

# **Cameron Hicks**

## **Capstone Two - Project Proposal**

### **Hotel Reservation Cancellation Risk Model**

In this capstone project I will use the Hotel Bookings dataset along with Global Weather Data API to create a Hotel Reservation Cancellation Risk Model. This model will be intended to assign a risk level to each reservation to help hotel leadership make key decisions based on their occupancy. There are many factors that may impact cancellations at a hotel, for destination hotels like the two include in the dataset, weather forecasts could be a primary factor travelers will take into account. By incorporating the weather forecast data, we will be able to see if these forecasts have an impact on cancellations for these hotels.

#### **Problem Statement**

Can we create a ML Model that will predict the risk of a hotel reservation being cancelled due to weather forecasts and other common factors.

#### **Context**

Hotel reservation cancellations can have a significant impact both on top line revenue and bottom line profit, especially when the cancellations are close to the reservation check in date. Understanding what drives cancellations can help hotels adjust their strategies such as how many rooms to overbook or how much labor to schedule. By forecasting cancellation probabilities, we can provide hotels the information they need to make decisions on these strategies that will help them produce the best possible business results.

#### **Criteria for Success**

- Successfully combine the Hotel Booking Data and Weather forecast data
- Identify the top attributes that contribute to reservation cancellations
- Deliver a Model that outputs the probability of a reservation cancellation

#### **Scope of Solution Space**

- Data Wrangling
  - Clean and pre-process Hotel Booking Dataset
  - Query Weather Forecast and actual weather data for Lisbon and Algarve from the Visual Crossing Weather API
  - Merge the Hotel Booking data and Weather data
- Data Exploration

- Identify the cancellation rates across the two hotels, reservation market segments, travelers country of origin, and weather forecasts
- Modeling
  - Train a model on dataset to create a predictive model

### **Constraints within solution space**

- API Rate Limits - Visual Crossing allows daily API calls, however limits the number. Hotel cancellation data may need to be batched by week rather than by day to stay within these limits

### **Stakeholders to provide key insight**

- Hotel GM
- Hotel Revenue Manager
- Hotel Sales Director

### **Key Data Sources**

- Hotel Booking Demand csv - provided by kaggle - <https://www.kaggle.com/datasets/jessemostipak/hotel-booking-demand/data>
- Visual Crossing Global Weather Data and API - <https://www.visualcrossing.com/weather-api/>