Problem Set 8

Karley Nadolski

March 31, 2021

1 Comparing $\hat{\beta}_{OLS}$ to β values

	$\hat{\beta}_{OLS}$ using lm()	True β values
X1	1.493	1.5
	(0.005)	
X2	-1.014	-1
	(0.010)	
X3	-0.238	-0.25
	(0.010)	
X4	0.728	0.75
	(0.010)	
X5	3.493	3.5
	(0.010)	
X6	-1.993	-2
	(0.010)	
X7	0.483	0.5
	(0.010)	
X8	0.996	1
	(0.010)	
X9	1.252	1.25
	(0.010)	
X10	1.980	2
	(0.010)	
Num.Obs.	10000	
R2	0.971	
R2 Adj.	0.971	
AIC	14359.7	
BIC	14439.0	
Log.Lik.	-7168.850	
F	33160.246	

The $\hat{\beta}_{OLS}$ estimates from using the lm() function are definitely similar to the true β values, but aren't as precise as estimates from other optimization

methods (like gradient descent, L-BFGS, or the Nelder-Mead algorithm). That being said, most of the estimates (besides X4) are within two standard errors of the true beta value. Even for the estimate for X4, the true value of $/beta$ is 0.75 and the $\hat{\beta}_{OLS}$ estimate is 0.728. With a standard error of 0.010, the true value lies just 0.02 beyond the estimate with the addition of two standard errors.