

Summary

Objective:

The project aims to leverage advanced data analytics to enhance operational efficiency and profitability in the hospitality industry by focusing on three key areas: customer segmentation, demand forecasting, and cancellation forecasting.

Dataset:

Utilizing a dataset of 140,000 hotel bookings from two hotels in Portugal across 2018, 2019, and 2020, we analyze various factors influencing customer behavior, pricing strategies, and operational performance.

Key Focus Areas:

1. Customer Segmentation:

- Analyze customer demographics and behaviors to identify distinct segments.
- Tailor marketing strategies and improve guest experiences based on identified preferences.

2. Time Series Forecasting:

- Employ statistical methods to predict future booking trends and occupancy rates.
- Utilize models like ARIMA, Exponential Smoothing, and Prophet to optimize pricing and resource allocation.

3. Cancellation Forecasting:

- Investigate historical booking data to identify patterns and factors contributing to cancellations.
- Develop predictive models to forecast cancellation rates, enabling proactive resource management.

Outcomes:

The project demonstrates the effectiveness of data-driven decision-making in optimizing hotel operations, enhancing customer satisfaction, and increasing financial performance. By integrating insights from the analysis, hotel managers can make informed strategies that ensure competitiveness in a rapidly evolving market.