

Hedonic Problem Set Report

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Q1.

LA

Mean:

County	House ID	House Price	Year Built	Square Foot	Bathroom	Bedroom
37	1107012.063	311463.926	1952.01876	1602.58218	1.98569178	3.09157726
59	1108678.728	296527.633	1981.45209	1541.96509	2.15192731	2.58722467
65	1093438.716	181315.317	1973.89449	1623.62299	2.20300657	3.12359778
71	1171698.129	188939.828	1979.33519	1679.6764	2.14879856	3.23983488
111	1124305.062	332179.352	1978.34596	1825.54504	2.3424373	3.34221863

County	Total Rooms	Stories	Violent Crime	Property Crime	Year of Sale
37	7.932443769	1.13457183	618.809523	1976.51539	1999.91664
59	6.104405286	1.59174009	314.470699	1414.15681	1999.93998
65	6.132339565	1.19949469	616.382079	2436.70124	1999.82567
71	6.512745098	1.36482972	567.669391	2216.85848	2000.39754
111	6.642999278	1.48824648	335.663616	1241.45292	2000.05462

Variance:

County	House ID	House Price	Year Built	Square Foot	Bathroom	Bedroom
37	2.99376E+11	33942721831	240.439066	388140.973	0.63658388	0.69428087
59	2.6458E+11	30953601267	61.1363763	582421.099	0.45335844	0.82331954
65	2.99694E+11	11065383445	212.658027	329746.33	0.4548194	0.63225427
71	2.93007E+11	12133249510	329.251437	389720.428	0.38646142	0.70516969
111	2.88026E+11	29798698555	261.878758	563030.2	0.51802005	0.8037673

County	Total Rooms	Stories	Violent Crime	Property Crime	Year of Sale
37	4.266282188	0.119352413	77212.9287	363360.242	17.6570308
59	2.325478994	0.269587015	18926.9725	206208.152	15.4169279
65	1.869341689	0.162736619	77673.7466	681390.237	17.903409
71	2.657460446	0.235281475	61450.6347	368819.312	17.3121685
111	2.666774682	0.26150082	23602.3725	112945.022	17.0726339

SF:

Mean

County	House ID	House Price	Year Built	Square Foot	Bathroom	Bedroom
1	506135.1617	398873.1171	1962.17447	1672.36158	2.0314922	3.17236625

13	505004.9639	374582.3608	1976.76117	1833.1482	2.24779821	3.30335691
75	466300.0724	501817.0863	1945.13257	1497.93269	1.73122589	2.61824094
81	484619.9418	503715.0083	1967.16667	1587.40496	2.04414991	2.73966838
85	494268.0924	464683.1897	1971.45669	1662.78732	2.16185856	3.21450405

County	Total Rooms	Stories	Violent Crime	Property Crime	Year of Sale
1	6.506235768	1.434174518	441.499342	1971.12829	2000.34516
13	8.014587459	1.432248939	415.783267	1898.75028	2000.55541
75	5.867503592	1.34167738	586.162852	2141.65373	1999.94978
81	5.933999928	1.35557314	349.079141	1713.20429	2000.26109
85	6.847878734	1.401984672	322.558114	1358.68293	2000.23945

Variance:

County	House ID	House Price	Year Built	Square Foot	Bathroom	Bedroom
1	46521640970	41544980702	697.85835	437987.58	0.57241768	0.7728215
13	45117257075	46561031579	379.707879	563350.088	0.50037351	0.83612014
75	48067632432	65620319073	966.905052	365112.226	0.65790174	1.02139467
81	46748978273	73286582870	462.758853	466259.415	0.56517718	0.97725774
85	47168221728	55932151423	347.083201	410670.707	0.44054718	0.8921065

County	Total Rooms	Stories	Violent Crime	Property Crime	Year of Sale
1	2.469335547	0.260794341	39922.3958	371046.524	17.7719081
13	4.266371519	0.245412108	77245.9192	359813.907	17.1362193
75	3.493863734	0.312683527	43581.4105	122186.393	18.3596019
81	3.636281198	0.251089991	42814.5567	1468429.52	17.8774106
85	3.48604034	0.270534245	17379.2292	80485.5685	17.9127809

Q2:

LA:

	Point Estimate	Standard Deviation
Constant	428815.7282	1561766.2
Year Built	731.1809141	1592.87133
Squre Foot	147.189168	2.53735149
Bathrooms	18668.71193	524.303926
Bedrooms	-25379.0573	342.301857
Total Rooms	-2271.383468	763.905473
Stories	-1482.105786	548.028139
Violent Crime	-198.8565991	3.1348791
Property Crime	6.787247759	1.41338049
Property Crime^2	0.000159636	0.00022535
Year Built^2	-0.454252909	0.40615399
Total Rooms^2	529.2397679	47.0901223
Violent Crime^2	0.072108307	0.00166201
Squre Foot^2	8.09E-05	0.00060246
D59	-7498.03249	1059.60578
D65	-104057.7428	756.196749
D71	-108213.6649	634.473865
D1993	23981.69621	855.264366
D1994	5230.612345	954.298981
D1995	-8746.842102	957.726174
D1996	-15362.98423	835.765188
D1997	-15892.25922	824.902494
D1998	-6083.979297	780.792937
D2000	10713.81567	787.462031
D2001	24386.80869	770.345643
D2002	48623.11332	770.176385
D2003	88187.78525	869.343728
D2004	149545.2982	1009.53592
D2005	201310.4394	998.737716
D2006	220971.269	1067.55613
D2007	206049.755	1259.28751
D2008	77964.72387	1219.58343

SF:

	Point Estimate	Standard Deviation
Constant	-21072914.89	1673716.44
Year Built	23084.29427	1705.91796
Square Foot	234.7345375	2.95874781
Bathrooms	21680.05427	722.064841
Bedrooms	-19333.57169	441.356572
Total Rooms	30726.83013	1120.73456
Stories	-28403.83114	615.914776
Violent Crime	-225.1711063	3.94495122
Property Crime	-82.03774157	1.77521079
Property Crime^2	0.009319009	0.0002792
Year Built^2	-6.270300046	0.43468235
Total Rooms^2	-1905.501407	76.9790103
Violent Crime^2	0.111609864	0.00219161
Square Foot^2	-0.001006847	0.00067122
D13	-58351.50962	604.591987
D75	154459.5576	1841.57263
D81	92095.55059	1027.40591
D85	35949.48025	573.371479
D1993	-46040.47182	1091.72473
D1994	-17406.59381	1243.39101
D1995	-32502.13479	1130.82713
D1996	-43951.73825	1062.96632
D1997	-22901.50027	1114.53962
D1998	-6639.791627	1121.08439
D2000	65691.15581	1113.66958
D2001	80782.35833	1220.72534
D2002	90073.41661	1119.58094
D2003	108304.5102	1114.88523
D2004	166158.8364	1193.63413
D2005	255537.0138	1277.11599
D2006	260548.1501	1280.06644
D2007	240559.1417	1501.17474
D2008	111878.1307	1732.56578

Q3

First stage:

LA:

	Point Estimate	Standard Deviation
Violent Crime	-198.8565991	3.1348791
Violent Crime ²	0.111609864	0.00219161

SF:

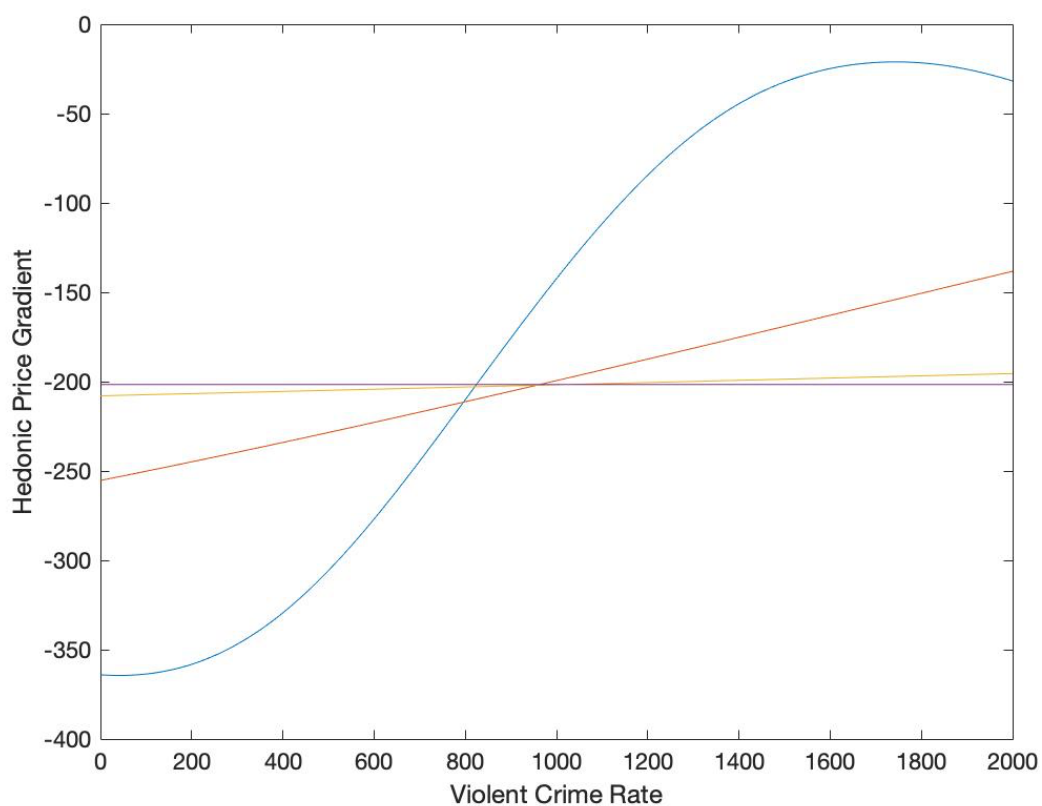
	Point Estimate	Standard Deviation
Violent Crime	-225.1711063	3.94495122
Violent Crime ²	0.111609864	0.00219161

Second Stage:

	Point Estimate	Standard Deviation
Constant	-206.4663131	2.50609549
Violent Crime	0.163805233	0.002765
Asian/Pacific	1.116380769	0.48807253
Black	-0.526636523	0.09137932
Hispanic	-1.686497463	0.25604936
Income	7.00E-07	9.38E-07

The results I get do not seem sensible. Based on economic theory, the MWTP for violent crime rate should increase in absolute value when the violent crime rate increases. Notice that the point estimate of the constant is -206.4663131. This implies that the coefficient of violent crime rate should be negative according to economics theory. However, the second stage estimate of violent crime rate is 0.163805233, which indicates that the MWTP for violent crime decrease in absolute value when the violent crime rate increases. This result violates the economics theory.

Q4



Q5

	Point Estimate	Standard Error	tstat	Pvalue
Constant	-295.3384838	0.46801504	-631.04486	0
Income	-3.34E-05	2.43E-06	-13.732758	7.60E-43
Asia/Pacific	-0.759023082	0.89124212	-0.8516463	0.39441409
Black	50.83003327	1.38287876	36.7566808	3.01E-292
Hispanic	21.48428305	0.70288635	30.5657992	1.72E-203

Q6

	Point Estimate	Standard Error
Constant	328.6787561	22.8678265
Violent Crime	-1.071484375	0.04714538
Income	-0.000378169	1.10E-05
Asian/Pacific	-15.77832152	1.06609351
Black	292.9868048	8.97621243
Hispanic	151.9564554	4.50006637

The above table displays the result of implementing the concentrated MLE method described in Bishop-Timmins (2019). The estimates in this task have two major differences from the estimates in task #3. First, the point estimate of the coefficient of violent crime rate becomes negative (-1.07), which reconciles the economics theory. Second, the magnitude of the point estimate of the coefficient of violent crime rate is much larger. These two differences show that the Bishop-Timmins estimator matches our prior economics theory and it is a better estimator to use when we want to measure the welfare cost of a non-marginal increase/decrease in violent crime rate.