.5, -2, 0.5, 1, 1.25, 2)

L-BFGS returned optimal values of (1.50029 -0.9978091 -0.2493249 0.7485952 3.500883 -1.999718 0.5005669 0.99937 1.251415 1.999692)

Neldermead returns (1.500996 -0.9970235 -0.2496825 0.7493175 3.50024 -1.999328 0.5030257 0.9982636 1.251686 2.001447) Which is a little different, but I'm not sure if that is just stochastic variation or a bias in the algorithm.

MLE returned betas of (1.500996 -0.9970235 -0.2496825 0.7493175 3.50024 -1.999328 0.5030257 0.9982636 1.251686 2.001447)

Table 1:

	Dependent variable:
	Y
X1	1.500***
	(0.001)
X2	−0.998***
	(0.001)
X3	−0.249***
	(0.001)
X4	0.749***
	(0.001)
X5	3.501***
	(0.001)
X6	−2.000***
	(0.001)
X7	0.501***
	(0.001)
X8	0.999***
	(0.001)
X9	1.251***
	(0.001)
X10	2.000***
	(0.001)
Observations	100,000
R^2	0.998
Adjusted R^2	0.998
Residual Std. Error	0.250 (df = 99990)
F Statistic	4,322,727.000*** (df = 10; 99990)
Note:	*p<0.1; **p<0.05; ***p<0.01