

A close-up photograph of a cup of coffee with a thick layer of brown foam and bubbles. A blue geometric shape, resembling a stylized 'L' or a corner of a cube, is overlaid on the left side of the image. The text is centered over the coffee.

Best Place to Live in NJ

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IBM Capstone Project

Problem Statement

- A customer approaches a real estate agent, and asks: Where is the best place to live in NJ where there are a good number of things to do, availability to grocery stores and necessities, and has a reasonable price?
- Most people don't have time to wait around, so they look for a quick guide to get an idea of how the state of NJ is! Lucky for the customer, this analysis is exactly that!

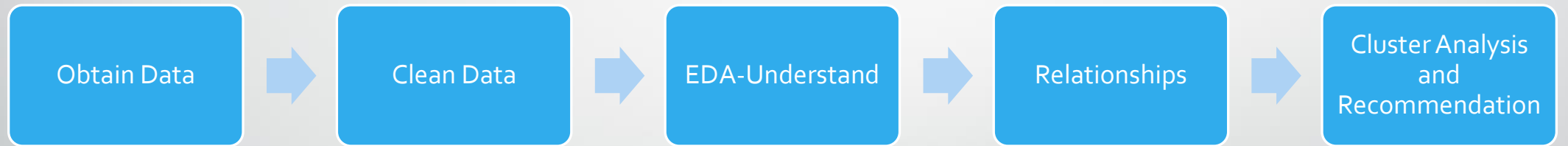


Data!!

- There are four sources of data that was used in this analysis.
- The first is geolocation data of each town in the state of New Jersey which provides us with the name of the town, zip code, and the Latitude and Longitude points.
- The second set of data is the County information from Wikipedia in which Beautiful Soup is used to scrape the data of County Name, its FIPS code, density, population and Area for each county in NJ.
- The third set of data is given by the State of NJ division of taxation which gives a breakdown of average residential sales prices for each town in NJ for the Year of 2020.
- Lastly, we utilize the Foursquare API to find venues in a 5-mile radius of each town.

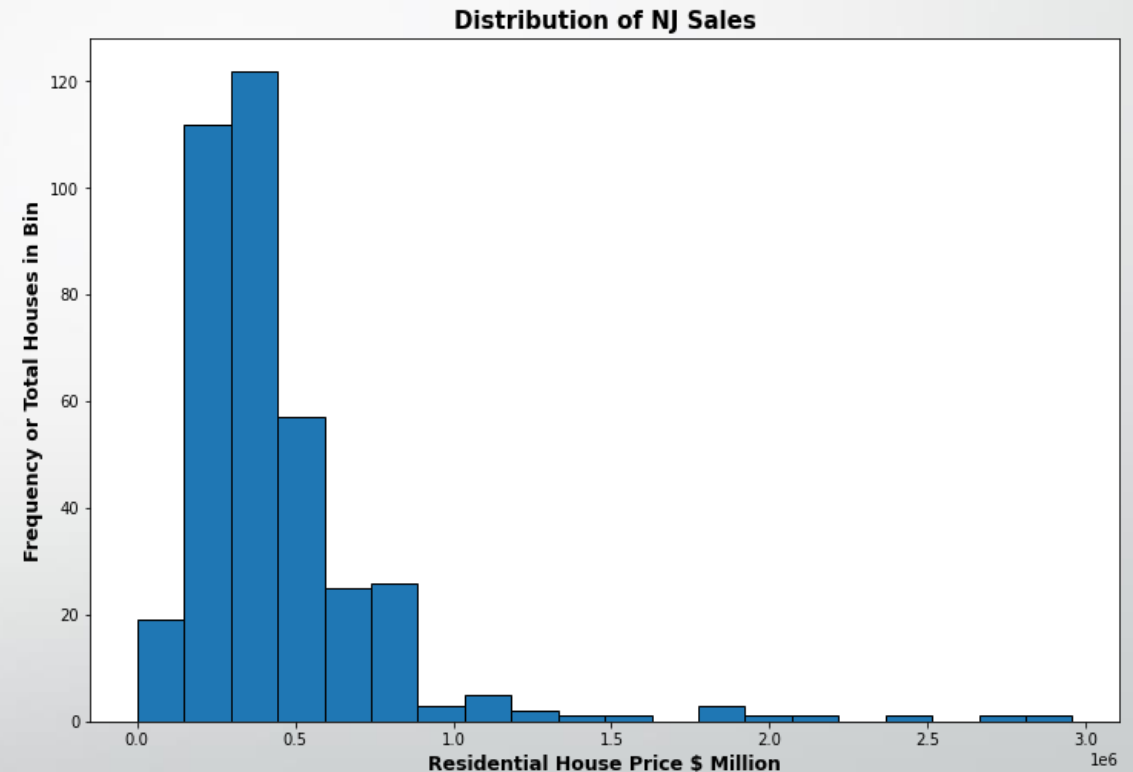


Methodology



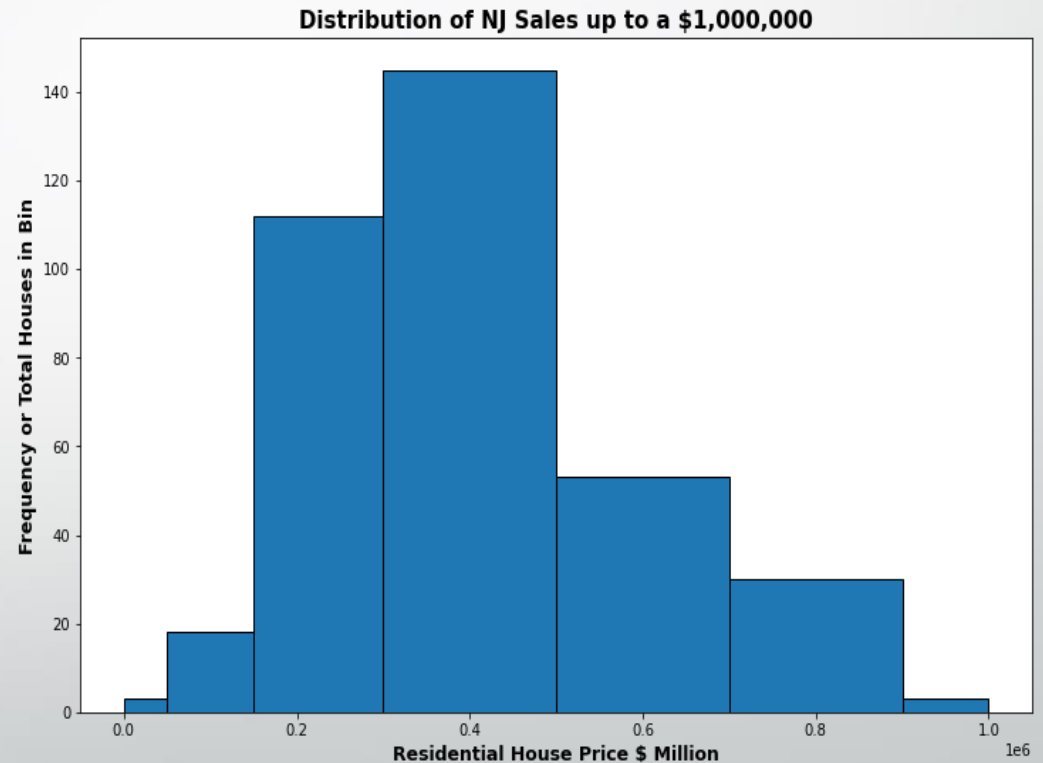
EDA- Overall House Price Distributions

- Median Cost of House prices in NJ is \$366,460 and a mean of \$443,232 with a standard deviation of \$350,000.
- The max house price is \$2,958,280.00 and the minimum house price is \$65,000.



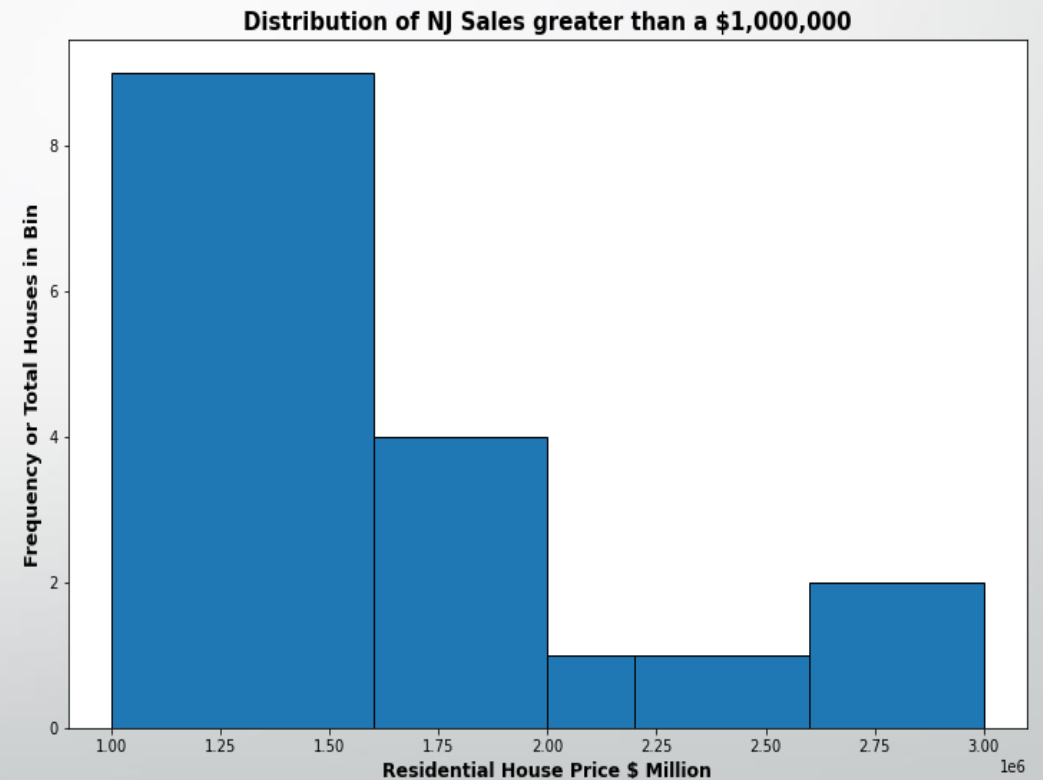
EDA- NJ House Price lower than \$1MM

- The houses that cost more than a \$1,000,000 the total number of houses reduced to 364 sales.
- the median cost remained similar our first analysis at \$352,419 however the mean got corrected to \$385,470 with a standard deviation of \$191,463.
- The minimum house price considered here is \$65,000 and the maximum price is \$973,150.

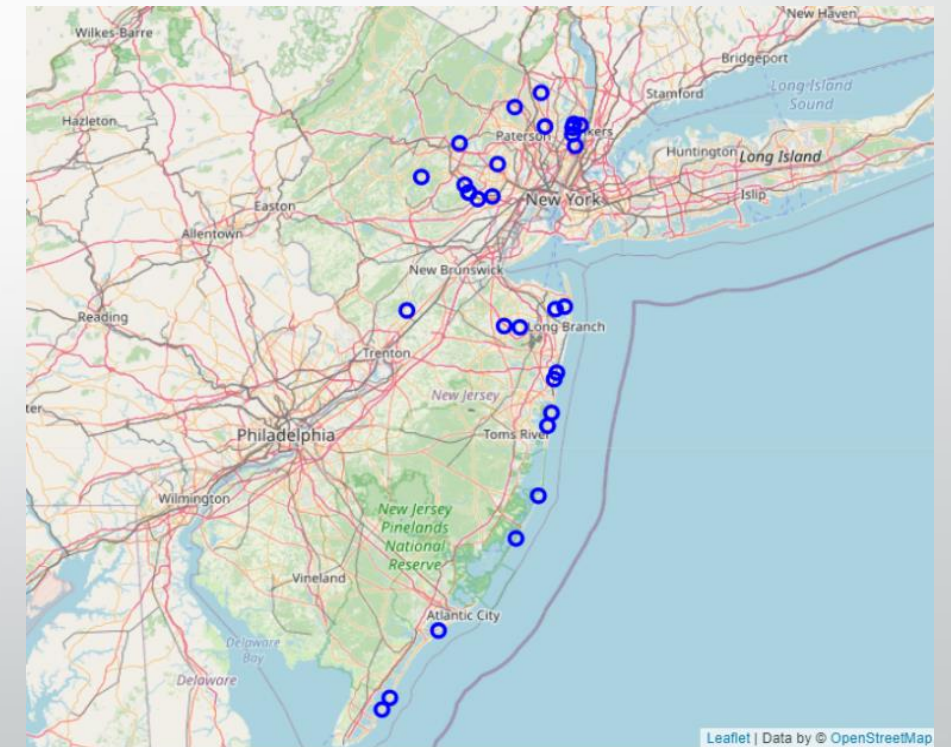
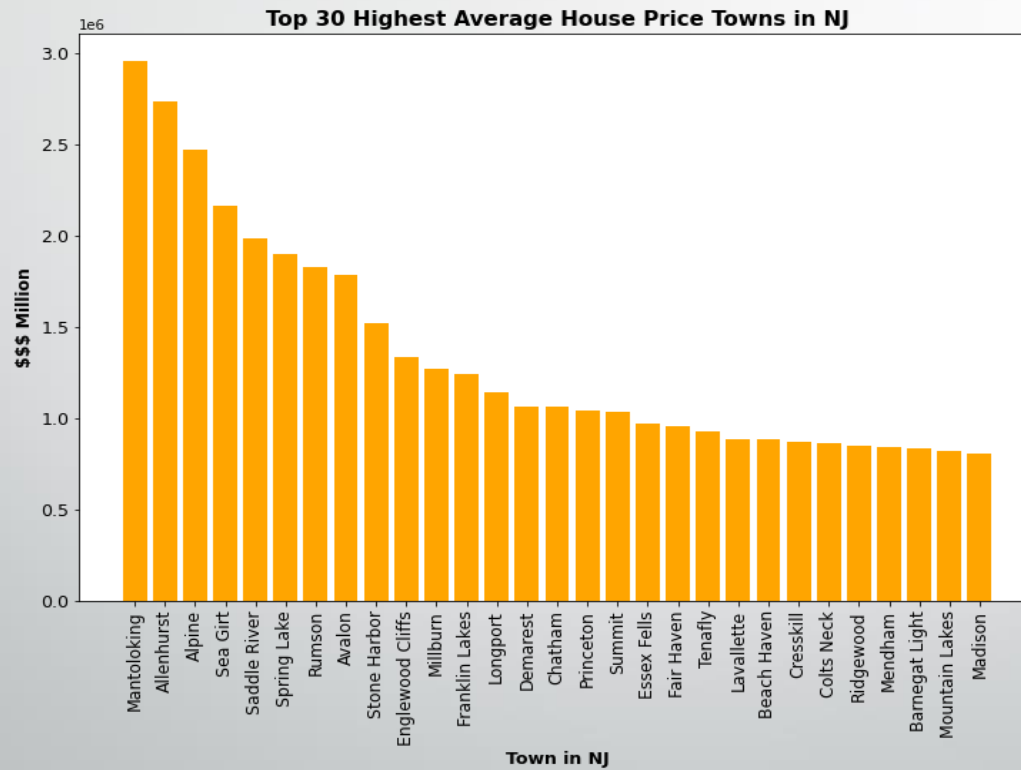


EDA- NJ House Price greater than \$1MM

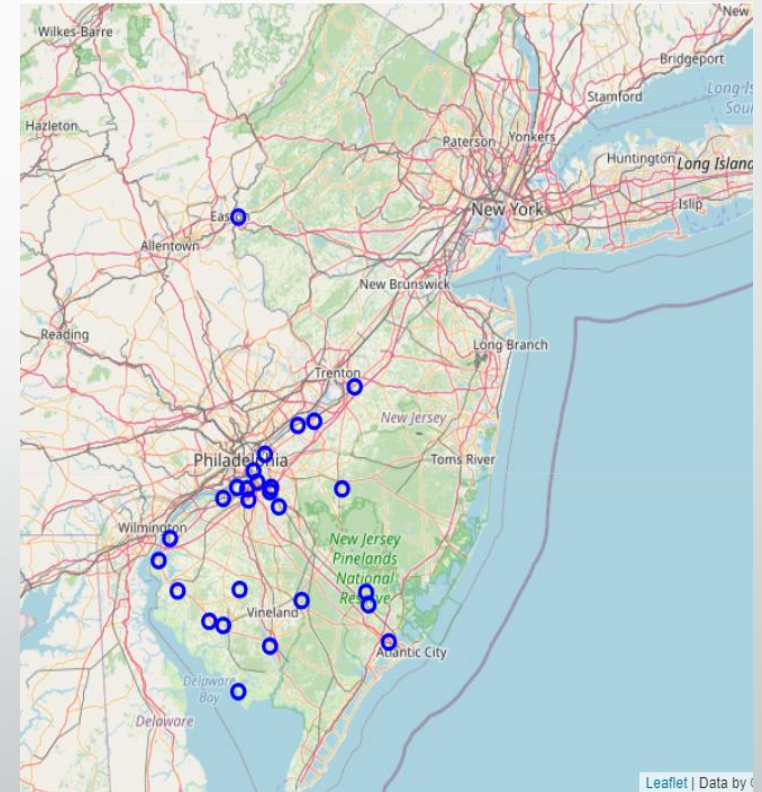
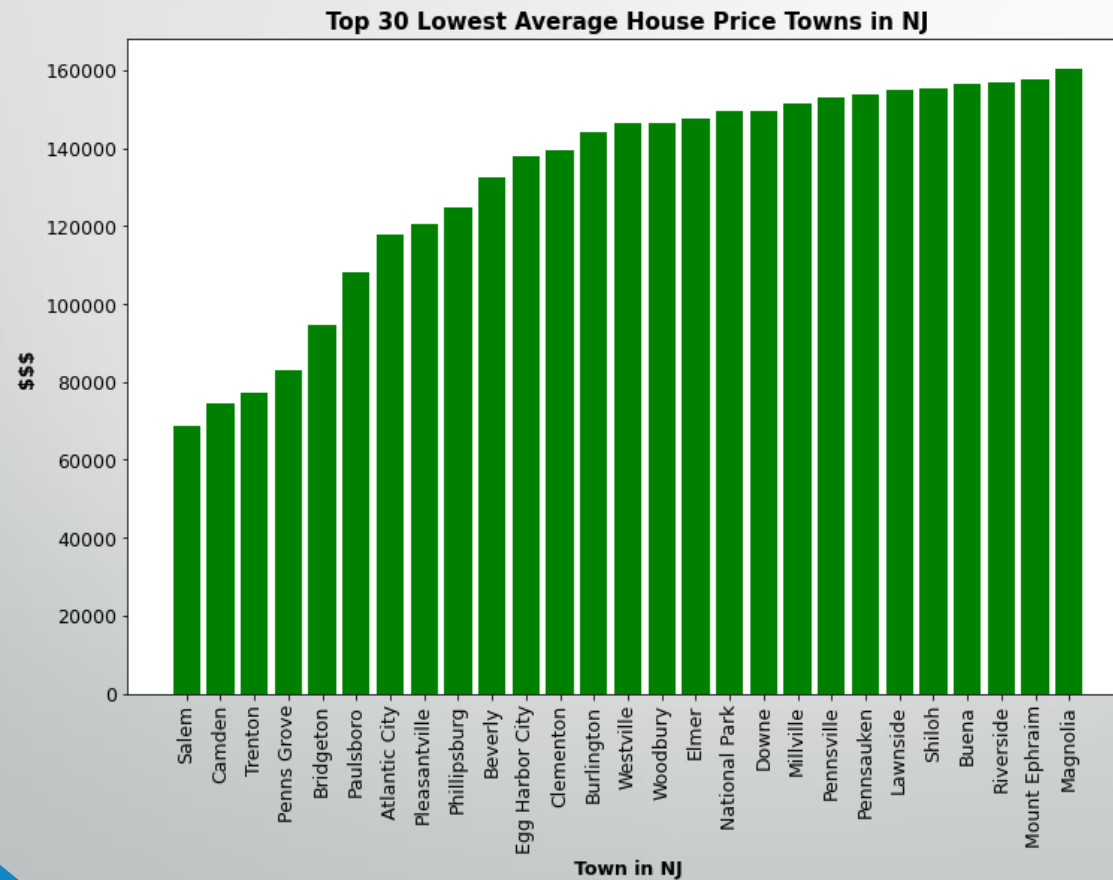
- This accounts for 17 total sales
- A median of \$1,523,616 and a mean of \$1,680,015 with a standard deviation of \$619,619.
- The minimum house price greater than a million dollars was \$1,038,792 and the maximum house price was \$2,958,280.
- Most houses sold were within the 1-1.6 million dollar range and anything over it is pretty rare.



Top 30 Highest Prices and Location

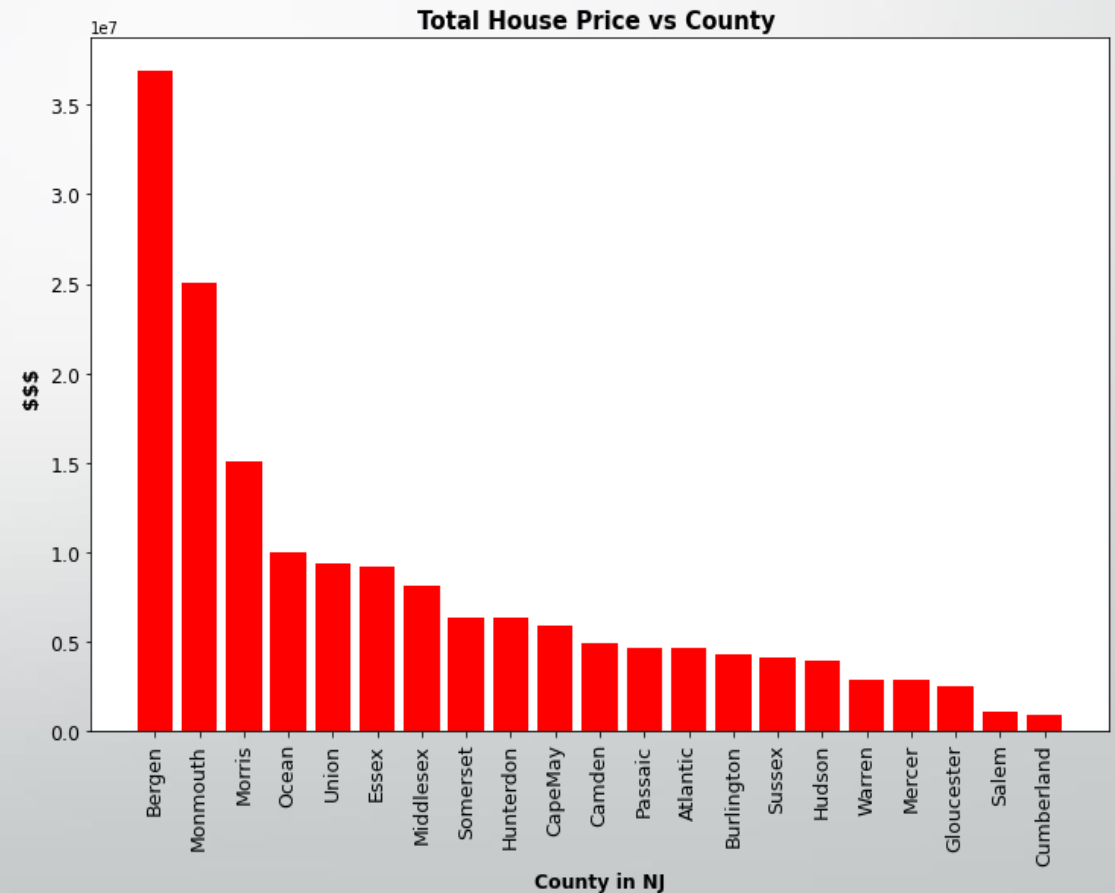


Top 30 Lowest Prices and Location

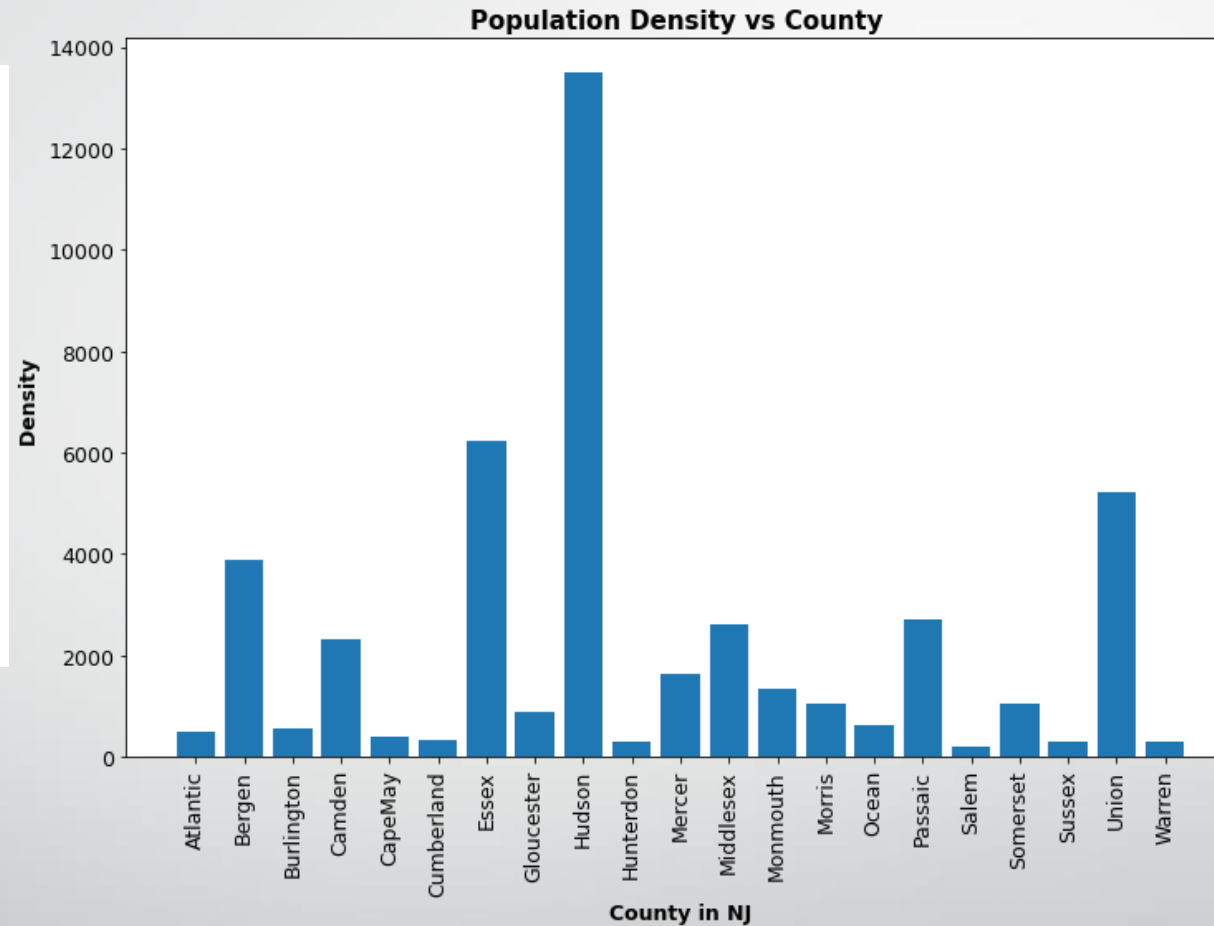


NJ County Analysis

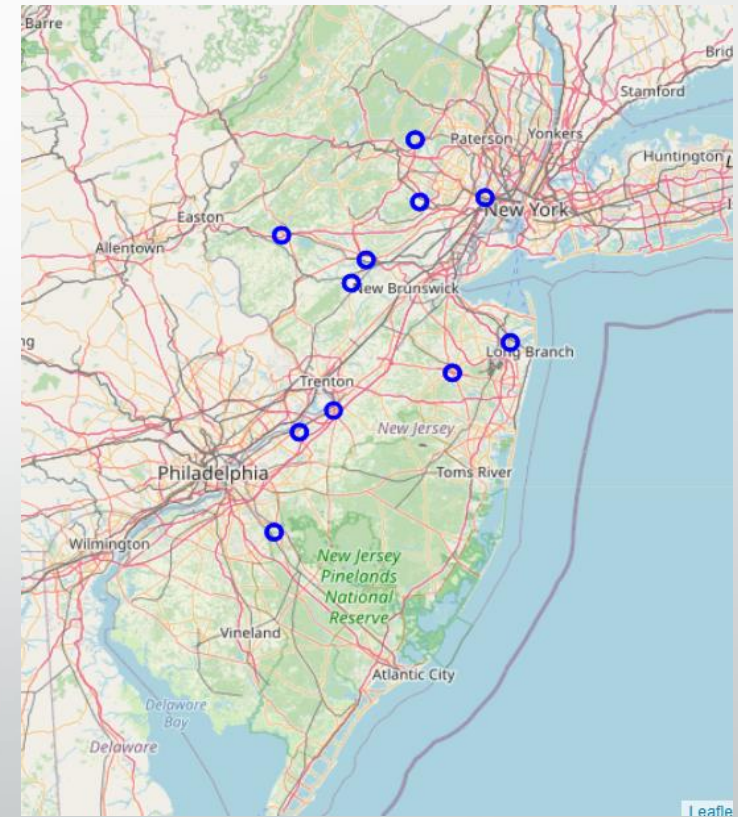
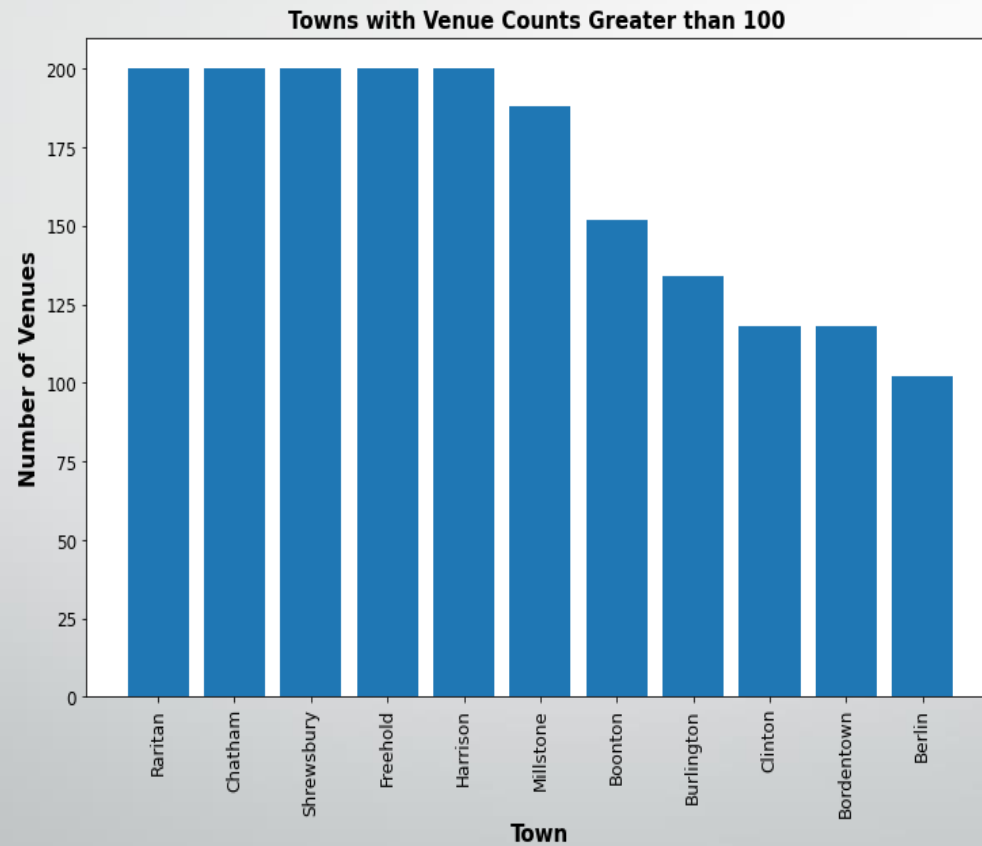
- The most expensive County in NJ is Bergen county mainly due to its proximity to NYC.
- The cheapest county in NJ is Cumberland County which is located in South Jersey.
- The second most expensive county is Monmouth County due to its historical nature, and the median household income is high at around \$175,000.
- It can be attributed to the proximity to NJ's pharmaceutical and industry in proximity.



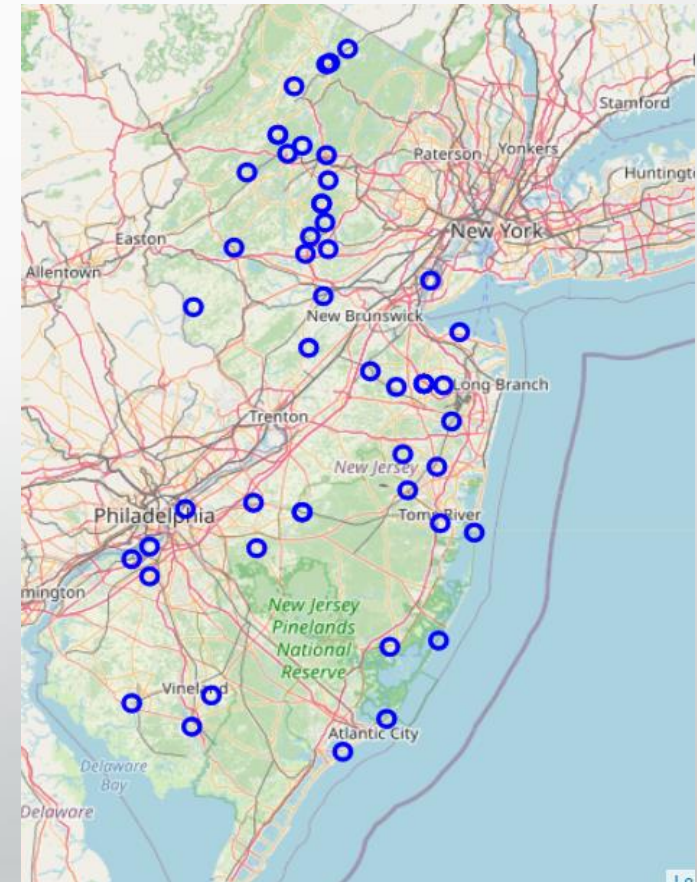
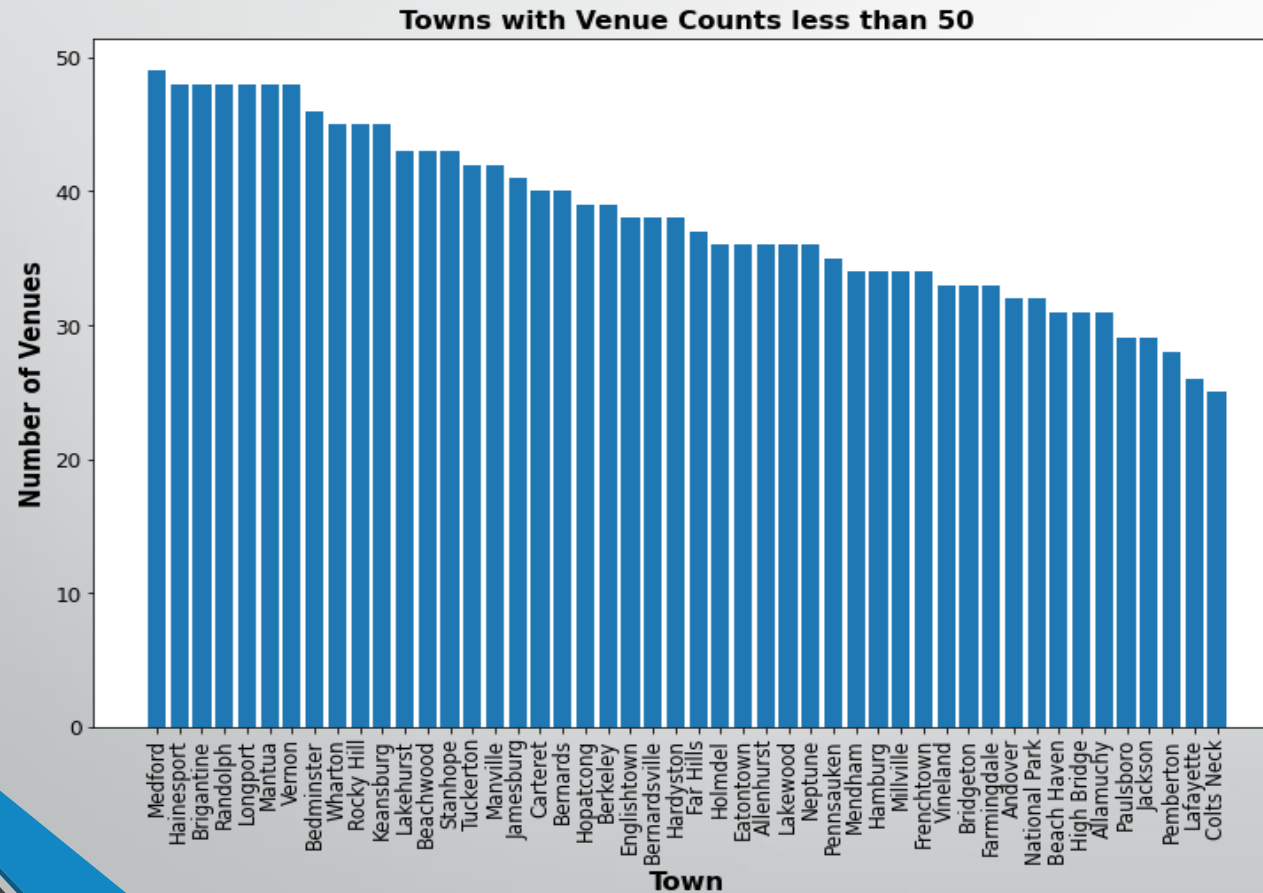
Population Density vs County



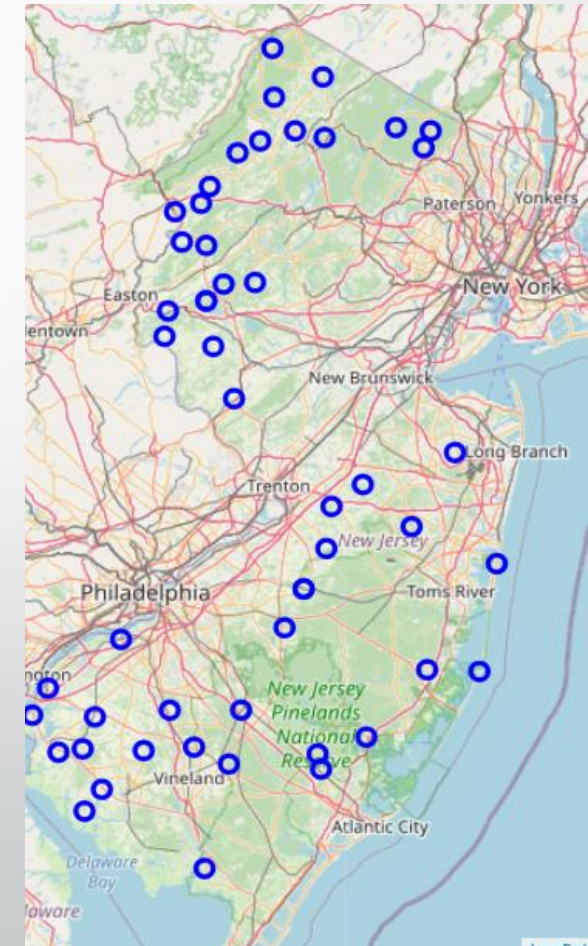
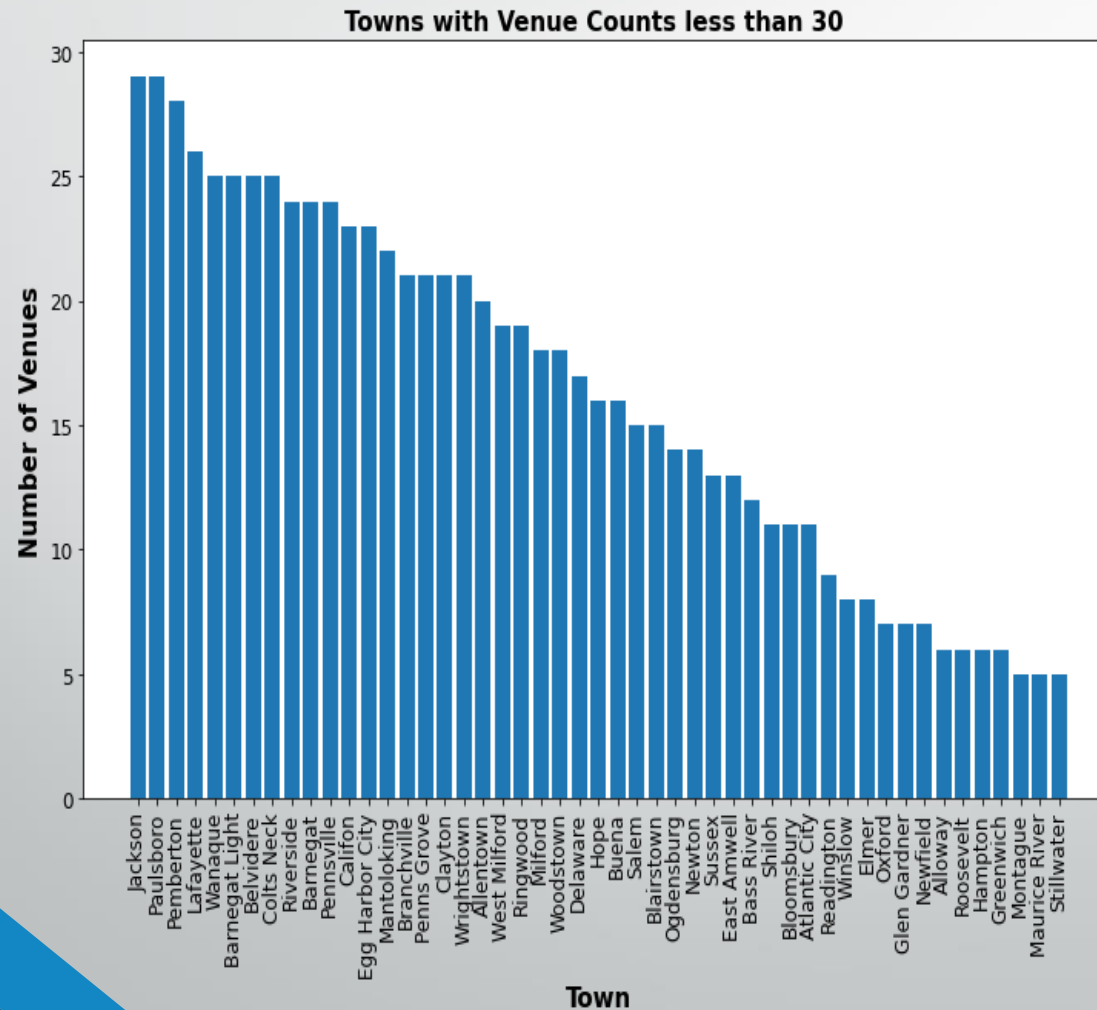
Towns with Venue Counts Greater than 100



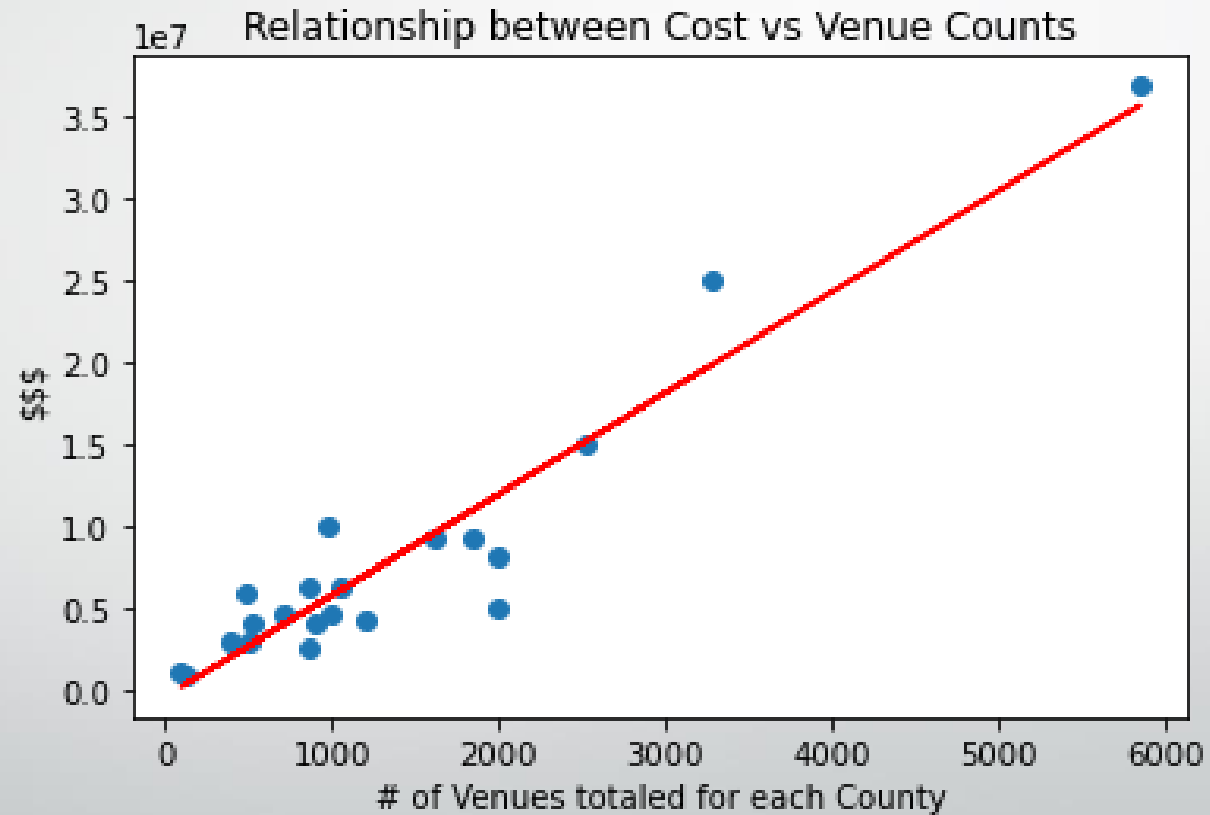
Towns With Venue Counts less than 50



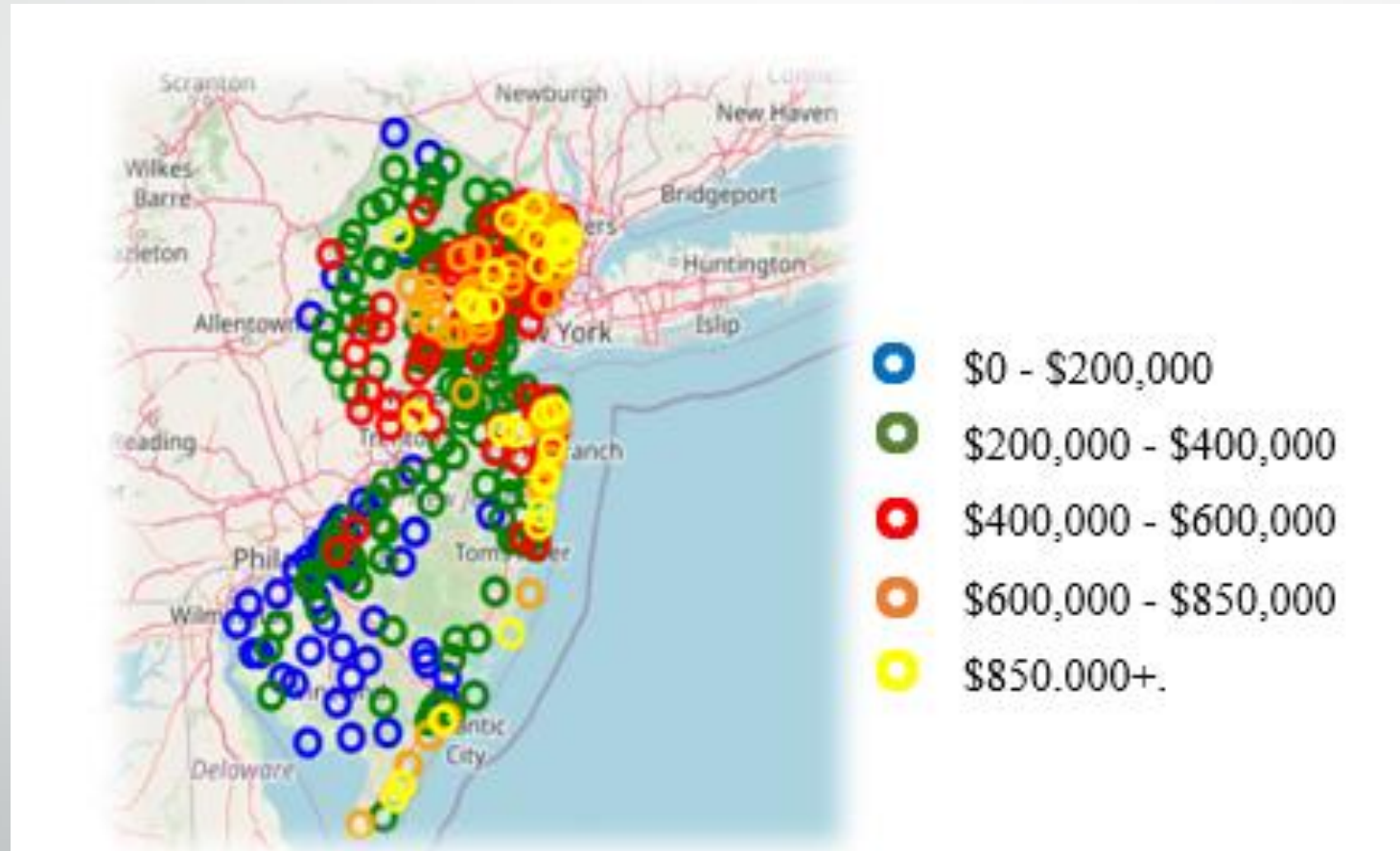
Towns With Venue Counts Less than 30



Relationship Between Cost and Venue



- $R^2 = .899$



Cluster A Rec. – Min Price, Max Venue

- Cluster A: Cluster A consists of Counties which have houses priced between 0 and \$200,000, and maximizes the venue counts. These counties include Warren, Gloucester, Camden, Burlington, Monmouth, and Essex County.
- The median house price in these counties is \$164,617, a mean of \$156,924 with a standard deviation of \$26,798. The county and list below shows a breakdown of towns and list of towns which satisfy these conditions.

	Avg Sale Price	Venue
County		
Warren	124587.318200	100.000000
Gloucester	146464.322900	100.000000
Camden	156910.045600	95.222222
Burlington	159366.947367	109.666667
Monmouth	165000.000000	200.000000
Essex	184455.009700	100.000000

Cleaned City	Avg Sale Price	Venue
Burlington	144096.7653	134
Maple Shade	168524.4565	100
Palmyra	165479.6203	95
Bellmawr	168120.3667	83
Camden	74312.2152	85
Lawnside	155007.6923	92
Magnolia	160177.2727	100
Mount Ephraim	157788.0328	100
Oaklyn	184802.8846	100
Runnemede	170032.7941	97
Somerdale	163463.2353	100
Stratford	178485.9167	100
Irvington	184455.0097	100
Woodbury	146464.3229	100
Shrewsbury	165000.0000	200
Phillipsburg	124587.3182	100

Cluster B Rec. – Min Price, Max Venue

- Cluster B: Cluster B consists of Counties which house houses priced between \$200,000 and \$400,000 and maximizes the venue counts in a 5 mile radius from each town. This makes up majority of NJ and is distributed all throughout NJ.
- The median house prices in this cluster are \$321,448 and a mean of 314,500 with a 56,412 Standard Deviation.

	Avg Sale Price	Venue
County		
Atlantic	221513.546900	85.500000
Sussex	224871.934800	100.000000
CapeMay	236821.333300	100.000000
Mercer	242469.525000	91.000000
Camden	246265.039278	96.000000
Gloucester	257252.875933	117.666667
Burlington	280310.002850	126.000000
Essex	301801.893920	100.000000
Union	316083.200111	99.111111
Ocean	318474.007800	91.333333
Monmouth	323573.510725	120.750000
Hunterdon	327129.166650	100.000000
Somerset	327318.480175	142.750000
Middlesex	334460.893920	97.466667
Morris	334534.224150	100.000000
Warren	352024.137900	100.000000
Passaic	352487.102143	97.000000
Bergen	370410.664933	100.000000
Hudson	372438.587000	100.000000

Cluster B Town Recommendations

Cleaned City	Avg Sale Price	Venue	County
Northfield	215845.0179	90	Atlantic
Somers Point	227182.0759	81	Atlantic
Bogota	375388.2353	100	Bergen
Elmwood Park	354441.8182	100	Bergen
East Rutherford	388250.0000	100	Bergen
Garfield	383247.6340	100	Bergen
Hackensack	271762.2340	100	Bergen
Little Ferry	392099.0000	100	Bergen
Lodi	396525.5814	100	Bergen
Ridgefield Park	396981.4815	100	Bergen
South Hackensack	375000.0000	100	Bergen
Bordentown	297853.3868	118	Burlington
Burlington	262766.6189	134	Burlington
Audubon	212134.2233	100	Camden
Barrington	220302.2000	100	Camden
Berlin	247236.7021	102	Camden
Berlin	200272.3684	102	Camden
Cherry Hill	269816.1894	89	Camden
Collingswood	254706.2529	100	Camden
Haddon Heights	293031.9101	82	Camden
Merchantville	227141.6667	100	Camden
Voorhees	291743.8406	89	Camden
Wildwood	236821.3333	100	CapeMay
Belleville	292866.4629	100	Essex
Bloomfield	372785.5581	100	Essex
East Orange	227646.1525	100	Essex
Newark	215940.6597	100	Essex
Nutley	399770.6364	100	Essex
Franklin	224871.9348	100	Sussex
Franklin	352024.1379	100	Warren
Glassboro	202028.9314	76	Gloucester
Harrison	368918.1579	200	Gloucester
Woodbury Heights	200811.5385	77	Gloucester
Kearny	372438.5870	100	Hudson

Kearny	372438.5870	100	Hudson
Clinton	344883.3333	118	Hunterdon
Flemington	309375.0000	82	Hunterdon
Raritan	334429.7200	200	Somerset
Union	345092.6902	100	Union
Hightstown	242469.5250	91	Mercer
Dunellen	300873.7595	100	Middlesex
East Brunswick	371686.1304	100	Middlesex
Edison	394132.8432	100	Middlesex
Highland Park	353850.0000	100	Middlesex
Middlesex	304125.9762	83	Middlesex
Milltown	353829.4118	100	Middlesex
New Brunswick	318155.3516	100	Middlesex
North Brunswick	318347.4698	100	Middlesex
Old Bridge	358597.3683	96	Middlesex
Perth Amboy	288998.0952	100	Middlesex
Piscataway	351443.8525	100	Middlesex
Sayreville	328016.2481	100	Middlesex
South Plainfield	352514.3173	83	Middlesex
South River	316610.8696	100	Middlesex
Woodbridge	305731.7153	100	Middlesex
Freehold	288321.6667	200	Monmouth
Hazlet	350855.3846	100	Monmouth
Howell	377876.9916	83	Monmouth
Keyport	277240.0000	100	Monmouth
Millstone	309250.0000	188	Somerset
Butler	347620.1724	100	Morris
Riverdale	321448.2759	100	Morris
Brick	340385.4507	94	Ocean
Pine Beach	361748.8788	100	Ocean
Seaside Heights	253287.6939	80	Ocean

Bloomington	332538.0941	100	Passaic
Clifton	378157.2926	100	Passaic
Haledon	329518.5714	100	Passaic
Hawthorne	398396.5909	87	Passaic
Little Falls	387043.1000	92	Passaic
Passaic	331496.6095	100	Passaic
Paterson	310259.4565	100	Passaic
Bound Brook	326448.1481	99	Somerset
Somerville	339146.0526	84	Somerset
Elizabeth	339461.9002	100	Union
Hillside	302437.6923	100	Union
Kenilworth	373889.1045	100	Union
Linden	321751.7944	100	Union
Plainfield	298380.3061	92	Union
Rahway	292212.8372	100	Union
Roselle	268035.3500	100	Union
Roselle Park	305487.1261	100	Union

Cluster C Rec. – Min Price, Max Venue

- Cluster C: Cluster C consists of Counties which house houses priced between \$200,000 and \$400,000 and maximizes the venue counts in a 5 mile radius from each town.
- This makes up the second most majority of NJ and is distributed all throughout NJ. There are repeats of counties here, but there are more expensive towns within the same county.
- The median house prices in this cluster are \$464,766 and a mean of \$473,477 with a \$53,000 Standard Deviation.

	Avg Sale Price	Venue
County		
Hunterdon	422045.952950	159.000000
Passaic	442781.825750	97.000000
Somerset	447745.312500	86.000000
Bergen	462721.006048	97.655172
Hudson	464103.134067	115.333333
Middlesex	470645.919700	100.000000
Union	473617.524917	98.166667
Morris	486824.511614	110.285714
Ocean	487820.065800	88.500000
Monmouth	488449.655157	126.000000
Burlington	505679.597400	91.000000
Essex	510335.876633	93.500000
Camden	553345.274300	100.000000

Cluster C Town Recommendation

Cleaned City	Avg Sale Price	Venue
Bergenfield	417595.4444	100
Carlstadt	433240.0000	100
Cliffside Park	479492.7012	100
Dumont	416009.5584	100
Emerson	500459.3750	100
Englewood	528094.0682	91
Fairview	411477.2727	100
Fort Lee	538054.7354	100
Hillsdale	502376.1463	100
Leonia	541650.7143	100
Lyndhurst	408269.7183	100
Mahwah	524545.4780	100
Maywood	420146.8493	100
Midland Park	467752.5962	100
Moonachie	441666.6667	100
New Milford	433716.3043	100
North Arlington	409210.5263	100
Northvale	483787.8378	77
Oradell	552360.0625	80
Park Ridge	557903.0562	96
Ridgefield	495748.4848	100
Rochelle Park	405247.3469	100
Rutherford	451802.7062	100
Saddle Brook	423091.4286	100
Teaneck	441417.1028	100
Waldwick	463215.2542	88
Wallington	402051.2821	100
Westwood	451511.4583	100

Wood Ridge	417015.0000	100	Bergen
Moorestown	505679.5974	91	Burlington
Springfield	438795.0867	100	Union
Haddonfield	553345.2743	100	Camden
Fairfield	523807.1429	93	Essex
Cedar Grove	502501.9307	100	Essex
Maplewood	588843.7570	100	Essex
Roseland	549585.2941	89	Essex
Verona	471517.6220	100	Essex
West Orange	425759.5131	79	Essex
Harrison	575600.0000	200	Hudson
Bayonne	409113.5057	92	Hudson
Jersey City	508691.1941	100	Hudson
North Bergen	420117.6101	100	Hudson
Secaucus	459904.1976	100	Hudson
Union City	411192.2969	100	Hudson
Clinton	437938.2075	118	Hunterdon
Raritan	406153.6984	200	Hunterdon
Metuchen	470645.9197	100	Middlesex
Asbury Park	412867.0455	100	Monmouth
Belmar	551266.9643	100	Monmouth
Freehold	430096.0922	200	Monmouth

Long Branch	542441.1765	100	Monmouth
Middletown	466762.3784	100	Monmouth
Millstone	587964.3678	188	Monmouth
Red Bank	427749.5614	94	Monmouth
Boonton	408637.1548	152	Morris
Boonton	567888.1818	152	Morris
Chester	464723.4286	96	Morris
Denville	474683.0969	100	Morris
East Hanover	514290.2439	100	Morris
Morris Plains	503695.2935	82	Morris
Pequannock	473874.1818	90	Morris
Island Heights	451652.6316	86	Ocean
Seaside Park	523987.5000	91	Ocean
Totowa	420797.2545	97	Passaic
Wayne	464766.3970	97	Passaic
Bridgewater	447745.3125	86	Somerset
Clark	455331.1000	89	Union
Cranford	497696.7978	100	Union
Fanwood	490089.7073	100	Union
Garwood	428888.1875	100	Union
Scotch Plains	530904.2702	100	Union

Cluster D Rec. – Min Price, Max Venue

- Cluster D: Cluster D consists of Counties which house houses priced between \$600,000 and \$850,000 and maximizes the venue counts in a 5 mile radius from each town.
- The median house prices in this cluster are \$710,239 and a mean of \$712,002 with a \$70,000 Standard Deviation.

County	Avg Sale Price	Venue
Monmouth	682523.237967	114.5
Bergen	682811.480410	99.6
Somerset	685200.000000	80.0
CapeMay	687965.152700	92.0
Union	713750.131750	82.0
Essex	748044.735350	100.0
Middlesex	758323.000000	100.0
Morris	777310.255680	116.4
Hudson	807229.013800	100.0

Cleaned City	Avg Sale Price	Venue	County
Allendale	767248.4848	100	Bergen
Edgewater	800201.2892	100	Bergen
Glen Rock	659864.2478	100	Bergen
Jarrington Park	675482.3659	100	Bergen
Haworth	702390.3846	100	Bergen
Montvale	644095.3333	100	Bergen
Norwood	626394.5179	97	Bergen
Palisades Park	718089.4737	100	Bergen
Paramus	740036.2069	100	Bergen
Woodcliff Lake	694312.5000	99	Bergen
Cape May	741125.1462	84	CapeMay
Ocean City	634805.1592	100	CapeMay
Glen Ridge	769945.9101	100	Essex
Montclair	726143.5606	100	Essex
Hoboken	807229.0138	100	Hudson
Cranbury	758323.0000	100	Middlesex
Bradley Beach	672466.6667	100	Monmouth
Brielle	632900.0000	100	Monmouth
Little Silver	748982.9787	99	Monmouth
Manasquan	805730.1765	100	Monmouth
Oceanport	605328.5714	88	Monmouth
Shrewsbury	629731.0345	200	Monmouth
Chatham	816300.0000	200	Morris
Chester	693526.4868	96	Morris
Florham Park	743309.6154	100	Morris
Madison	810586.5333	86	Morris
Mountain Lakes	822828.6429	100	Morris
Watchung	685200.0000	80	Somerset
Mountainside	623233.9612	79	Union
Westfield	804266.3023	85	Union

Cluster E Rec. Min Price, Max Venue

- Cluster E: Cluster E consists of Counties which house prices above \$850,000 and maximizes the venue counts in a 5 mile radius from each town.
- There are repeats of counties here, but there are more expensive towns within the same county.
- The median house prices in this cluster are \$1,063,323 and a mean of \$1,204,870 with a \$660,000 Standard Deviation.

	Avg Sale Price	Venue
County		
Union	1.038972e+06	100.000
Mercer	1.039751e+06	82.000
Morris	1.063323e+06	200.000
Essex	1.120802e+06	100.000
Bergen	1.188781e+06	96.375
Monmouth	1.355091e+06	92.000
CapeMay	1.523616e+06	77.000

Cleaned City	Avg Sale Price	Venue	County
Alpine	2.489375e+08	83	Bergen
Cresskill	8.890314e+05	100	Bergen
Demarest	1.084515e+08	97	Bergen
Englewood Cliffs	1.337534e+08	100	Bergen
Ridgewood	8.522472e+05	100	Bergen
Saddle River	1.988882e+08	91	Bergen
Tenafly	9.308590e+05	100	Bergen
Teterboro	0.000000e+00	100	Bergen
Stone Harbor	1.523818e+08	77	CapeMay
Essex Fells	9.731500e+05	100	Essex
Millburn	1.288455e+08	100	Essex
Princeton	1.039751e+08	82	Mercer
Deal	0.000000e+00	78	Monmouth
Sea Girt	2.182083e+08	100	Monmouth
Spring Lake	1.903190e+08	100	Monmouth
Chatham	1.083323e+08	200	Morris
Summit	1.038972e+08	100	Union



Thank You