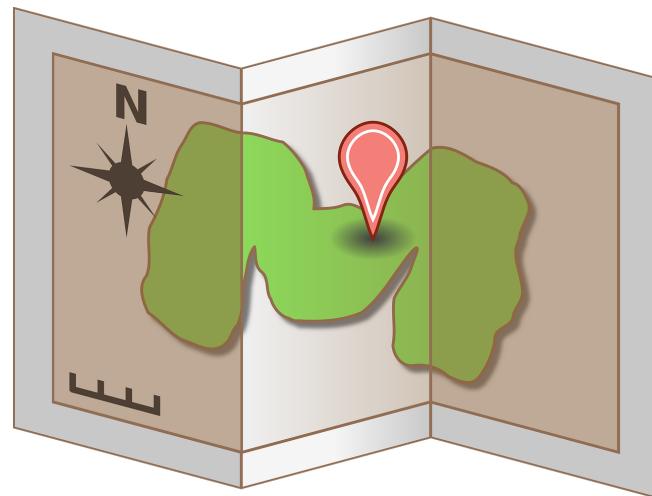


# Datetime and coordinates

# Datetime and coordinates



# Date and time

1. Periodicity
2. Time since
3. Difference between dates

# Date and time

## 1. Periodicity

Day number in week, month, season, year  
second, minute, hour.

## 2. Time since

## 3. Difference between dates

# Date and time

## 1. Periodicity

Day number in week, month, season, year  
second, minute, hour.

## 2. Time since

### a. Row-independent moment

For example: since 00:00:00 UTC, 1 January 1970;

### b. Row-dependent important moment

Number of days left until next holidays/ time passed after last holiday.

## 3. Difference between dates

# Date and time

## 1. Periodicity

Day number in week, month, season, year  
second, minute, hour.

## 2. Time since

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For example: since 00:00:00 UTC, 1 January 1970;

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Number of days left until next holidays/ time passed after last holiday.

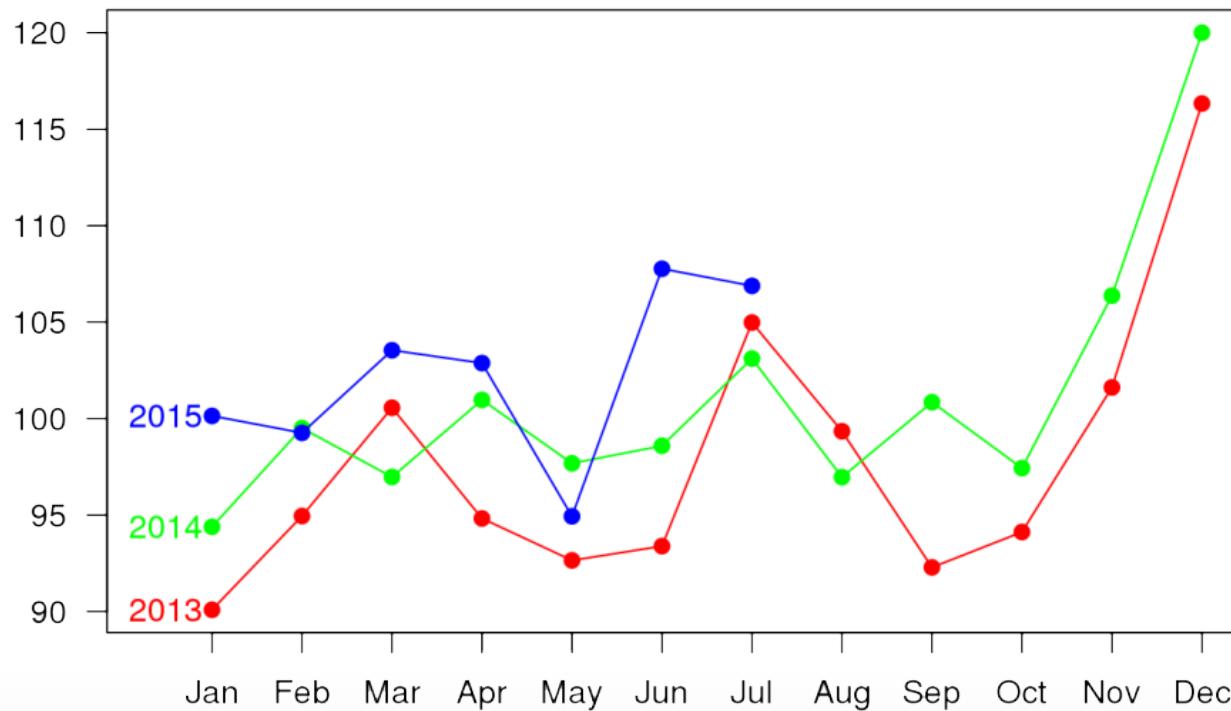
## 3. Difference between dates

`datetime_feature_1 - datetime_feature_2`

# Date and time



## Seasonal plot: SalesTS



Rossmann Store Sales, <https://www.kaggle.com/thie1e/exploratory-analysis-rossmann>

# Periodicity. «Time since»

| Date       | weekday | daynumber_since_year_2014 | is_holiday | days_till_holidays | <i>sales</i> |
|------------|---------|---------------------------|------------|--------------------|--------------|
| 01.01.2014 | 5       | 0                         | True       | 0                  | 1213         |
| 02.01.2014 | 6       | 1                         | False      | 3                  | 938          |
| 03.01.2014 | 0       | 2                         | False      | 2                  | 2448         |
| 04.01.2014 | 1       | 3                         | False      | 1                  | 1744         |
| 05.01.2014 | 2       | 4                         | True       | 0                  | 1732         |
| 06.01.2014 | 3       | 5                         | False      | 9                  | 1022         |

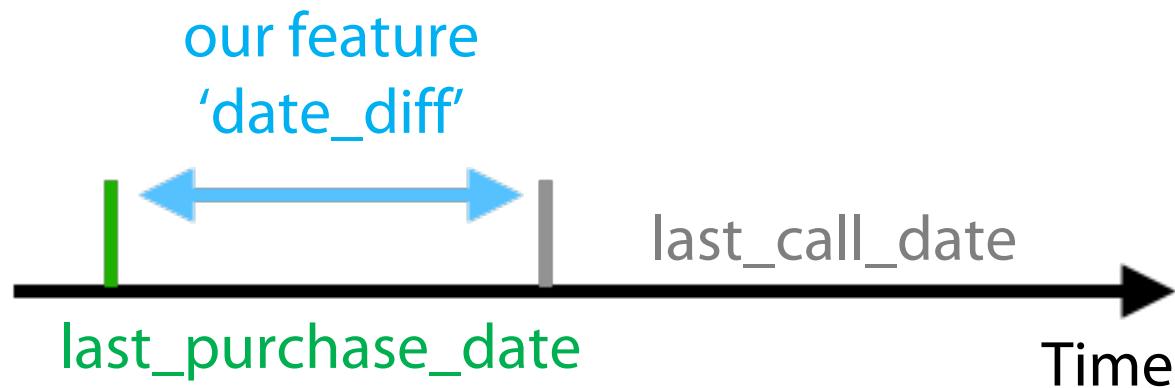
# Difference between dates

## Churn prediction

| <b>user_id</b> | <b>registration_date</b> | <i>last_purchase_date</i> | <i>last_call_date</i> | <b>date_diff</b> | <b>churn</b> |
|----------------|--------------------------|---------------------------|-----------------------|------------------|--------------|
| 14             | 10.02.2016               | 21.04.2016                | 26.04.2016            | 5                | 0            |
| 15             | 10.02.2016               | 03.06.2016                | 01.06.2016            | -2               | 1            |
| 16             | 11.02.2016               | 11.01.2017                | 11.01.2017            | 1                | 1            |
| 20             | 12.02.2016               | 06.11.2016                | 08.02.2017            | 94               | 0            |

# Difference between dates

For a particular user:



# Competitions with coordinates

Western Australia Rental Prices

**Deloitte.**

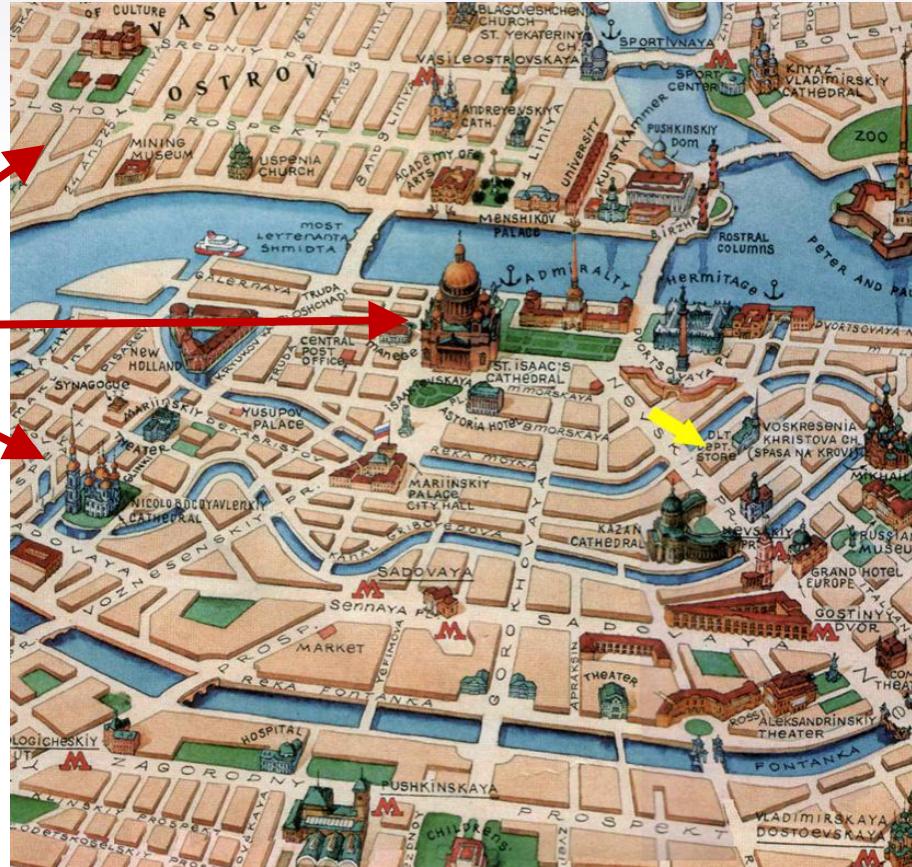


Sberbank Russian Housing Market



# Coordinates

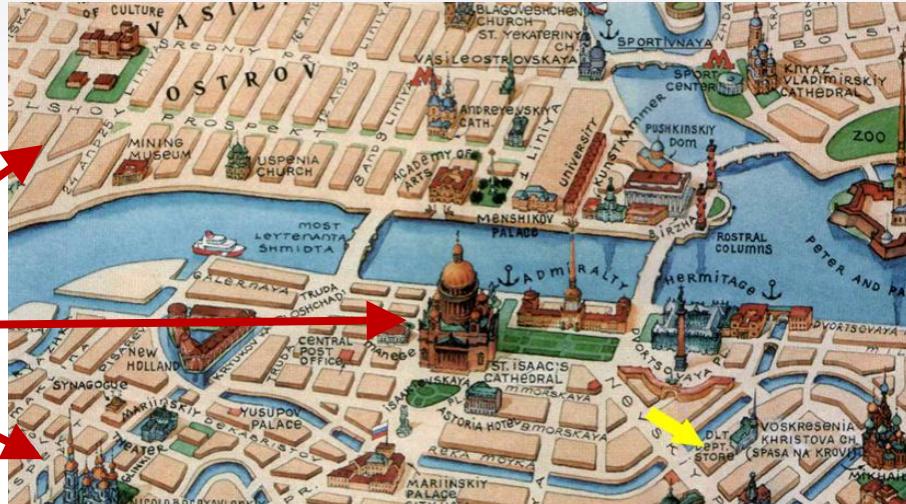
Additional  
data



St. Petersburg

# Coordinates

Additional  
data

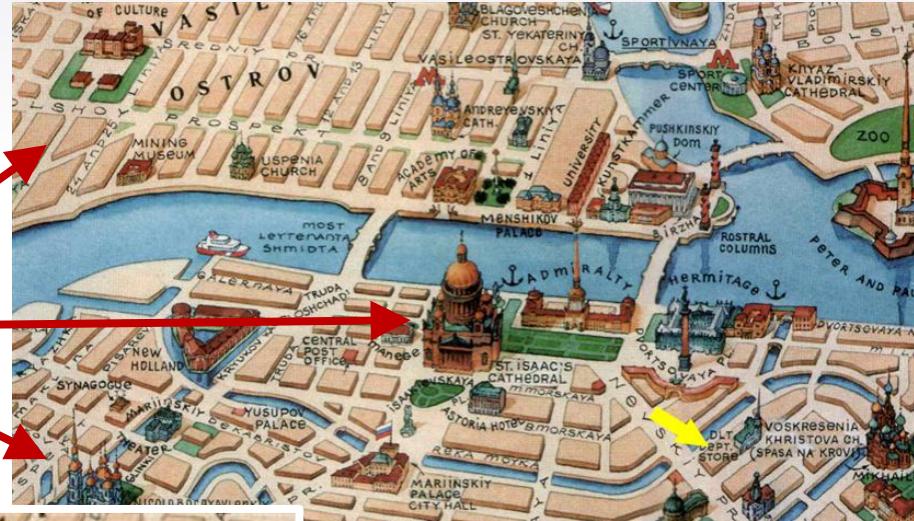


Other train samples  
and centers of  
clusters

St. Petersburg

# Coordinates

Additional  
data



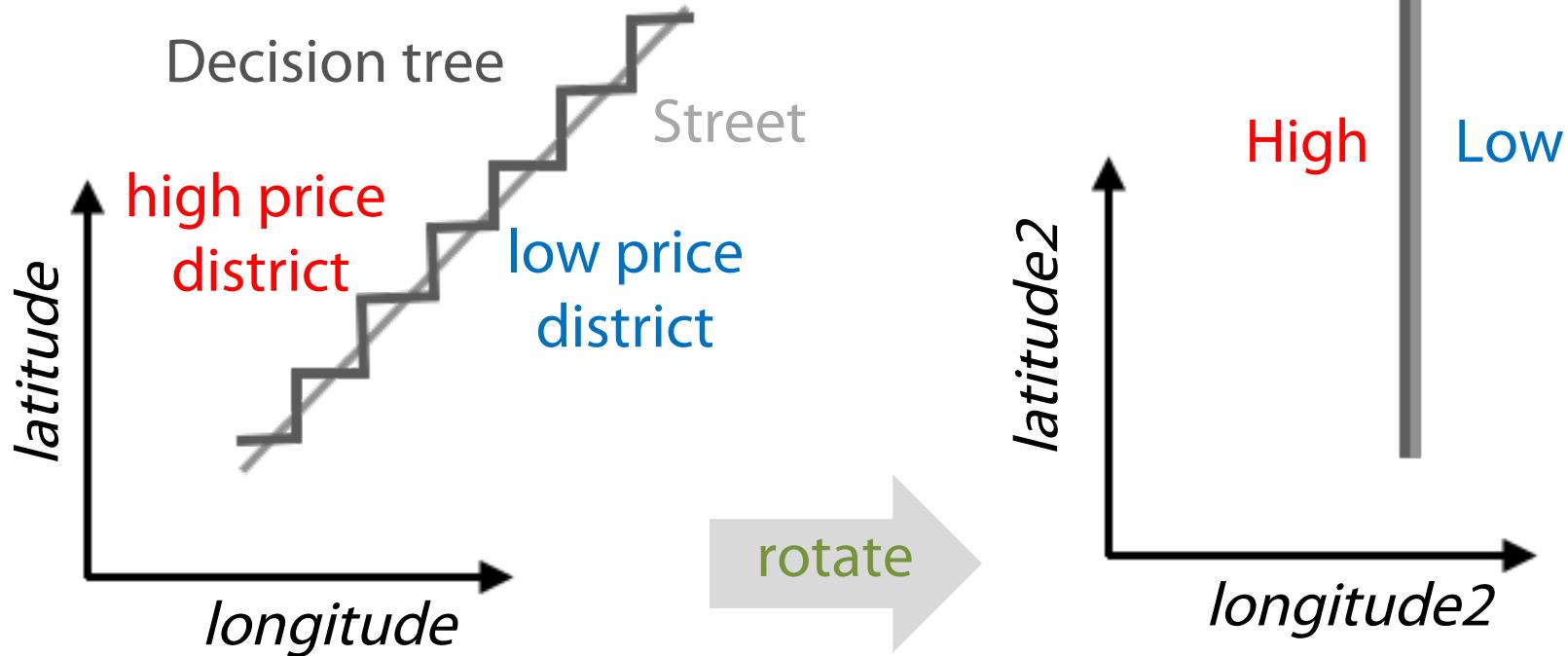
Other train samples  
and centers of  
clusters



Aggregated  
stats

St. Petersburg

# Coordinates



# Conclusion

1. Datetime
  - a. Periodicity
  - b. Time since row-independent/dependent event
  - c. Difference between dates
2. Coordinates
  - a. Interesting places from train/test data or additional data
  - b. Centers of clusters
  - c. Aggregated statistics