PMI Case Study #3 POS performance indicators

Analysis and recommendations
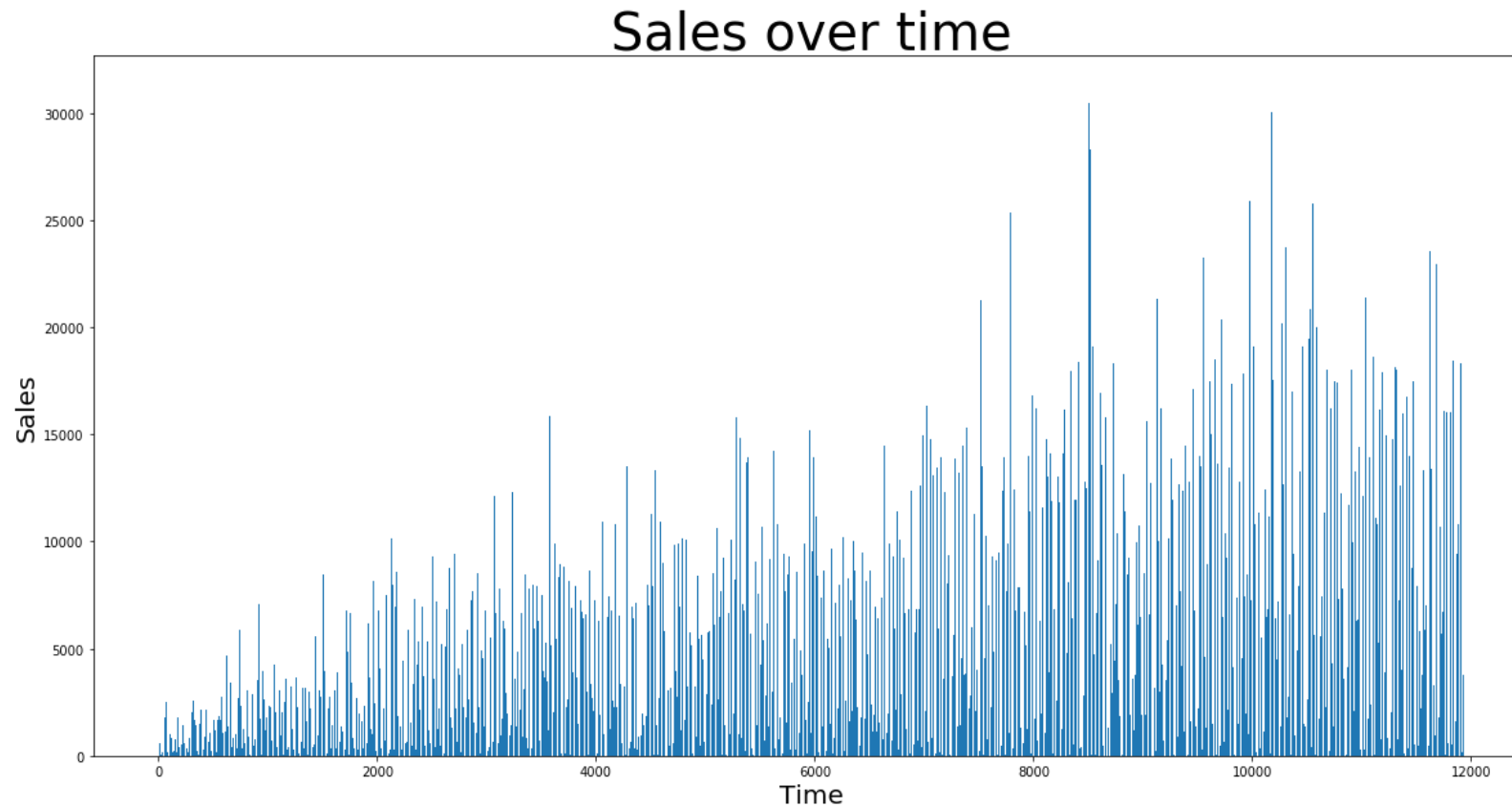
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The problem

- Given POS sales data and information about its surroundings, can we identify patterns that lead to higher performance?
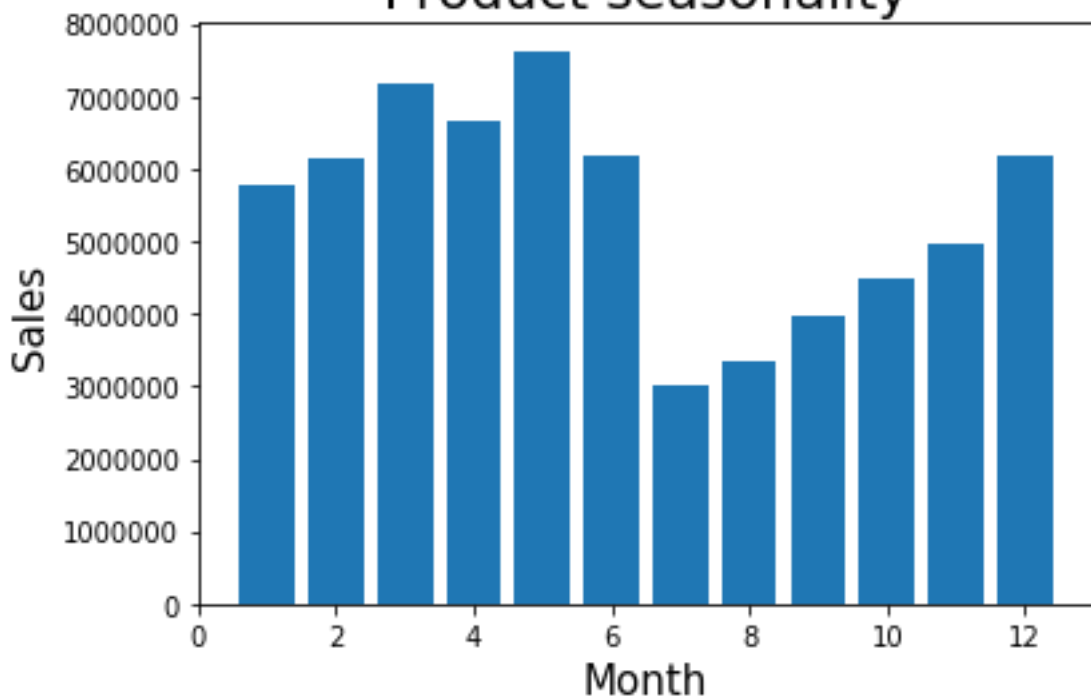
The data - sales

- About three years of sales on a hourly basis, from 2015 to 2017
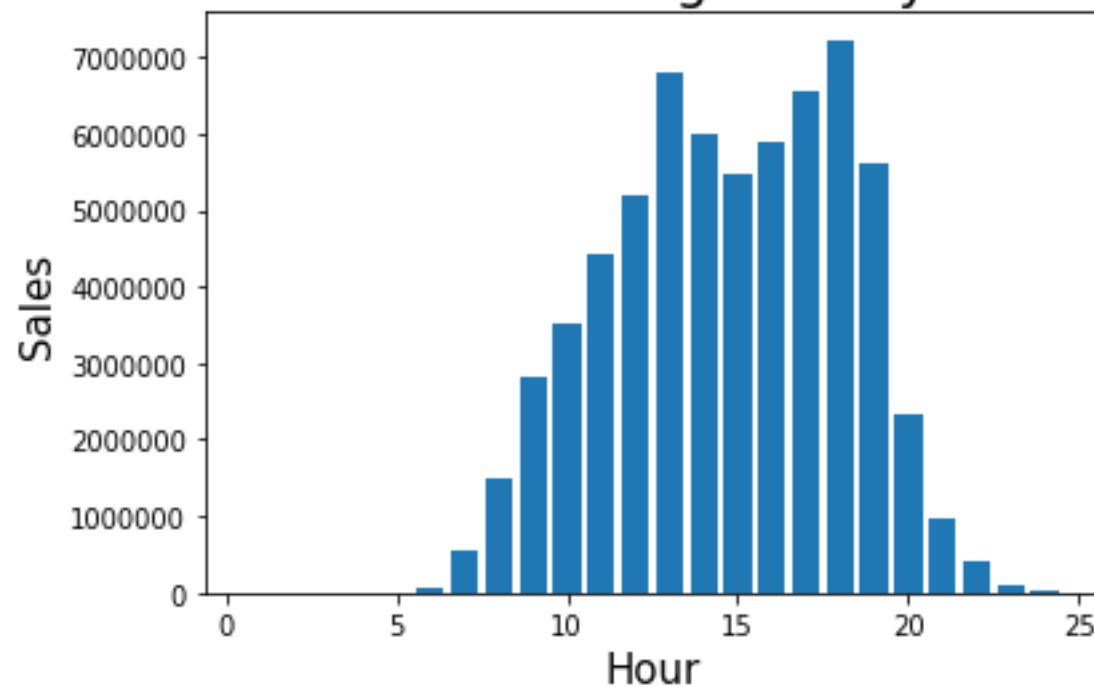
- Overall increasing trend

Sales over time

The data - sales

- Seasonal sales: Might be impacted by summer time / vacation

- Might be bought during lunch and when leaving office

Surroundings

- 90 diferente surroundings with its respective location

- New data set was produced to categorized the 90 surroundings into 5 lines of business : services, transportation, "Dring and Eat", store, recreation

Framing the problem

- My performance metric (Performance)
  - Average weighted sales
  - Normalized by how long the store is operating

$$Performance = \frac{W.AVG(Sales)}{POS\ Lifetime}$$

- Features to be analysed
  - Number of each kind of surroundings
  - Number of each kind of line of business
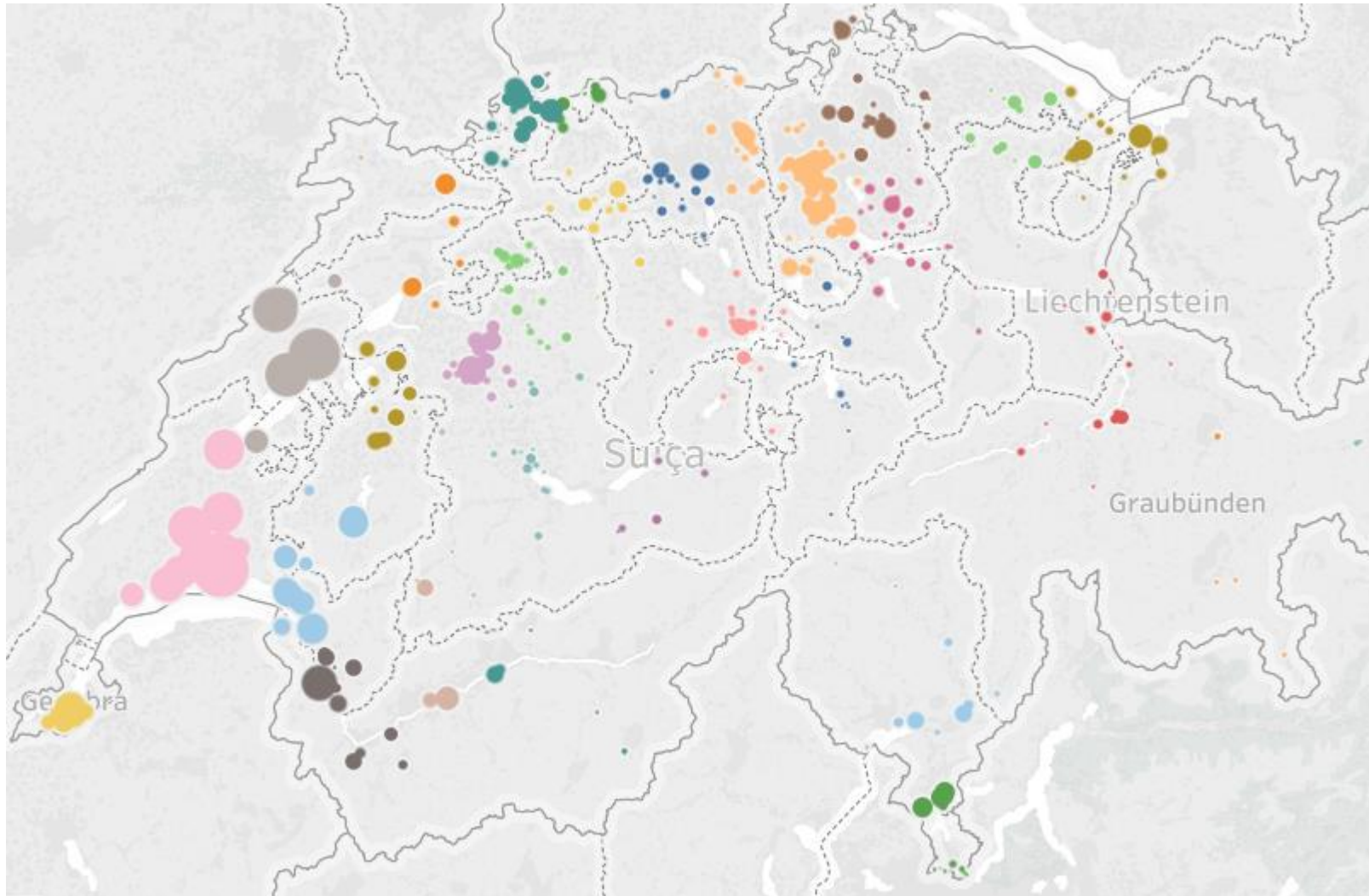 - Total number of surroundings
  - Location of POS

Impotant features – all stores

- Running Random Forest

- Longitude and latitude rank as the most important features with a combined relative importance of over 40%.

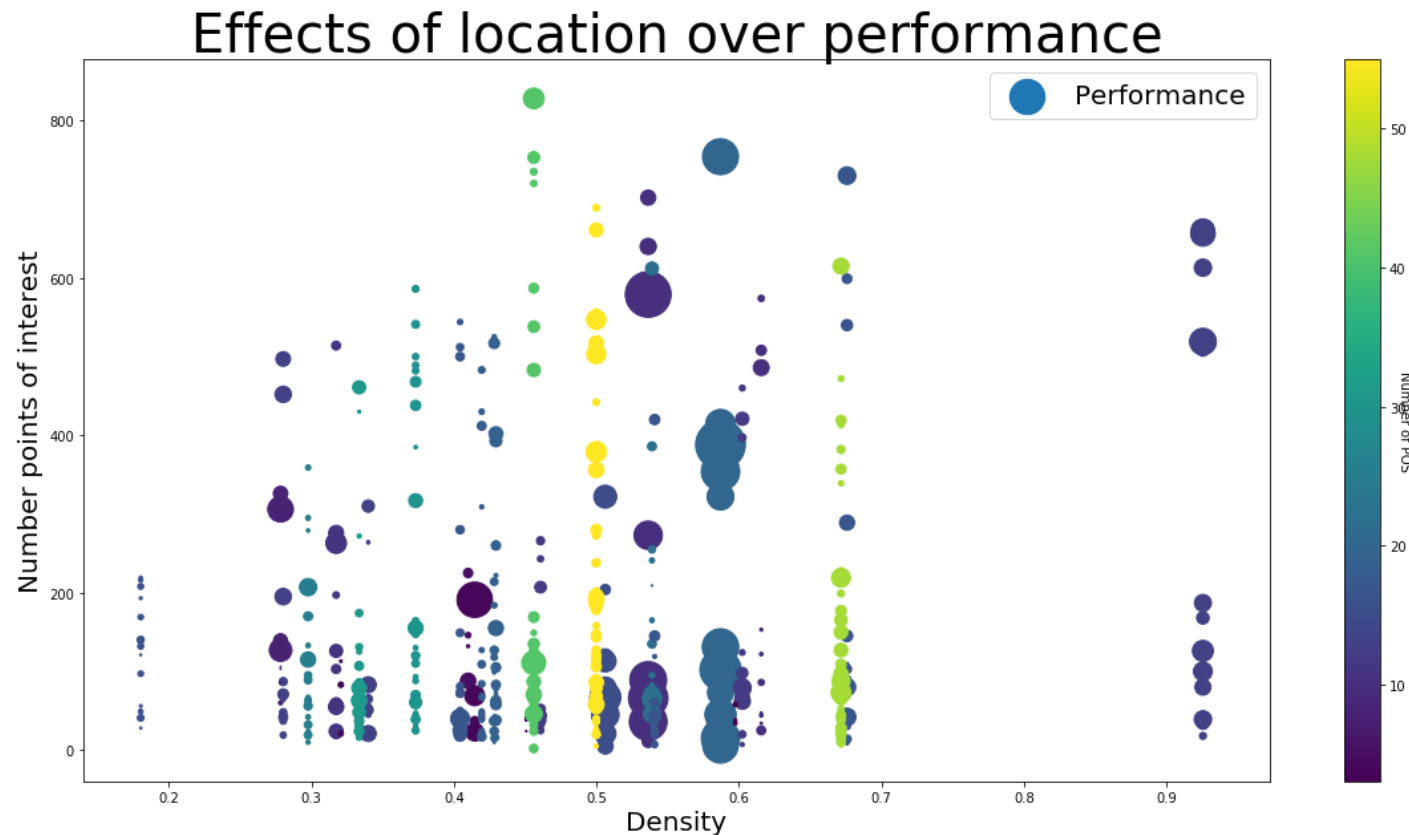# Important features – all stores
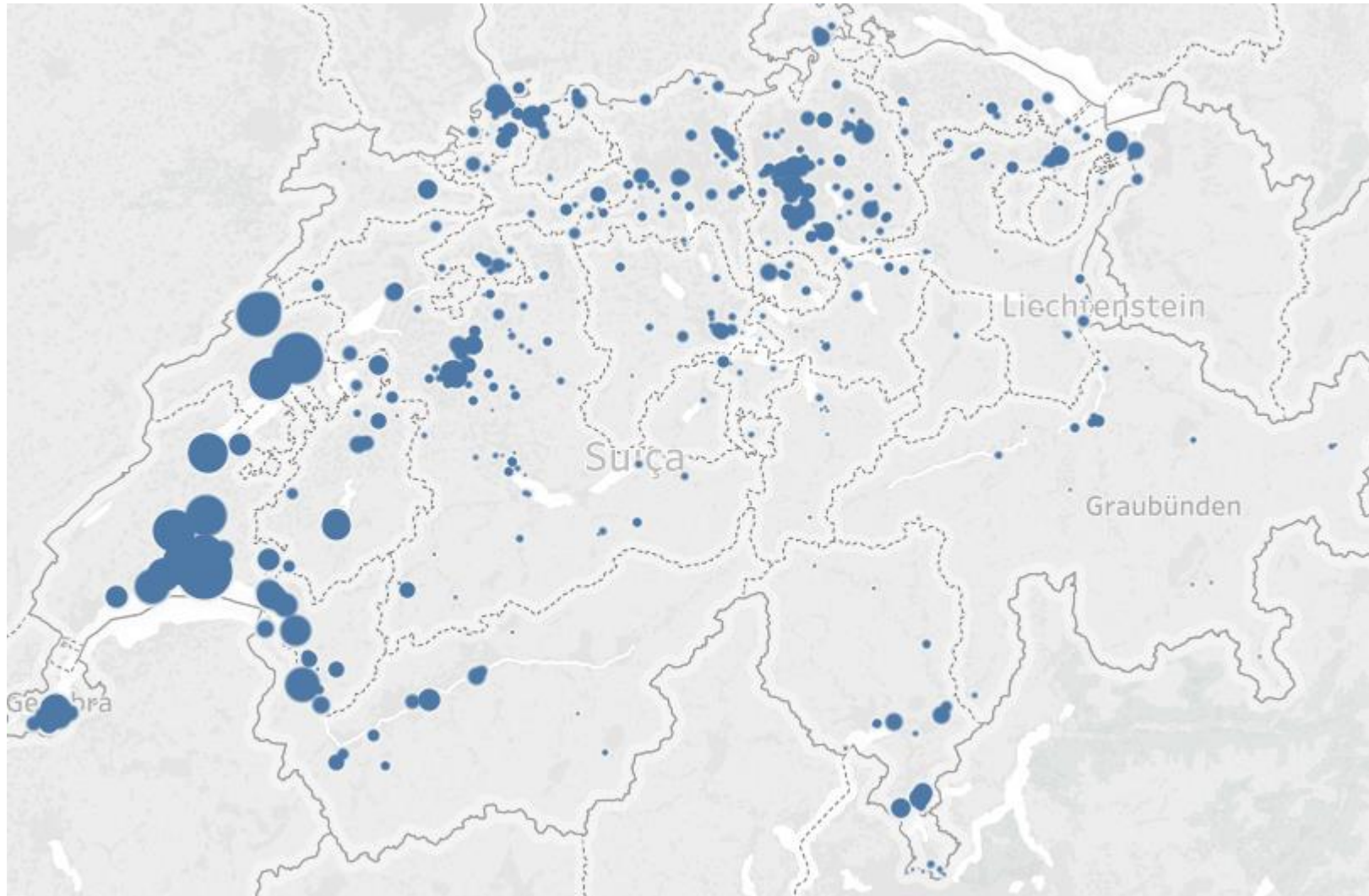
What makes a good location?

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- Derive new features from those clusters
  - Number of points in cluster
  - Number of POS in cluster
  - Density of cluster

What makes a good location?

- High concentration of POS correlates to lower performance

- Possible to divide cities between dense and non dense locations

Important features – small and big locations

- POS in dense locations are favored by being close to transports and clothing stores

- POS in less dense locations are favored by being close to places to eat and drink particularly restaurants

- For a consumer goods product that might be consumed on a daily basis, the presence of POS where customer often goes make it ease to purchase. This is specially prevalent if the purchase is mainly impulse driven

Conclusions and recommendations

- Avoid concentrating POS, correlates to low performance

- Place POS in dense locations close to transportation

- Place POS in less dense locations close to "eat and drink" places