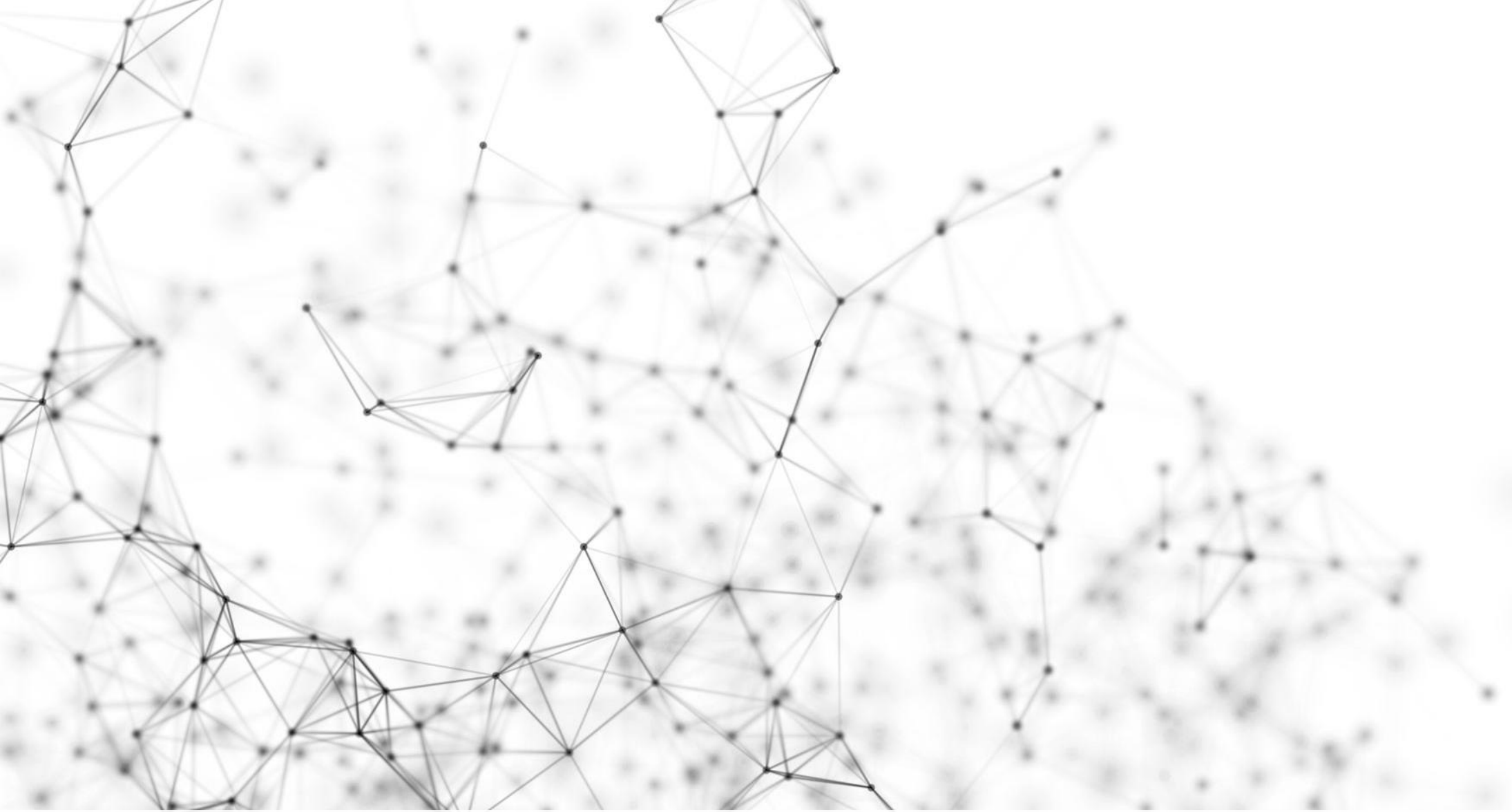


Hotel Demand and Cancellation Forecast

Brian Lui

Machine Learning and the Hotel Industry

- Hotels have daily limited perishable inventory
- Unsold rooms = Lost Revenue
- Overselling rooms:
  - Pay for a comparable hotel
  - Transportation costs
  - Damage to reputation and loyalty




How Machine Learning Can Help

Revenue Management: “sell the right product to the right customer at the right time and at the right price”

Metrics of Success:

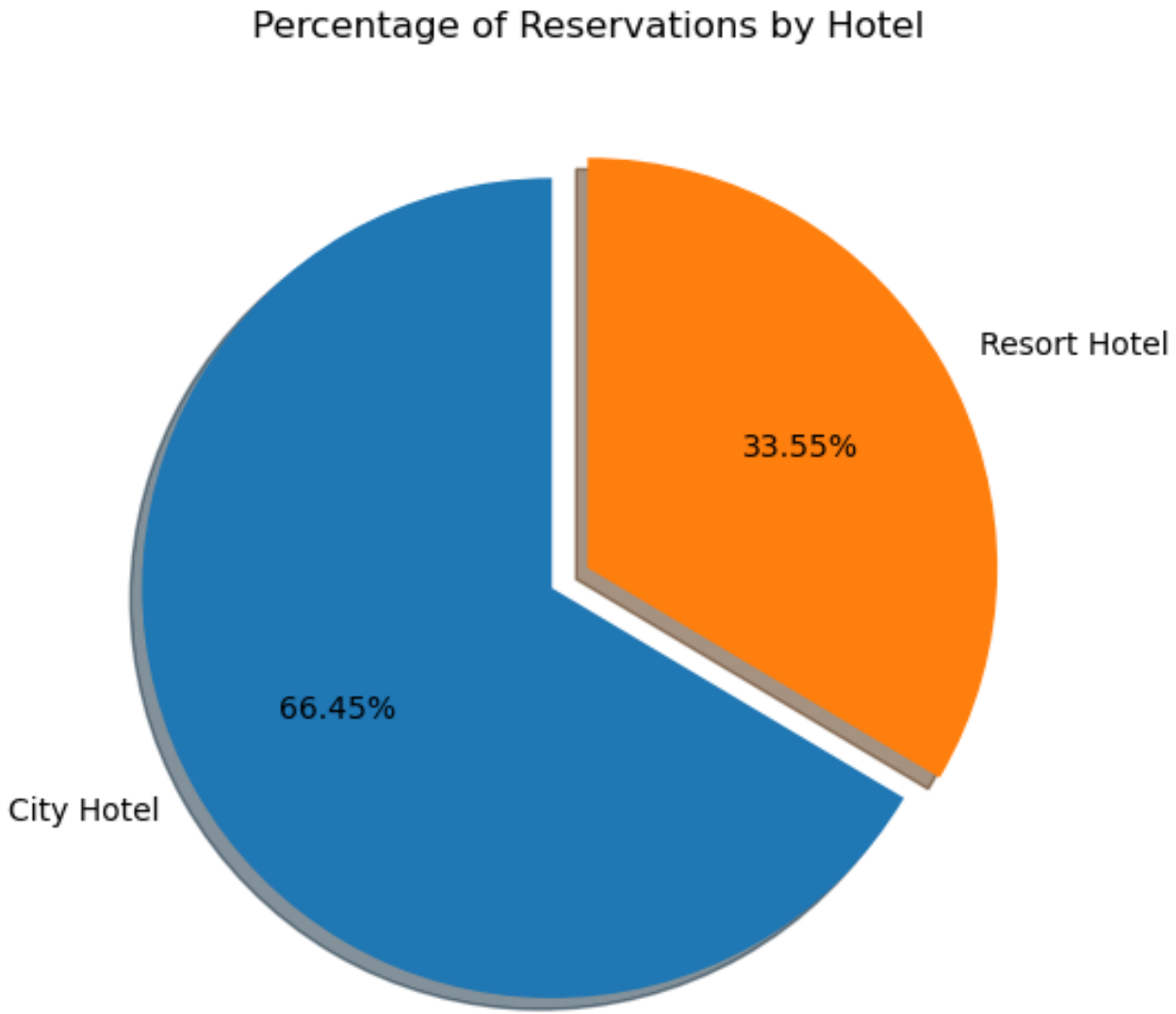
- Maximize Revenue Per Available Room (RevPAR)
- Reaching a ”perfect sell”

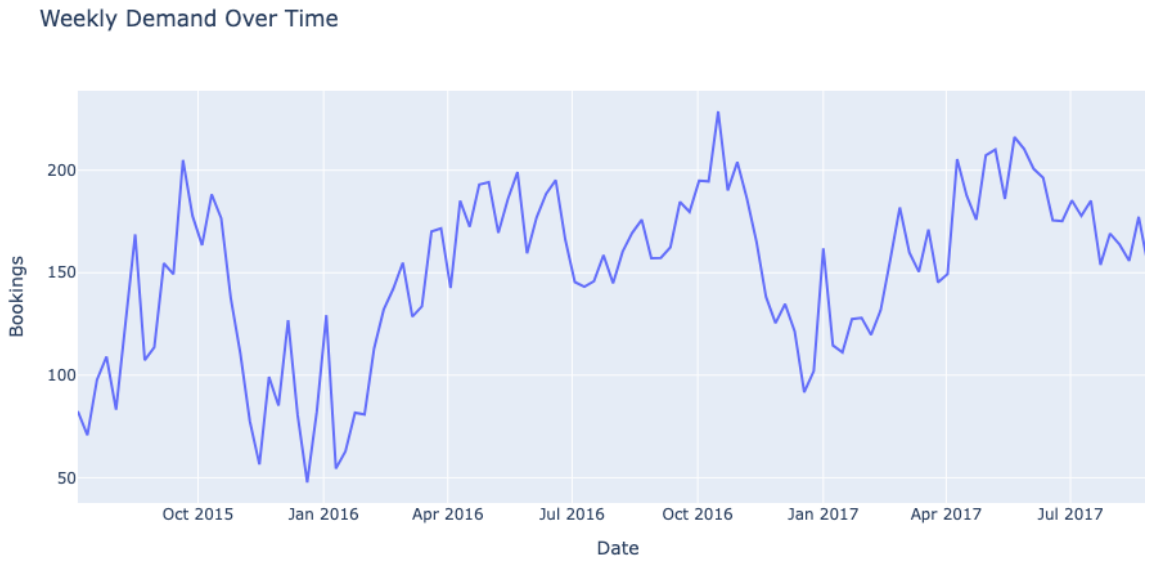
Predicting demand and cancellations to optimize pricing strategies

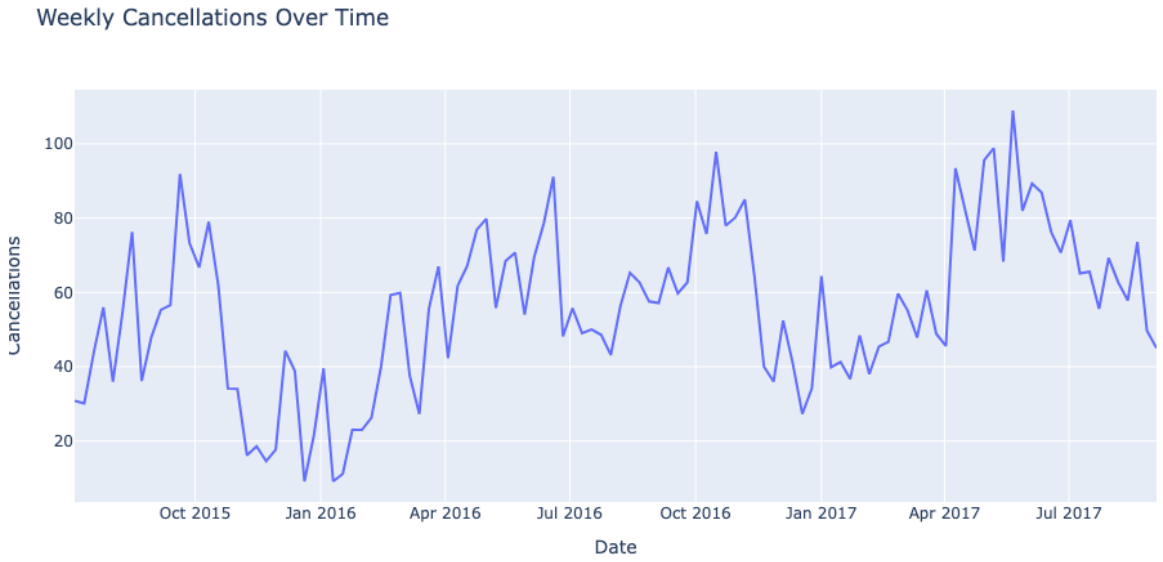
The Dataset

Important Columns:

- *is_canceled*
- *Arrival_date (year, month, day of month)*
- *Market_segment*
- *Lead_time*
- *Customer_type*





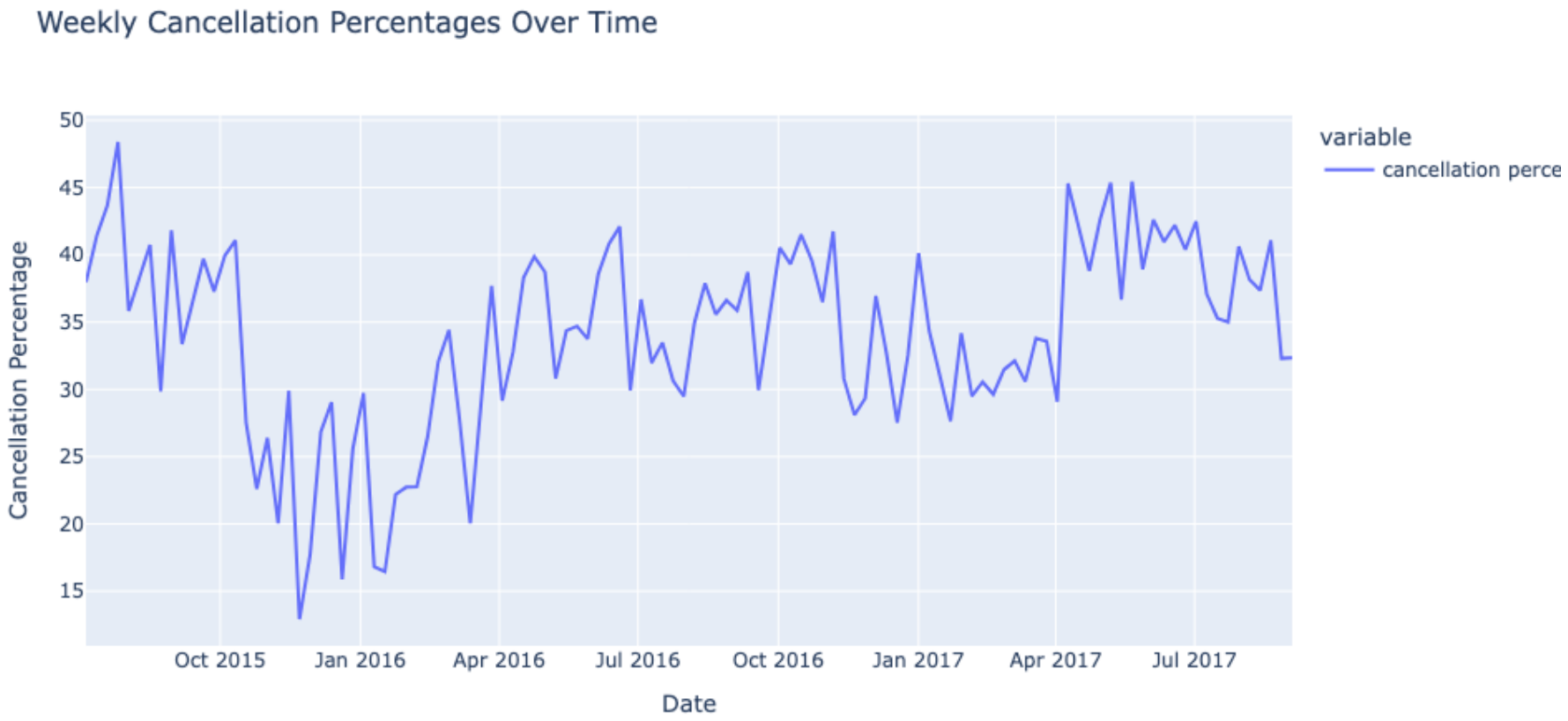


Initial EDA: Cancellation and Demand over Time

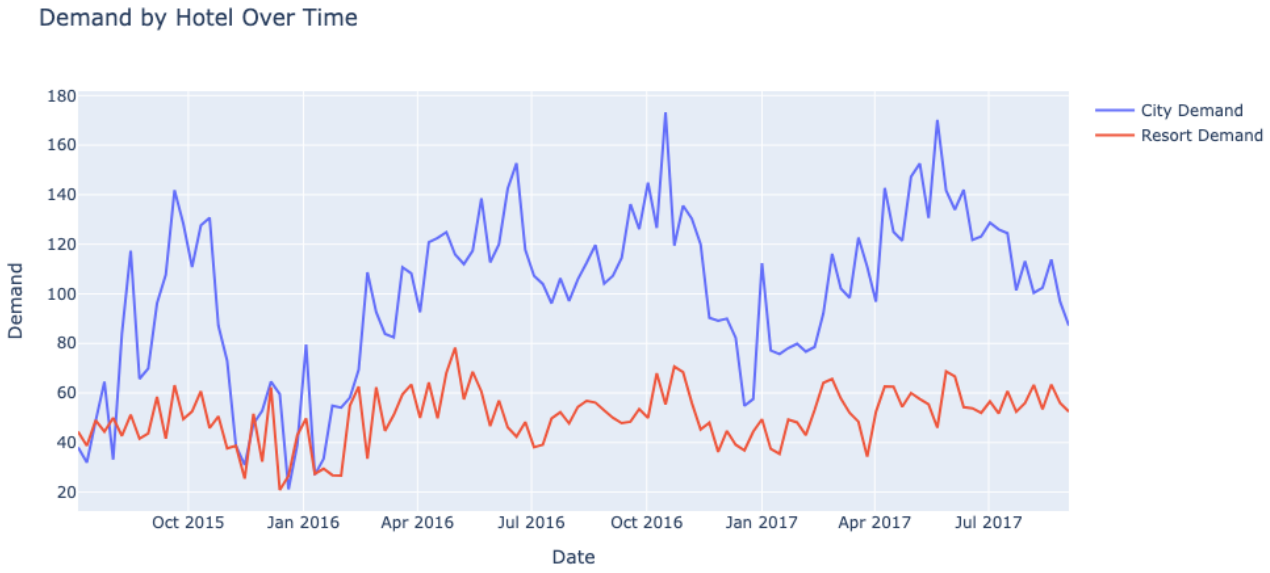
Seasonality seen between Demand and Cancellations

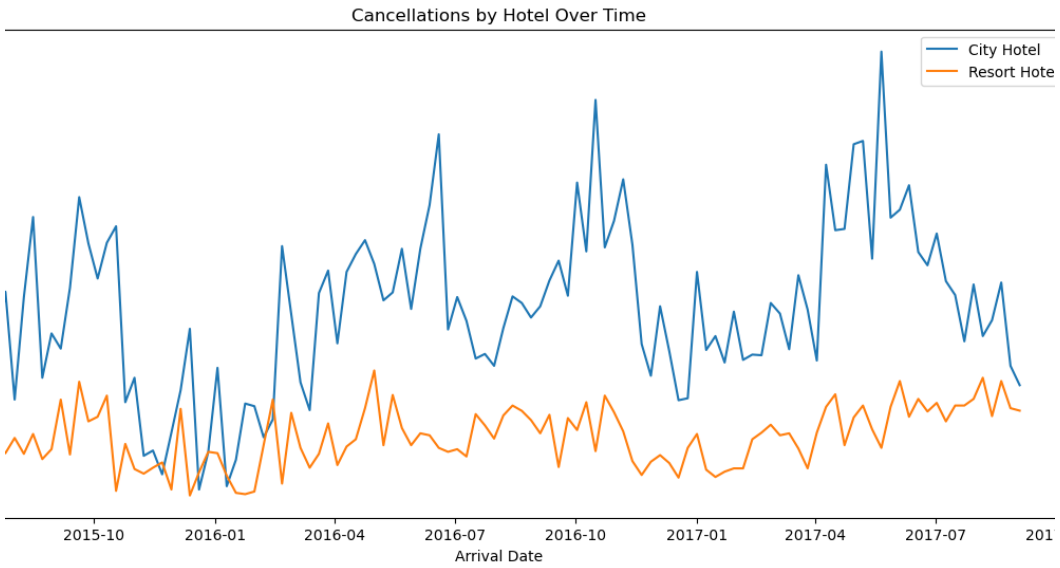
- Peaks in October
- Valleys in January
- Increase in April

Cancellation Percentages



- High cancellation % overall
- Between 30-40% throughout the dataset
- Identified large cancelled group bookings during EDA





Demand and Cancellation by Hotel Type

City Hotel:

- Higher demand and cancellations
- Larger peaks and valleys
- Likely influences the overall datasets trends

Cancellation Trends:

- City hotels have corporate travelers
- Last minute cancellations and bookings
- Resort hotels have mainly leisure guests

Next Steps

Further EDA

- Customer Type
  - Group
  - Contract
  - Transient
- Market Segments
  - Corporate
  - OTA's (Booking.com, Expedia)
  - Direct
- Trends with lead times

Feature Engineering

Thank You