

# Project Synopsis: Hotel Booking Analysis

## 1. Title

Hotel Booking Analysis Using Python

## 2. Introduction

Hotel industry is one of the faster growing businesses of tourism sector. This Hotel Booking cancellation project is from Portugal country. This data was acquired by extraction from hotel's Property management system from 2015 to 2017 from hotel in region Algarve and Lisbon.

The hotel booking analysis project aims to leverage data-driven insights to enhance hotel operations and profitability. By analyzing booking patterns, customer demographics, and revenue metrics, the project seeks to uncover trends and behaviors that impact occupancy and financial performance. Through a comprehensive examination of booking and cancellation data, the project will provide actionable recommendations to drive strategic improvements and enhance the overall guest experience.

## 3. Objectives

The primary objectives of this project are:

- To explore and understand the features of the hotel booking dataset.
- To perform data preprocessing, including handling missing values and outliers.
- To identify the key factors that affect wine quality using statistical analysis.
- To build predictive models that can accurately determine the hotel cancellation.
- To visualize the results and present actionable insights.

## 4. Scope of Work

The project will involve the following tasks:

- **Data Exploration:** Understanding the dataset, including the features and target variable.
- **Data Preprocessing:** Cleaning the dataset by handling missing values, removing outliers, and normalizing/standardizing the data.
- **Feature Selection:** Identifying the most significant features influencing hotel cancellation.
- **Data Visualization:** Using plots and graphs to visualize the relationship between features and hotel cancellation.
- **Model Building:** Building and evaluating machine learning models to predict hotel cancellation.

- **Interpretation of Results:** Analysing the output of the models and drawing conclusions.
- **Reporting:** Documenting the findings and preparing a final report.

## 5. Methodology

The project will follow a structured approach:

1. **Data Collection:** The dataset will be sourced from a Kaggle Website.
2. **Data Preprocessing:**
  - Handle missing data using imputation techniques.
  - Detect and remove outliers.
  - Normalize or standardize the data if necessary.
3. **Exploratory Data Analysis (EDA):**
  - Use descriptive statistics to summarize the dataset.
  - Create visualizations like box plot, column plot, pie plot, line plot and correlation heatmaps to understand feature distributions and relationships.
4. **Feature Selection:**
  - Use correlation analysis to identify relevant features.
5. **Evaluation and Interpretation:**
  - Compare model performance.
  - Interpret the results to understand the impact of different features on Hotel Cancellations.
6. **Visualization:**
  - Generate charts and graphs to visualize the findings.
7. **Reporting:**
  - Compile the analysis, results, and insights into a comprehensive report.

## 6. Tools and Technologies

The project will utilize the following tools and technologies:

- **Programming Language:** Python
- **Libraries:** Pandas, NumPy, Matplotlib, Seaborn.
- **IDE:** Jupyter Notebook
- **Data Source:** Kaggle Website (Hotel Booking Analysis).

## 7. Expected Outcomes

- The expected outcomes of a hotel booking analysis project typically focus on gaining actionable insights that can drive strategic decisions, improve operational efficiency, and enhance overall business performance.
- By implementing dynamic pricing based on analysis, a hotel could see an increase in revenue by optimizing room rates according to demand fluctuations.
- Addressing common feedback issues could lead to higher guest satisfaction scores and increased repeat bookings.

- These outcomes aim to enhance various aspects of hotel operations, from financial performance and customer satisfaction to marketing effectiveness and operational efficiency.
- By achieving these outcomes, the hotel can improve its overall business performance and competitive position in the market.

## **8. Timeline**

The project is expected to be completed within a [specific timeframe, e.g., 4 weeks], with the following milestones:

- Week 1: Data Collection and Preprocessing
- Week 2: Exploratory Data Analysis and Feature Selection
- Week 3: Model Building and Evaluation
- Week 4: Visualization, Reporting, and Final Submission

## **9. Conclusion**

This project will provide valuable insights into the factors that determine hotel cancellation analysis, leveraging data analysis techniques. The results of this analysis could be beneficial for hotel owner and the hotel industry in enhancing revenue and customer satisfaction. This project provides a comprehensive overview of the findings, their implications, and actionable recommendations, while also suggesting areas for future research. It aims to encapsulate the core insights gained from the analysis and guide strategic decisions to improve hotel operations and performance.