

# Homework 3 - 2018 Housing Prices in CT

Jack Bienvenue

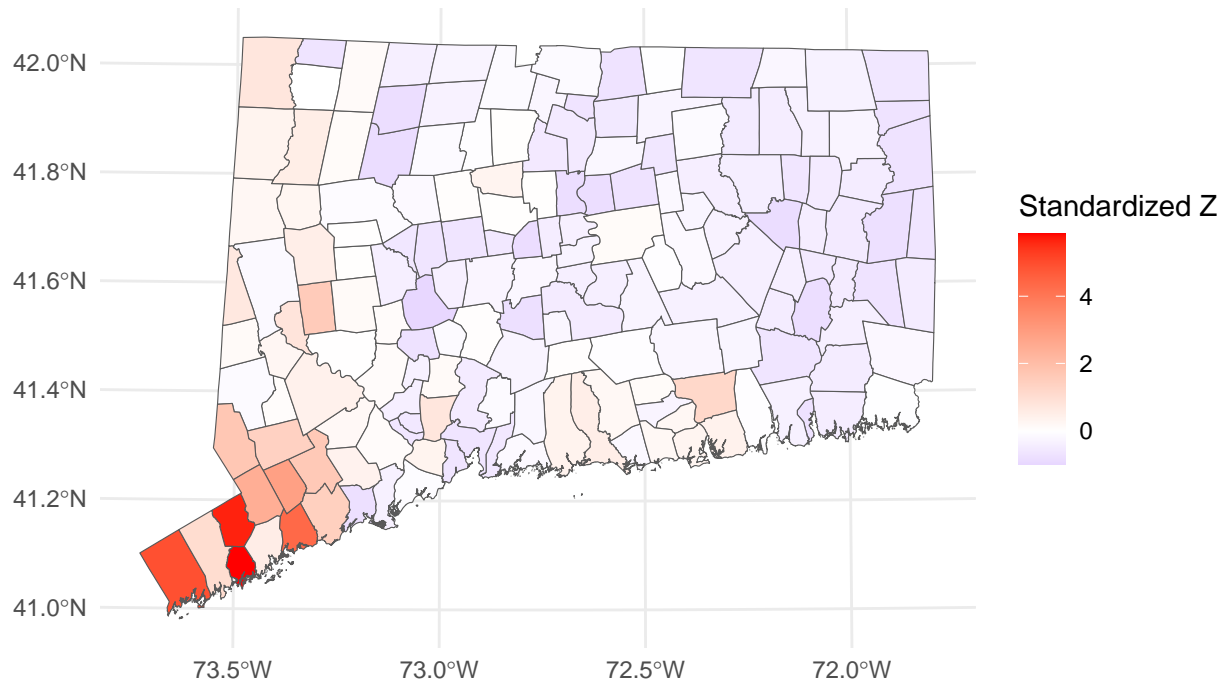
12 September 2025

## Task 1: Replicating CT Home Value Map

To replicate the plot for Task 1, we will have to start by obtaining Z-scores for the median home value of each town. After that, we will merge the data sets. At last we will reproduce the map, which we can view below:

### Standardized Median Home Value (Z-scores)

Z = 0 is the statewide average; red = above, blue = below



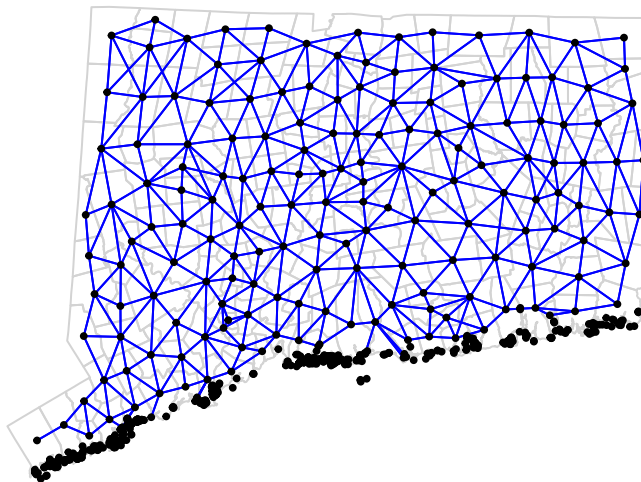
Question: What can you say about the home values in CT?

We can see easily in our map that there is a concentration of high median home values for towns in Southwestern Connecticut—the corner of the state closest to New York City. We see high home values in a few other enclaves, including around Lyme, Connecticut (which is near major, lucrative employers Pfizer, Electric Boat, US Coast Guard Academy, and Dominion Energy) and along the western border of the state, where country homes for wealthy vacation home owners are located. We see that the inland, eastern portion of the state generally possesses lower-than-median home values. We also see bands of lower-than-median home value towns in the central-western portion of the state and around New Haven, CT. This plot does not provide information about absolute-scale median home prices.

## Task 2: Replicating Moran's I Scatterplot

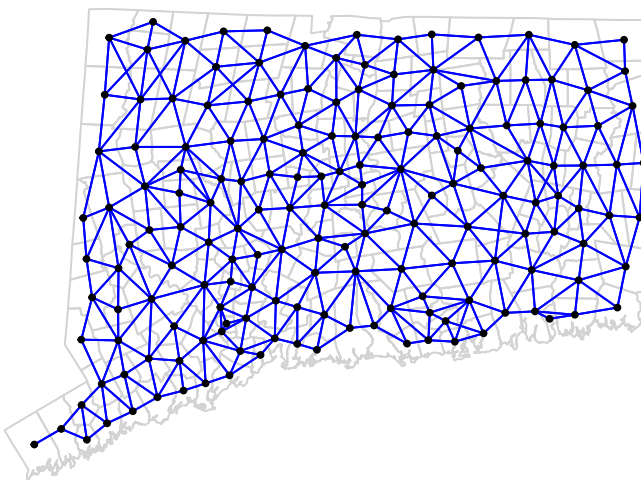
Replicating this plot takes a little bit more behind-the-scenes magic. Specifically—we run into a problem with the fact that Connecticut's geometries for its towns in the shapefiles I used are *multipolygons*. These multipolygons are used in Connecticut specifically to include outlying islands that belong to Connecticut towns. Below, see how we must implement a method to remove these islands for proper neighbor-matching to get an accurate Moran's I scatterplot.

### CT Town Neighbors



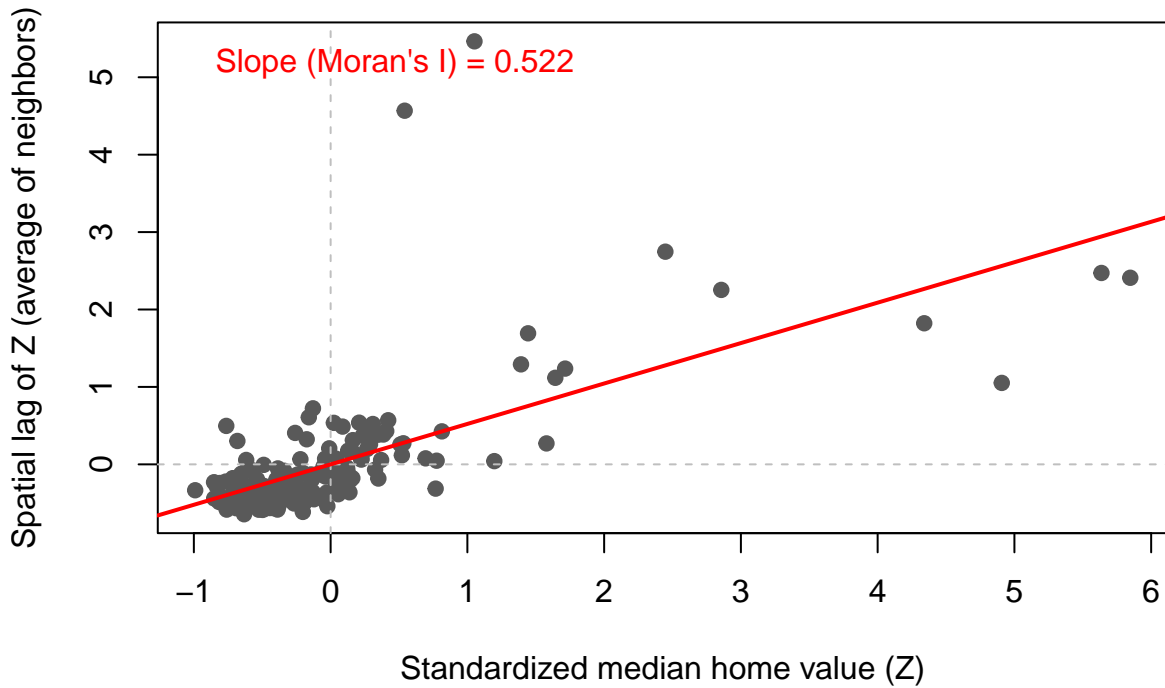
We notice along that we have a large number of unmatched islands littering the coastline. These will be factored into the Moran's I calculation, and interfere with our results later. We must remove these polygons from the multipolygon town geometries. We do not lose information for this particular analysis by doing this, as the median home value for each town is still preserved (and those medians include islands' homes).

### CT Town Neighbors – Mainlands Only



We were successful in removing the islands from the town geometries. Now, we can proceed to building the Moran's I scatterplot.

## Moran Scatterplot -- CT Median Home Values



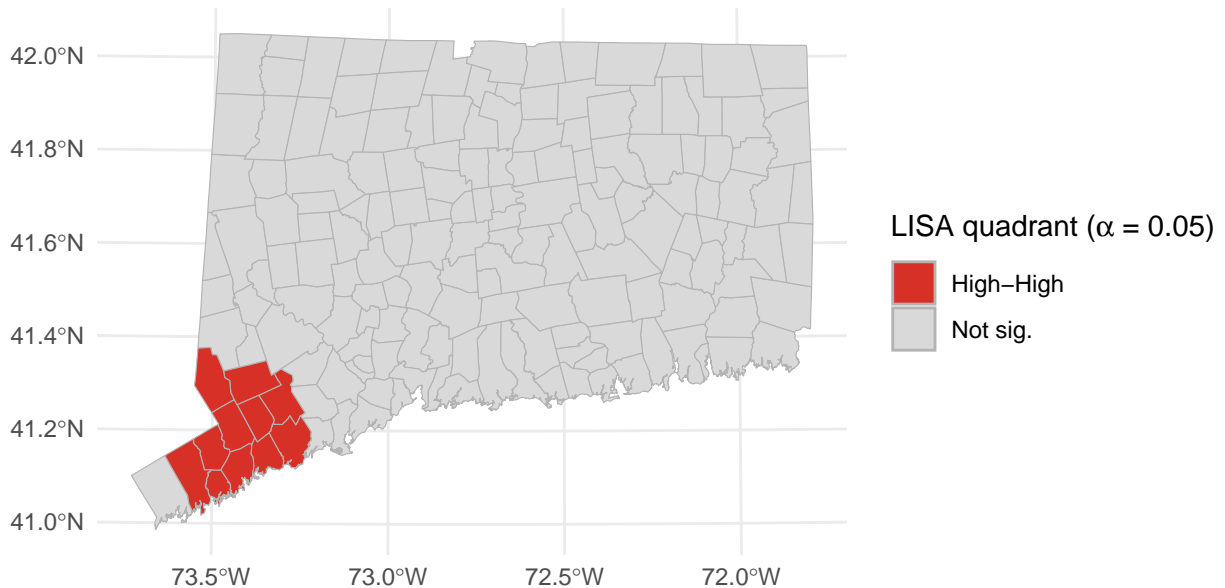
Question: What can you say about the spatial autocorrelation of home values in CT?

After some important spatial manipulation to the data to remove islands, we are able to obtain an accurate scatterplot of the average Z-scores of a town's neighbors to its own Z-score for median home value in the set of Connecticut towns. With a Moran's I of 0.522, we see that neighboring towns' median home value fluctuates together in a fairly strong manner. This is indicative of clustering of similar values for median home value. On the ground, when combined with our map, this tells us that there are likely some different economic enclaves (groups of towns with different wealth concentration levels) in the state.

### Task 3: Replacing Spatial Clustering Map

#### Local Moran's I – CT Median Home Values

Standardized values (Z-scores); queen contiguity, row-standardized weights



Question: What can you say about the spatial clustering of housing prices in CT? Why do High-High clusters appear in the southwest part of the state?

The clustering as shown illuminates the fact that some towns of Southwestern Connecticut—in particular, a subset of Fairfield County's towns—have high average home values, and their neighboring towns do as well. These towns are known to be sites of generational wealth, and are closer in proximity to the major wealth and employment center that is New York City.

We notice an absence of the other cluster types. It would be interesting to examine if this absence of other clusters is still the case for the subset of Connecticut towns excluding Fairfield County. In addition, we notice an artifact of using our neighbor method without including bordering towns from other states. Greenwich (seen in the Southwesternmost corner in gray), one of Connecticut highest-median-home-value towns, is not included in the High-High cluster.

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Thank you! Have a great day. - Jack