

Relationship between venue types and house prices in Perth, WA

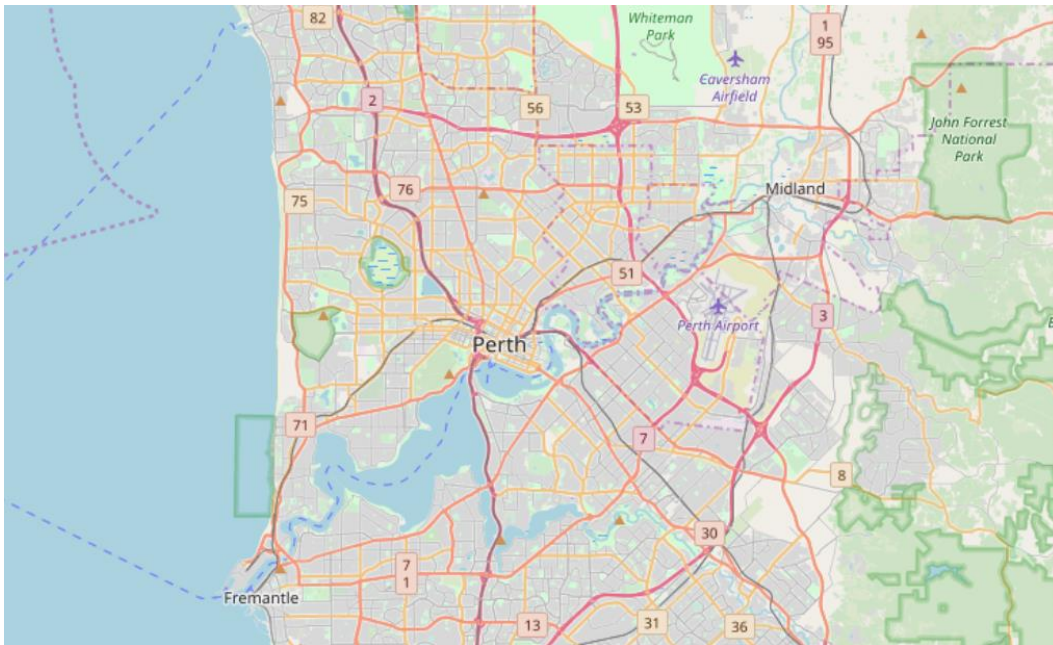
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Understanding venue type – house price relationship is beneficial

- help **predict house prices**
- help **adjust the housing market** by adjusting the policies to different venues
- help **find the most potential suburbs** to have a growing housing market this year, by looking for the suburbs with a “right” composition of local venues.



Perth has 355 suburbs, with different venue compositions and house prices



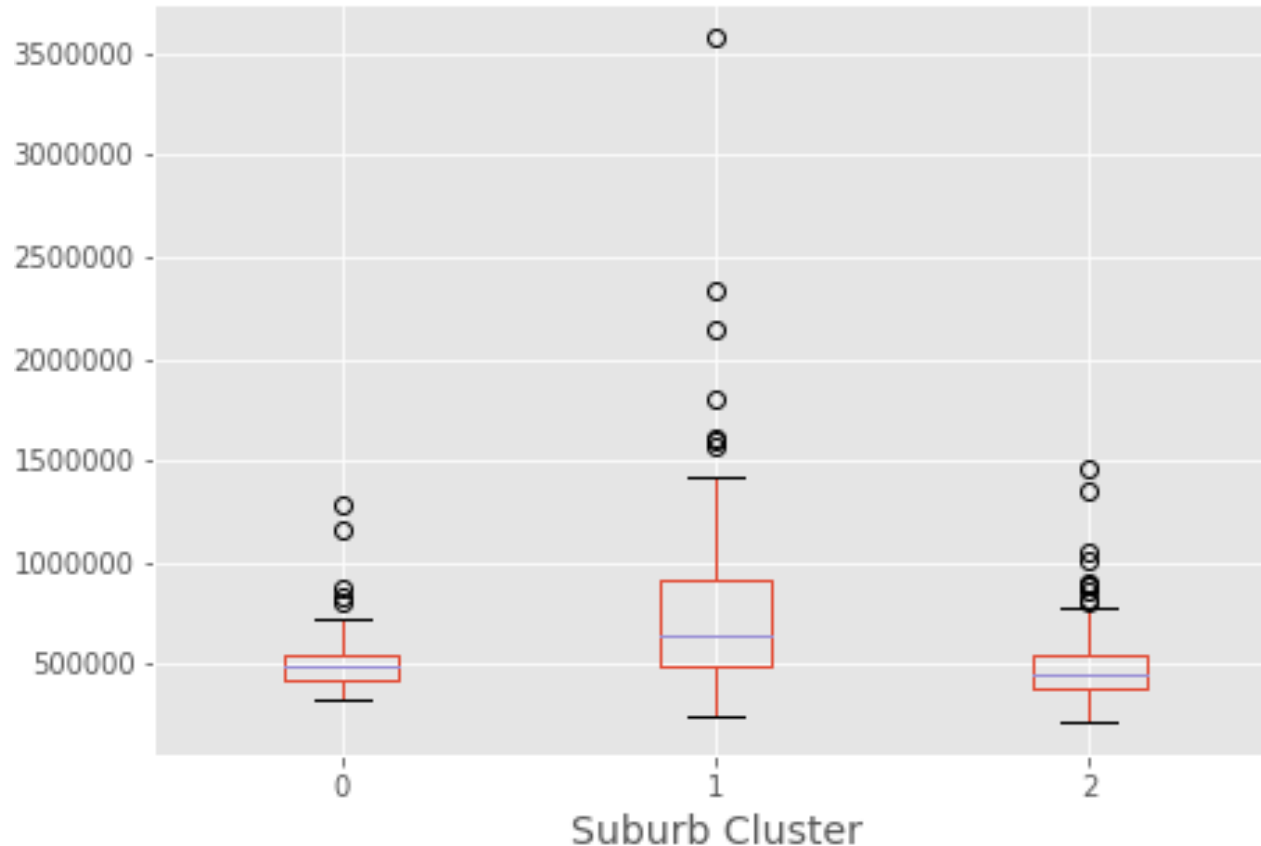
Data acquisition and cleaning

- Housing prices for 2018 scraped from reiwa.com.
- Geological information scraped from [Postcodes Australia](#) and Wikipedia.
- Venue information pulled from [Foursquare API](#).
- Suburbs with missing house prices, or missing venue data were dropped
- After data cleaning:
 - 297 suburbs' house price and venue data
 - 281 venues categories
 - 285 suburbs have information of their distances to the nearest urban center, airport and train station



Suburbs were clustered by venue compositions

Medium House Prices Grouped by Suburb Cluster



Feature venues:

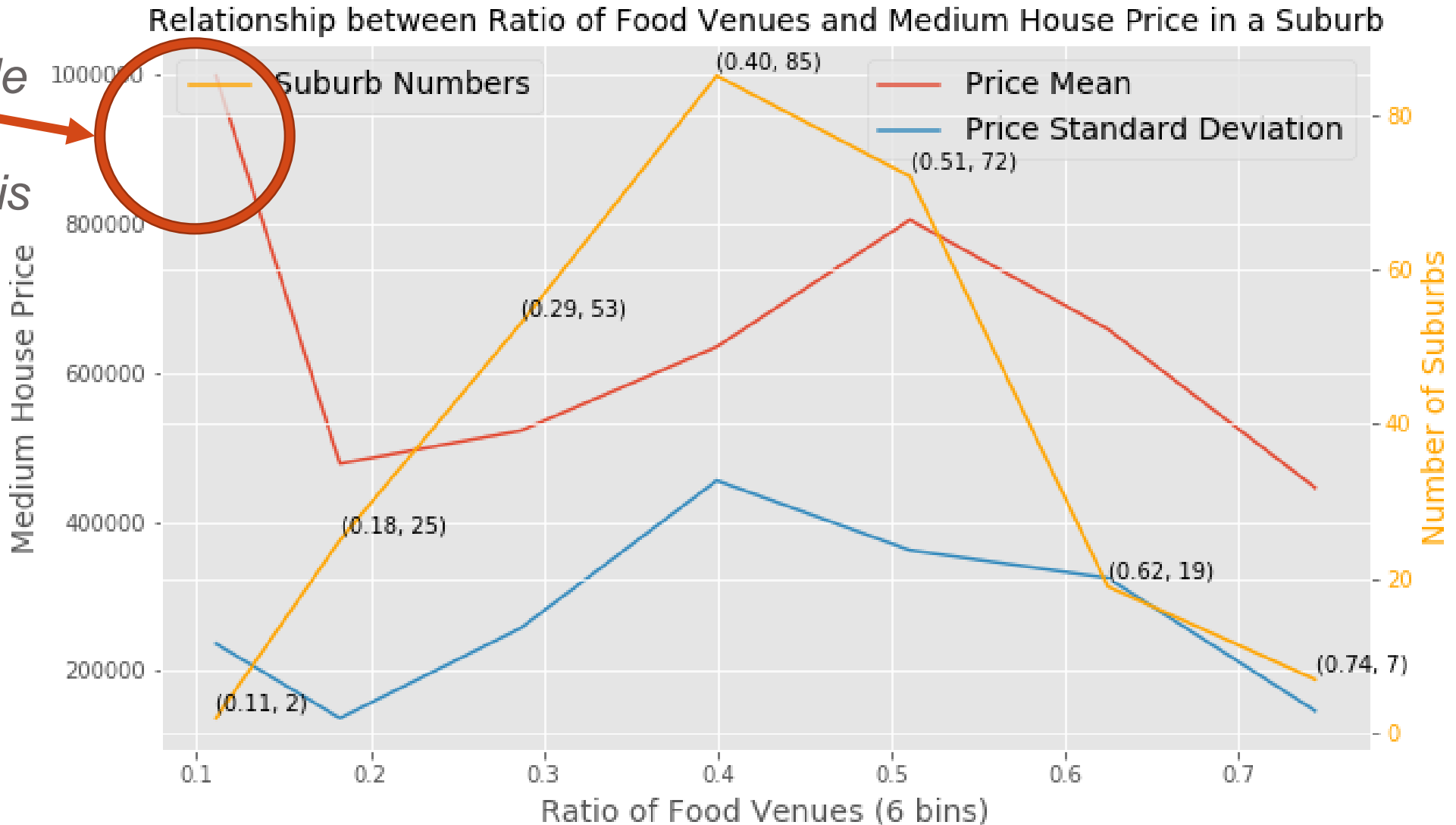
- Cluster 0: nature, stores and alcohol
- Cluster 1: food, stores and alcohol
- Cluster 2: stores, food and sports

This difference in prices among clusters shows there is a relationship between venue types and house prices

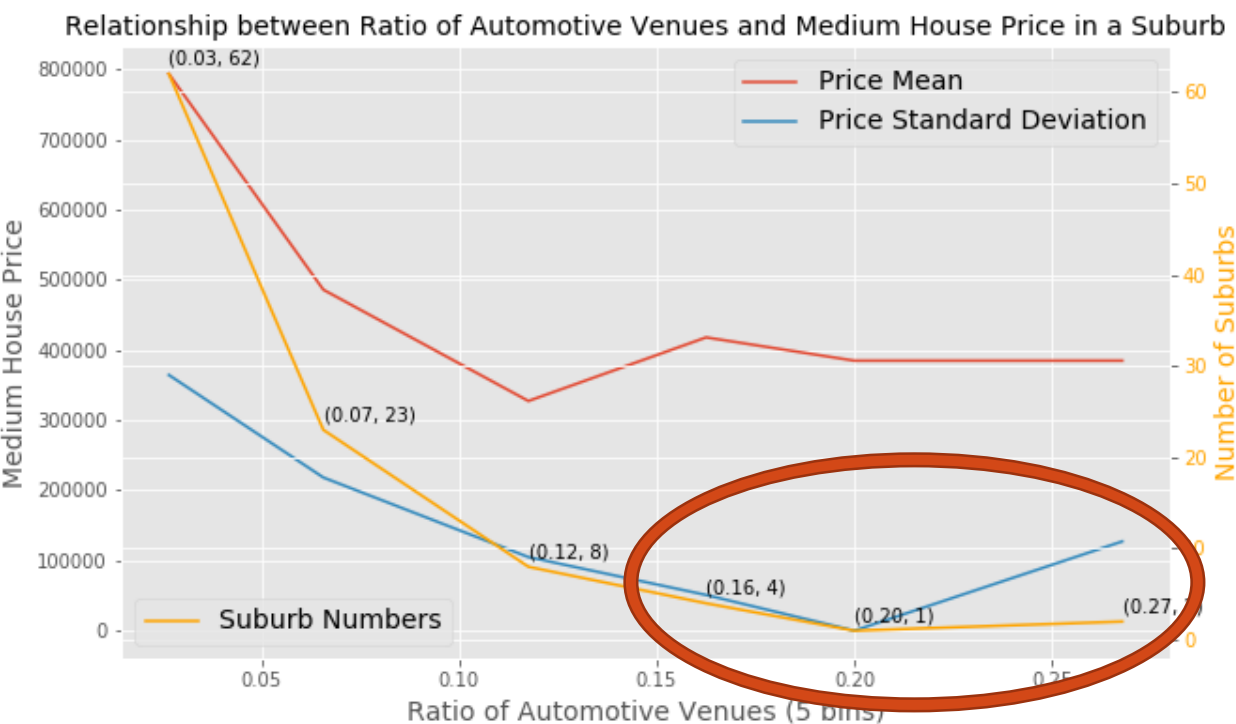


Relationship between house prices and venue ratios

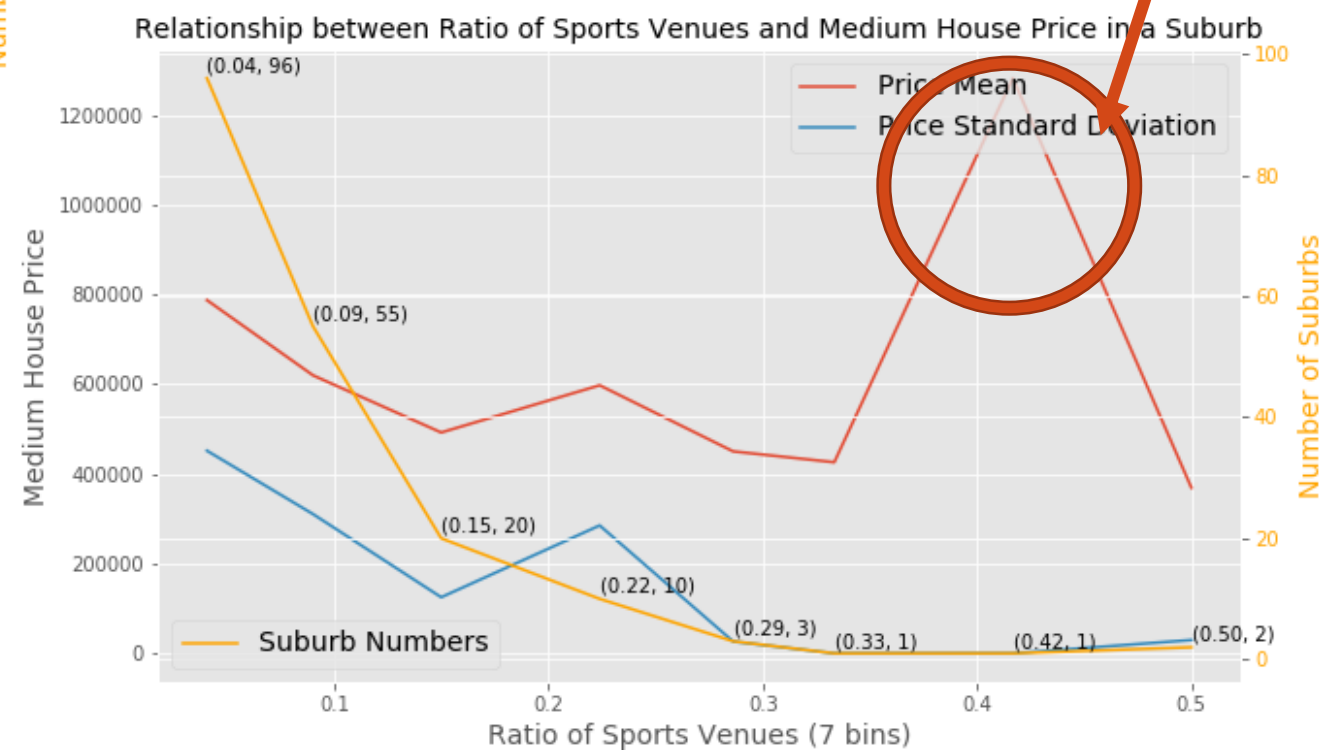
The sample size is too small at this ratio



Relationship between house prices and venue ratios



Sample size too small



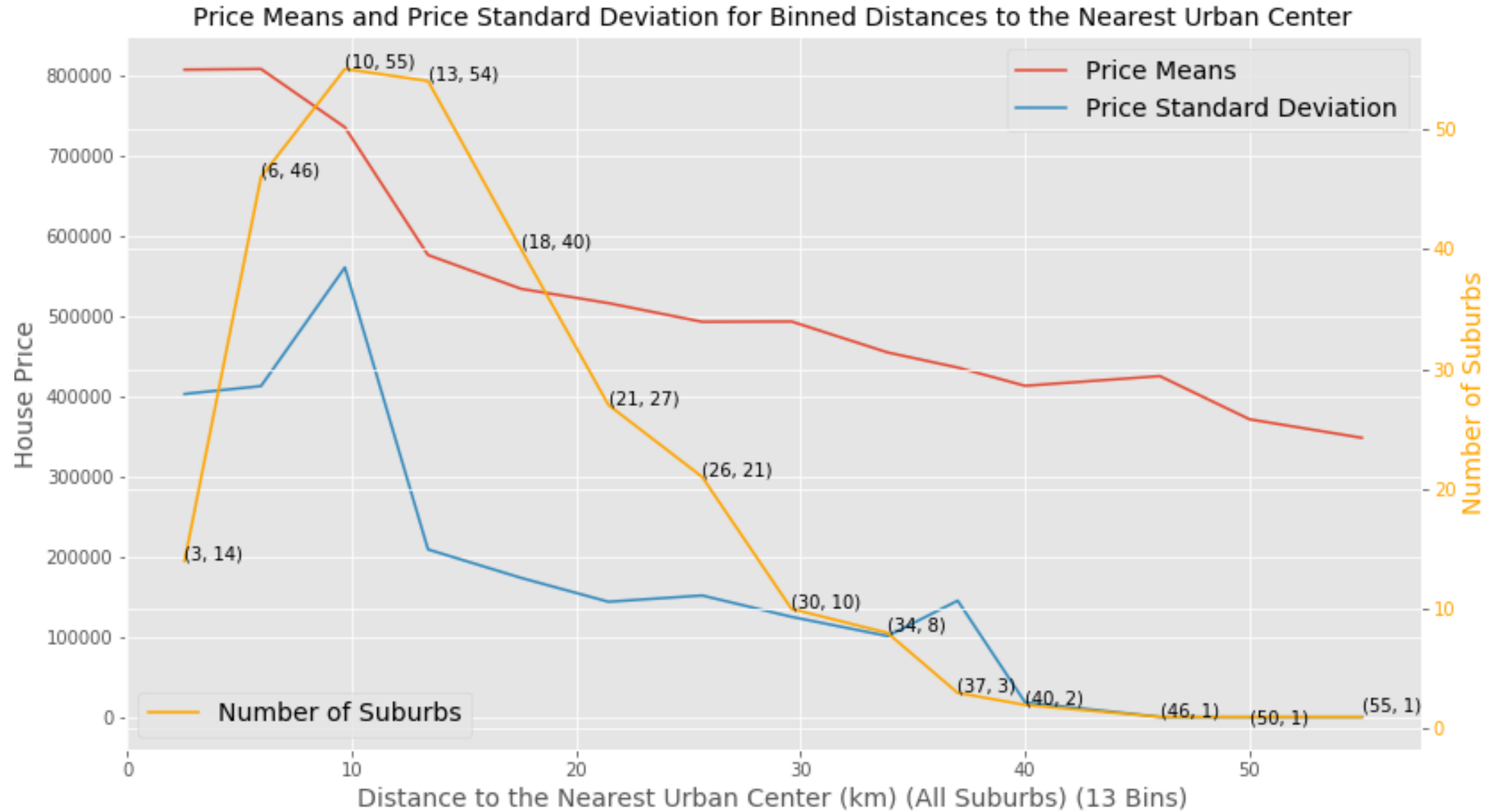
Sample size too small

Relationship between house prices and venue ratios

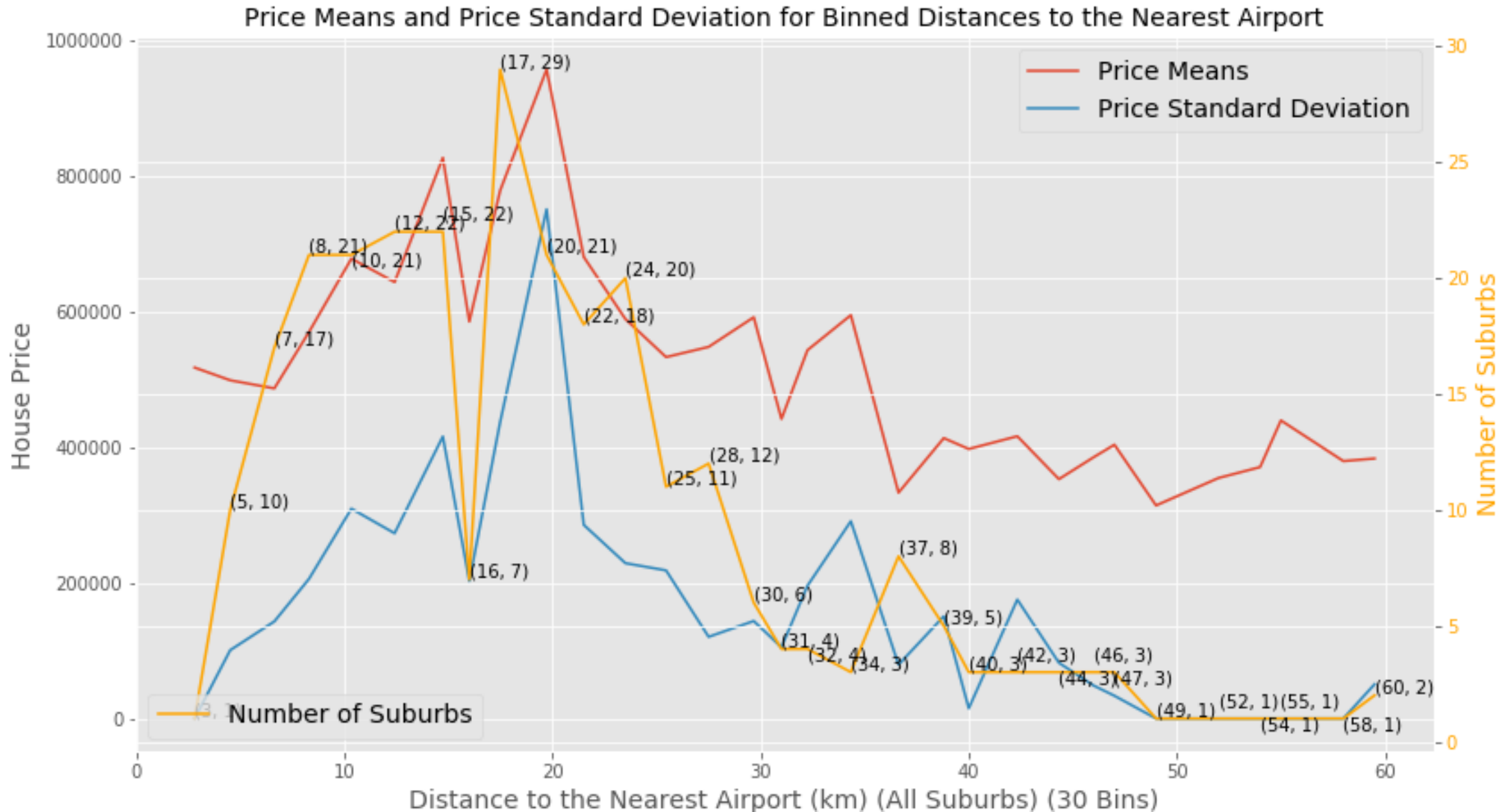
- **Having 50% venues food related makes the house prices highest:**
 - 18% - 50%: Food venue ratio $\uparrow \Rightarrow$ Non-locals served $\uparrow \Rightarrow$ Capitals attracted \uparrow
 - After 50%: Food venue ratio $\uparrow \Rightarrow$ Noise and busyness $\uparrow \Rightarrow$ Livability \downarrow
- **Higher ratios of most venue types means lower house prices**
 - Possibly because it indicates that local economy is not strong enough to have diverse venue types



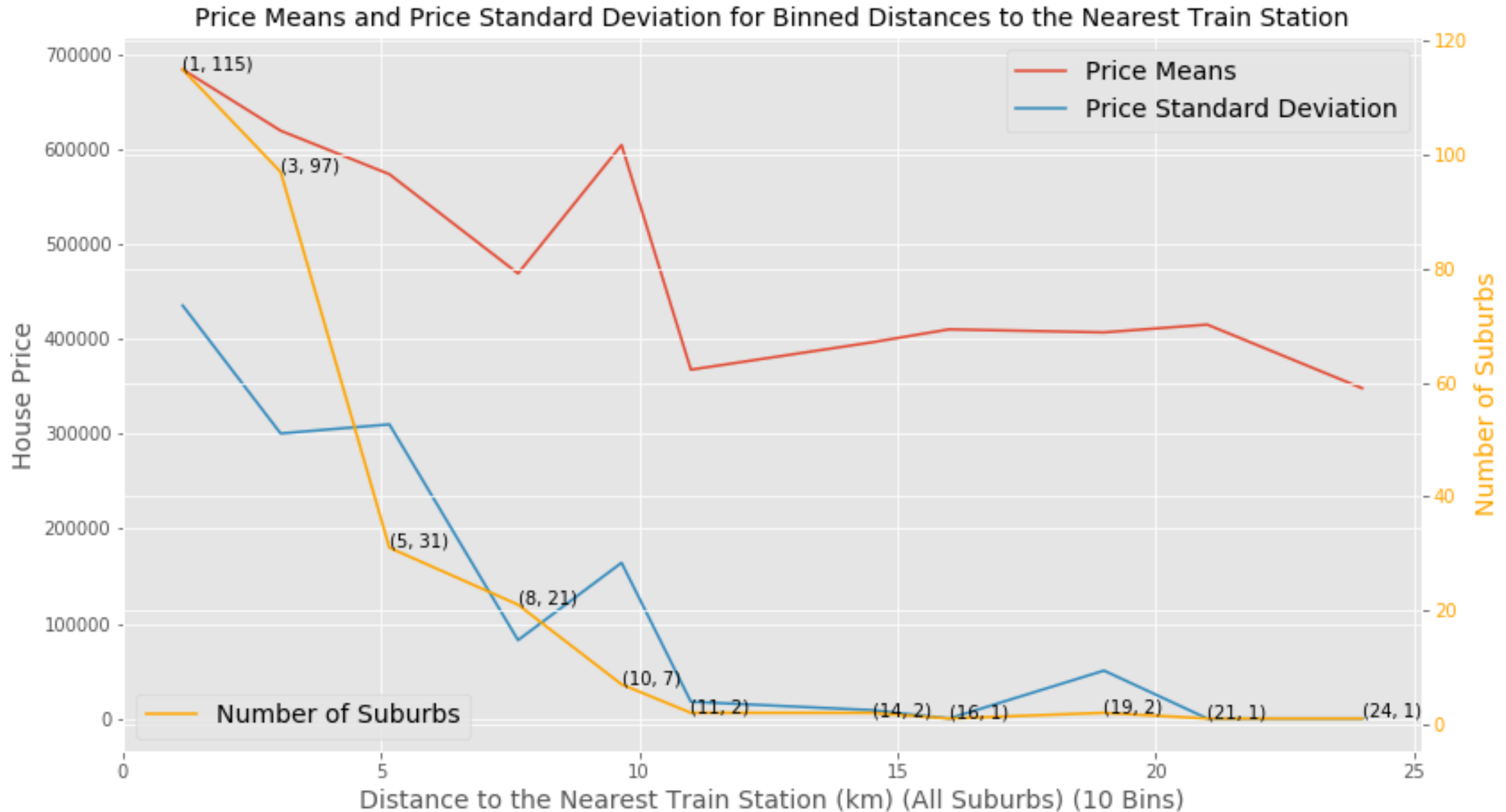
The effect of distances on house prices



The effect of distances on house prices



The effect of distances on house prices



The effect of distances on house prices



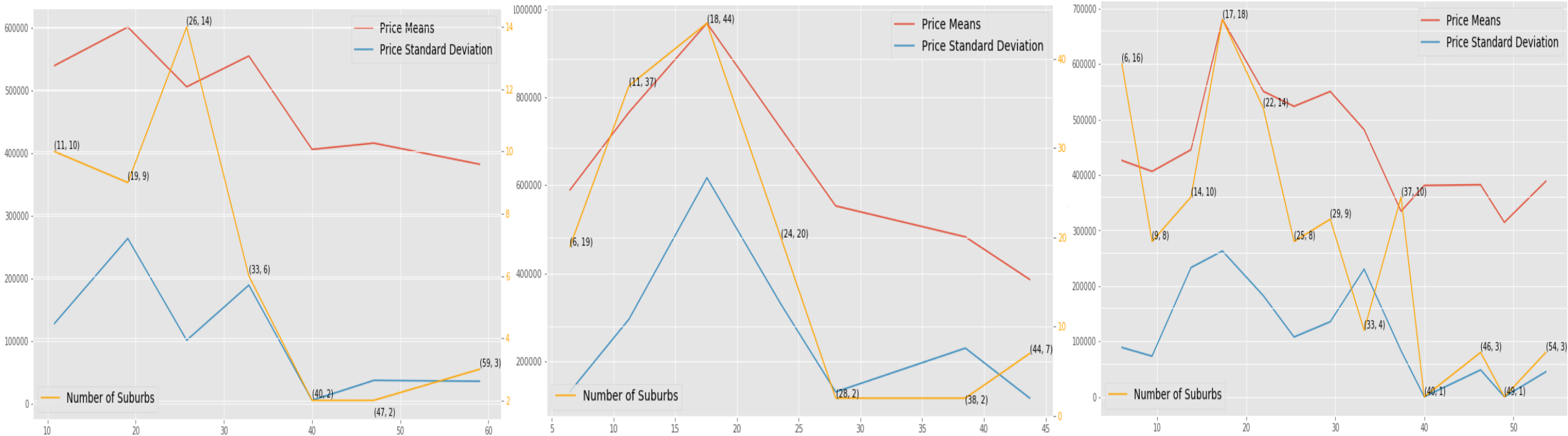
Medium house price – distance to the nearest urban center plot. Left: cluster0, middle: cluster1, right: cluster2

Cluster0: rise in average house price first as the distance to the urban center increases, and only decrease when the distance is as big as around 30 km away

Cluster1,2: have the highest average house prices when close to the urban center



The effect of distances on house prices

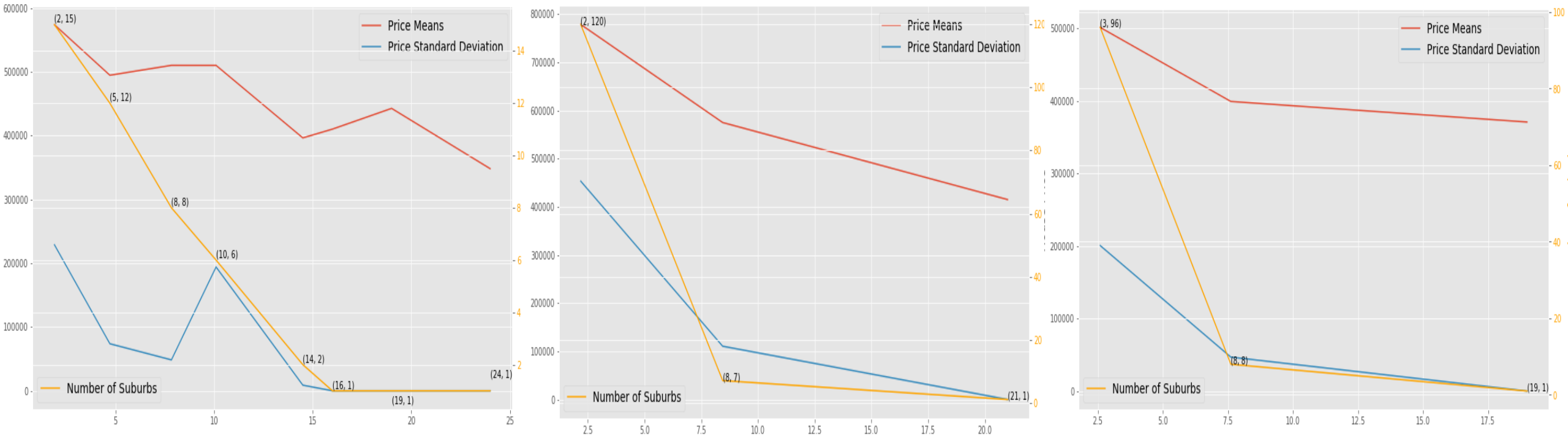


Medium house price – distance to the nearest airport plot. Left: cluster0, middle: cluster1, right: cluster2

All suburbs have the highest average house prices when they are around 18 km away from the airport, with happens to be the distance between Perth airport and the beaches.



The effect of distances on house prices

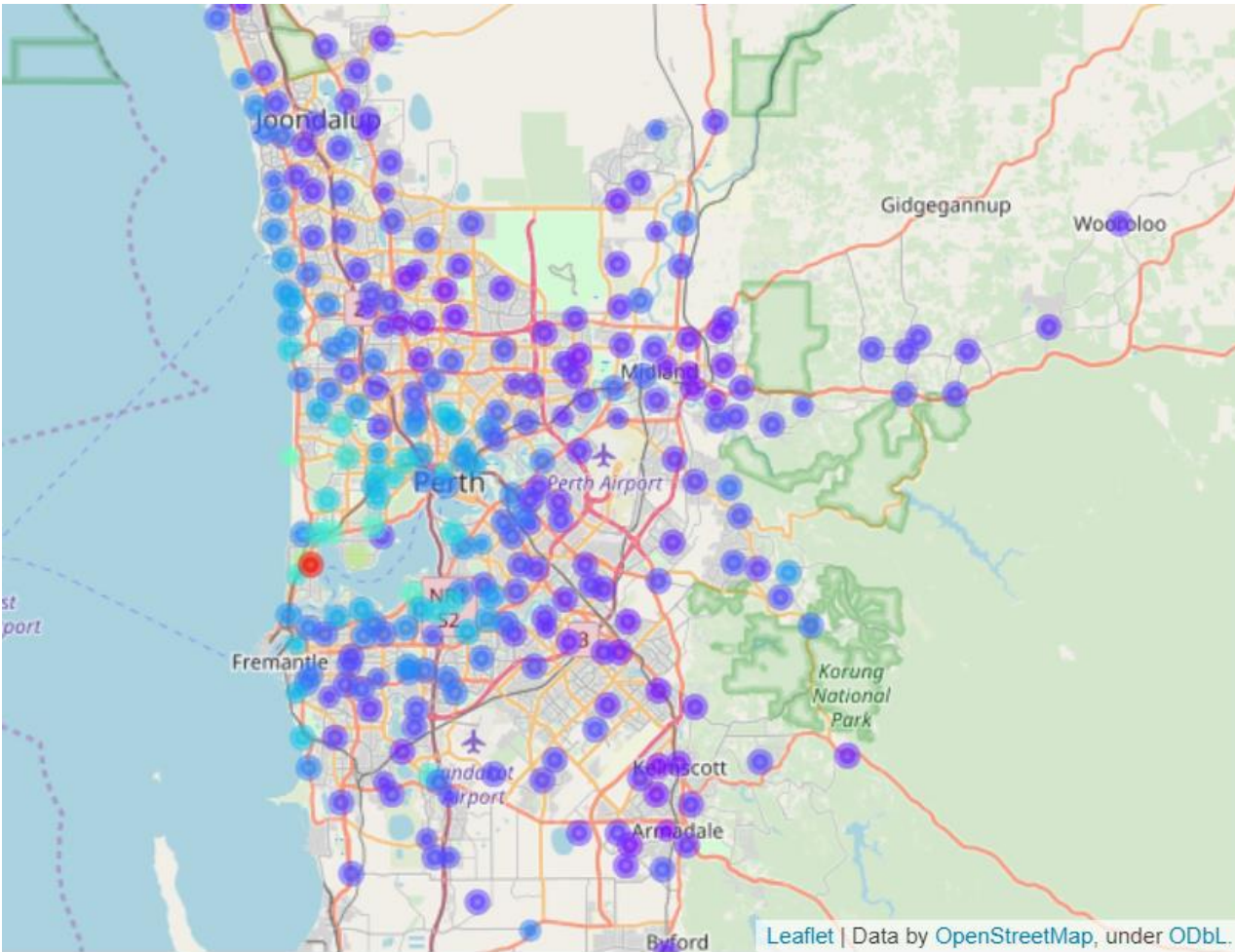


Medium house price – distance to the nearest train station. Left: cluster0, middle: cluster1, right: cluster2

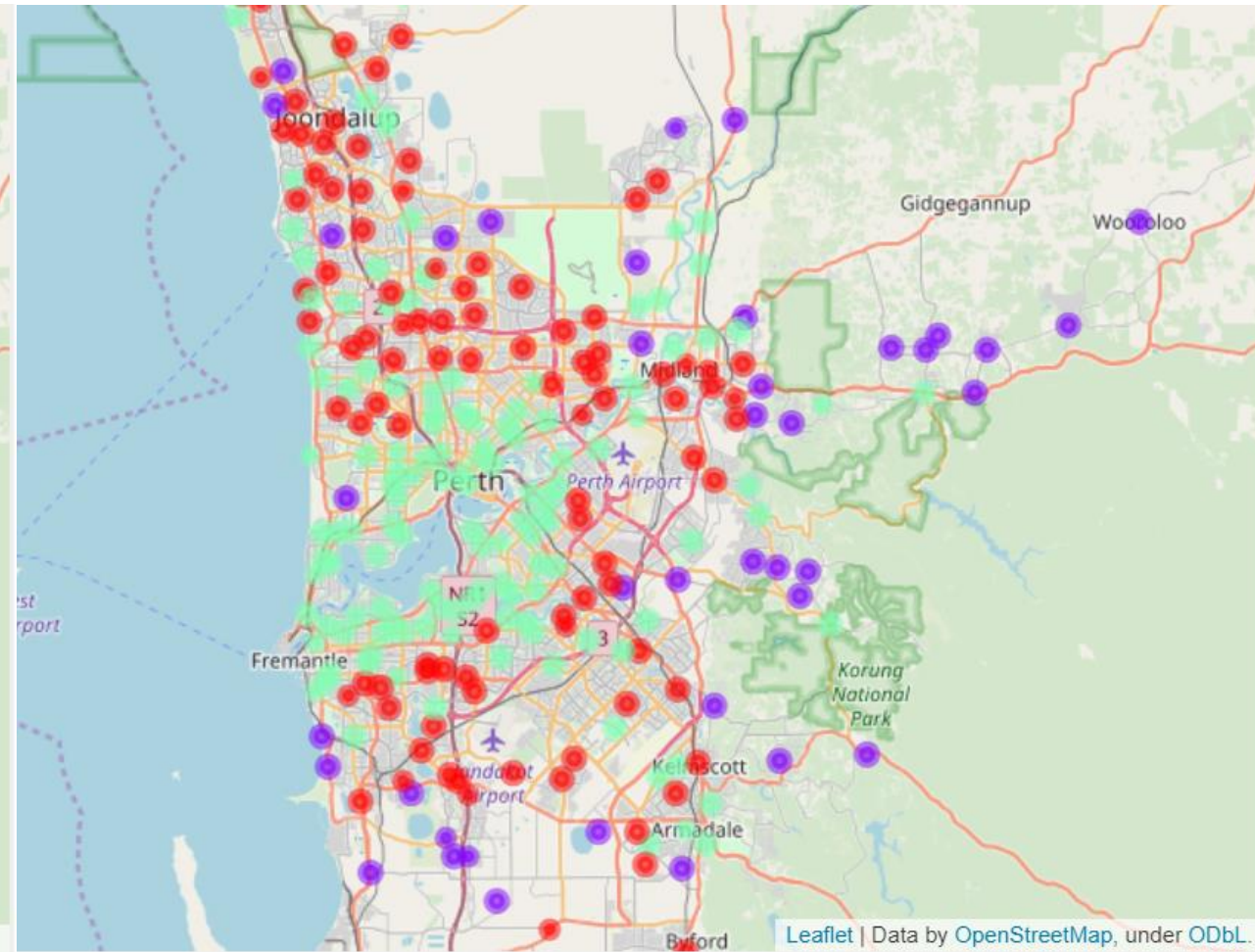
The suburbs Cluster1 and Cluster2 are mostly within 3 km from the train stations, while the Cluster0 suburbs are farther away but with their house prices less affected by this distance.



Suburbs on the map



Colors representing suburb house prices,
dark → bright: cheaper → expensive



Cluster0: purple, Cluster1: green,
Cluster2: red



Suburbs on the map

- Considering the great impact geological location has on economy, the difference in the geological distribution of the suburbs from different cluster on the map is probably suggesting that, instead of affecting house prices and local economy, venue types do a better job reflecting the local economy and hence are an **indicator of local house prices**.
- If these assumptions are true, the suburbs in the second cluster that have low house prices at the moment might be of the most potential to have a growing housing market in 2019, especially the coastal ones.



Conclusions and limits

- Proved there is a relationship between venue composition of a suburb and its house prices. Cluster1 suburbs might have more potentials in housing market
- Food venue ratio has an obvious relationship with local house prices, with 50% being the best for house prices
- Distances to the nearest urban center and nearest train station affect suburbs with different venue compositions slightly differently
- Limits:
 - Not enough venue data for some venue categories
 - Only studied the suburbs in Perth, thus may not be applicable elsewhere

