

Problem Set 8

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1 Question 5

Based on my output, the responses are close (see table 1), all within a thousandth rounding.

2 Question 6

On first initial inspection, the two models appear to be identical. Upon further inspection, any differences are found at e^{-14} .

True Beta	Estimated Beta	Difference
1.50	1.4995523	-0.0004476827
-1.00	-0.9984086	0.0015914221
-0.25	-0.2502771	-0.0002771308
0.75	0.7491285	-0.0008715269
3.50	3.4998545	-0.0001454896
-2.00	-2.0009140	-0.0009140185
0.50	0.4992039	-0.0007960655
1.00	0.9988006	-0.0011994357
1.25	1.2503899	0.0003898716
2.00	1.9998498	-0.0001502278

Table 1:

True Beta	CF OLS	Grad Descent	LBFGS	Nelder Mead	LBFGS v OLS Dif	NM v OLS Dif True Beta
1.50	1.4995523	1.4995502	1.4995523	1.4995523	-2.176037e-14	-9.430641e-09
-1.00	-0.9984086	-0.9984070	-0.9984086	-0.9984086	-3.541611e-14	8.715273e-09
-0.25	-0.2502771	-0.2502774	-0.2502771	-0.2502771	8.659740e-15	-4.841361e-09
0.75	0.7491285	0.7491277	0.7491285	0.7491285	1.865175e-14	1.202086e-08
3.50	3.4998545	3.4998488	3.4998545	3.4998545	-9.325873e-15	-2.987008e-08
-2.00	-2.0009140	-2.0009104	-2.0009140	-2.0009140	-1.865175e-14	1.391106e-08
0.50	0.4992039	0.4992029	0.4992039	0.4992039	-1.332268e-15	-1.569242e-08
1.00	0.9988006	0.9987983	0.9988006	0.9988006	1.376677e-14	4.648339e-09
1.25	1.2503899	1.2503886	1.2503899	1.2503899	6.883383e-15	-7.902403e-10
2.00	1.9998498	1.9998468	1.9998498	1.9998498	2.065015e-14	-6.837876e-09

Table 2: