**CCT College Dublin**

**Assessment Cover Page**

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| **Module Title:** | Strategic Thinking/ Higher Diploma Data Analytics for Business |
| **Assessment Title:** | Individual / Practical |
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| **Assessment Due Date:** | 15 Dec 2023 |
| **Date of Submission:** |  |

**Declaration**

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| By submitting this assessment, I confirm that I have read the CCT policy on Academic Misconduct and understand the implications of submitting work that is not my own or does not appropriately reference material taken from a third party or other source. I declare it to be my own work and that all material from third parties has been appropriately referenced. I further confirm that this work has not previously been submitted for assessment by myself or someone else in CCT College Dublin or any other higher education institution. |

**Hospitality Management and importance of Data Analysis**

Subject area: Hospitality Management with focus on Revenue Management

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Introduction

Hotel Revenue Management requires a solid understanding of business data, be it managing room rates, negotiating agreements about commissions through a variety of distribution channels, or scouting the competition’s room rates in order to remain competitive in the market. In today’s data driven world, it is increasingly important to track, collect and analyse hotel’s data to transform it into actionable results in order to target the audience effectively and retain competitive advantage.

Business Analysis and Project Plan

Historical data will also help up to predict future guests’ behaviour, predict demand and identify new trends. They also demonstrate cycles, seasonality, patterns and any anomalies that can impact the sales and future demand. Hotel data are typically gathered from a diverse source, including industry reports, market research, sales records, online analytics, and guests’ surveys.

We’re going to look at the historical data of the two different properties in Portugal, one being hotel is located in the city of Lisbon and the second property is a holiday resort in the region of Algarve and identify key areas of revenue enhancement.

When it comes to hotel revenue management, the following are essential business knowledge areas:

- Evaluate historical data to identify Average Daily Rate (ADR)

- Revenue per Available Room (RevPAR)

- % occupancy rates

- Direct bookings and distribution channels

- Meeting, Incentive, Conferences and Events (MICE) - average group sizes and even activity

Use of technologies

We have used two different supervised machine learning models, Random Forest and Linear regression, that may often use in regression and classification problems.

Libraries

We have downloaded all the libraries, panda for data manipulation and analysis library, matplotlib.pyplot and seaborn for data visualisation, numpy for numerical computing, sklearn libraries for future scaling for ML models, PCA, encoding, training and testing sets, linear regression model for predictive modelling. Libraries are now imported and have been assigned the abbreviated formats. The abbreviated format makes recalling and using these libraries more efficient. Lastly, we have uploaded a csv file that we renamed as a hotel.df for easy reference.

Dataset and Data Understanding

Data was acquired from Property Management Systems SQL databases. The dataset contains actual bookings due to arrive from 01st July 2015 to 31st Aug 2017 and includes bookings that have materialized and bookings that were cancelled. The data set has 119390 observations and 32 features, where each observation represents a hotel booking.

Data Prep

Data Vis

Models

We have used two different machine learning algorithms including linear regression and random forest algorithm. Both the models have focused on to resolve the regression and classification prediction of featured variable. We have done different steps to make the data useful. Such as removing unnecessary variables and making the dummy variables of symptoms using age of the patients. After encoding there were 4239 rows and 44 feature variables in this dataset.

## Challenges encountered

Different challenges have been encountered in working with this dataset and applying models on it. These challenges may include the big size of dataset, categorizing the descriptive text of symptoms. There were a lot of missing values, cleaning and pre-processing of the data, sparse data after encoding, finding the perfect model that may give greater accuracy.

Challenges

Analysis of Results

Conclusion

Conclusion: Create flexible price plans depending on competition analysis, seasonality, and demand.

Strategically use promotions and discounts to increase demand.

Working together and communicating:

Encourage cooperation between the marketing, sales, and revenue management departments.

Align price tactics with marketing initiatives and sales targets.

Integrating operations:

Make sure that decisions about pricing and inventory are in line with the hotel's capacity and service capabilities by closely collaborating with operations.

Loop of Feedback and Adjustment:

Create a routine evaluation procedure to evaluate how well revenue management tactics are working.

Pricing and distribution strategies can be iteratively adjusted by using feedback.

Instruction and Growth:

Staff members should receive training on new tools and technology.

Ascertain that the group is prepared to adjust to modifications in price and distribution tactics.

Timeline

References

<https://www.sciencedirect.com/science/article/pii/S2352340918315191>

<https://www.kaggle.com/>

<https://towardsdatascience.com/how-to-clean-your-data-in-python-8f178638b98d>

<https://realpython.com/>

<https://www.geeksforgeeks.org/>

* project management methodology to develop and execute a capstone project.
* You will select a dataset
* conduct exploratory data analysis
* pre-process the data
* implement at least one machine learning algorithm,
* and present your findings effectively through a comprehensive report

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the project plan,

business understanding,

data understanding,

data preparation,

machine learning implementation,

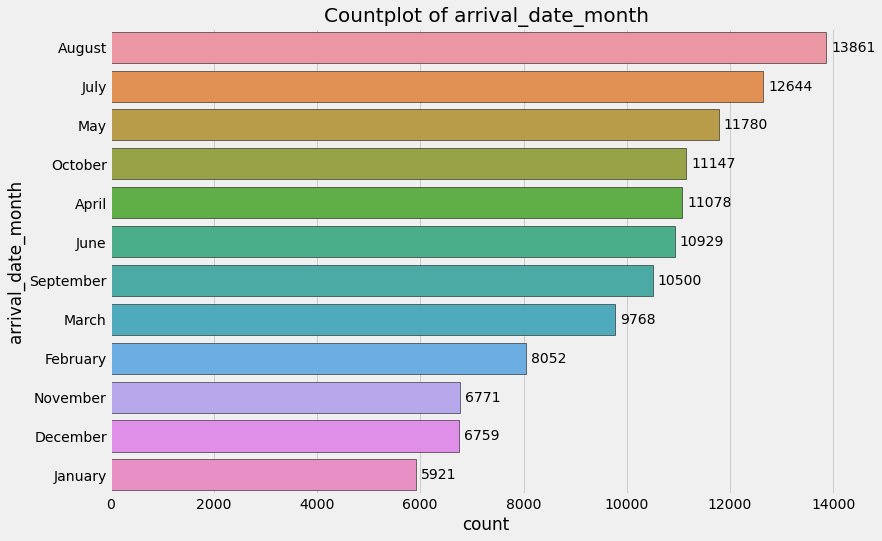
and an artefact of code.

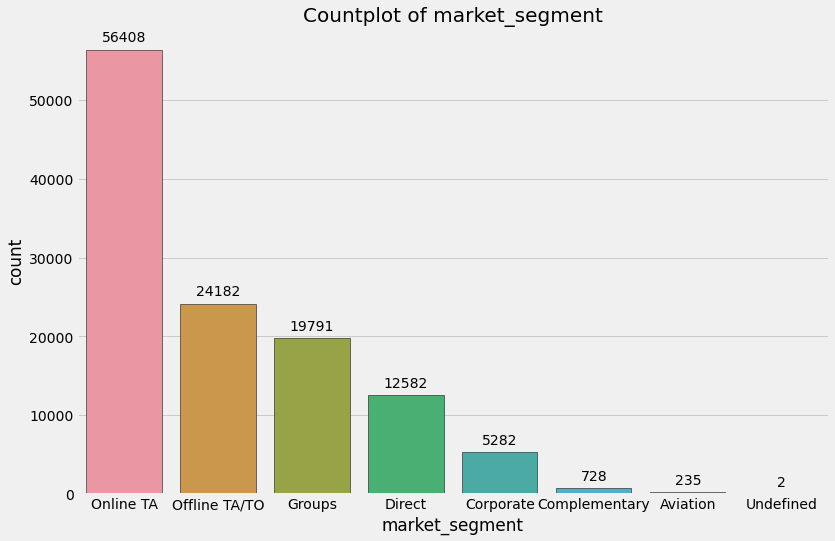
summary of the findings,

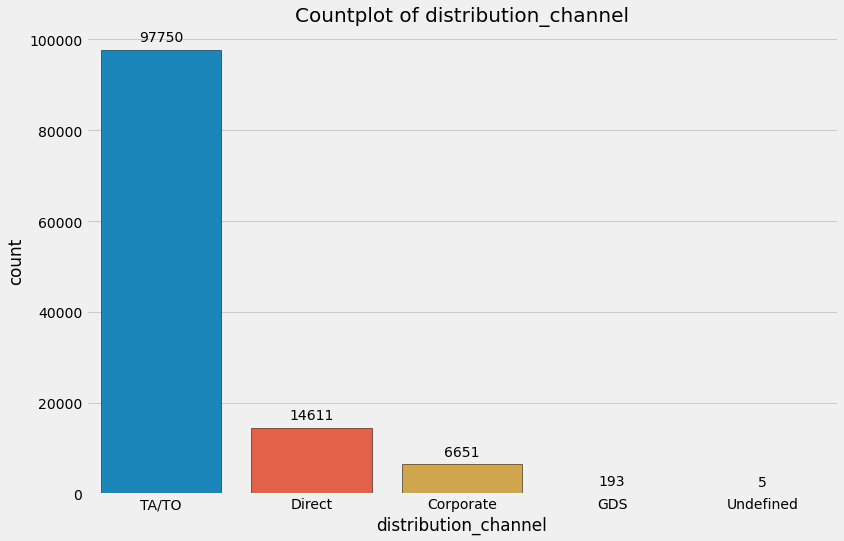
conclusions

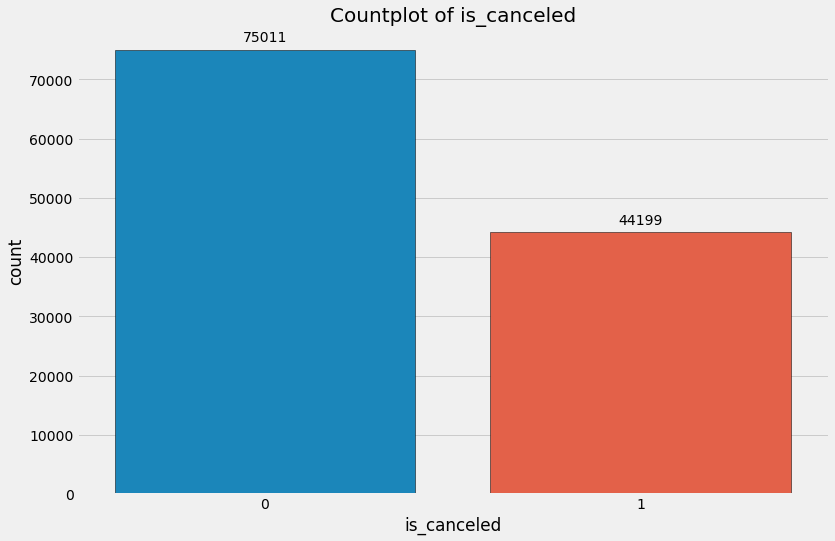
any future recommendations.

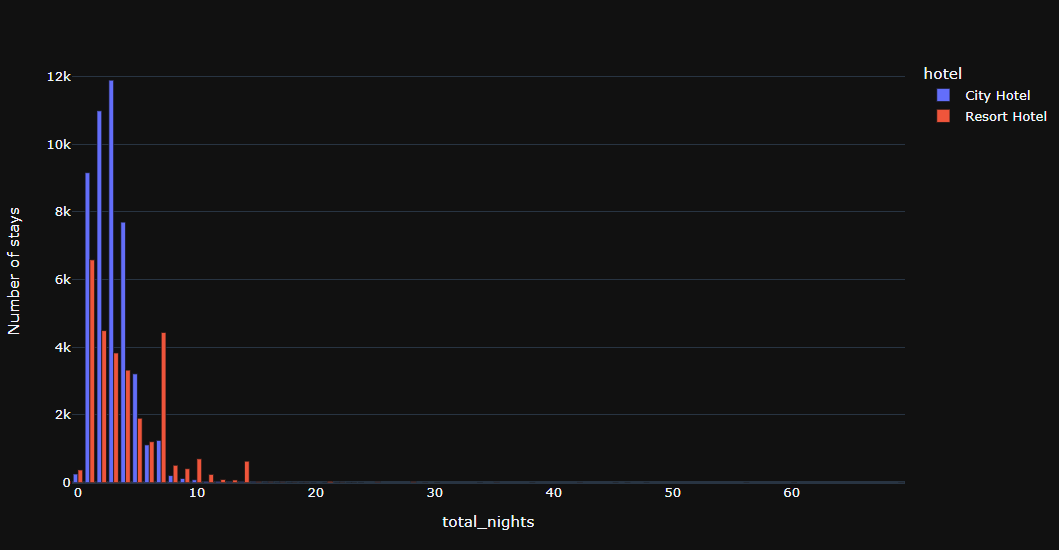
**overview of the project's timeline, milestones achieved, and any challenges faced during the implementation phase, key insights gained from analysing the data and present any significant trends or patterns observed, the report should address any limitations or constraints encountered during the project and propose potential solutions for future improvements.**

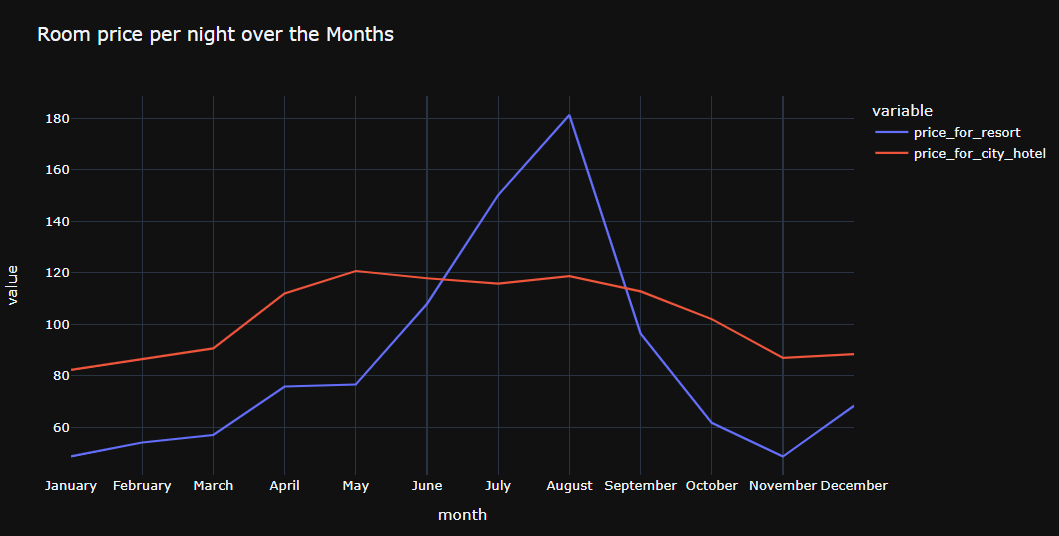


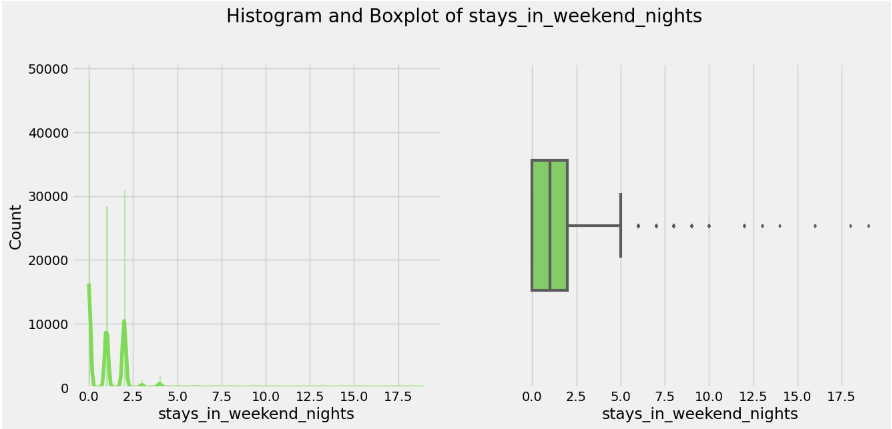


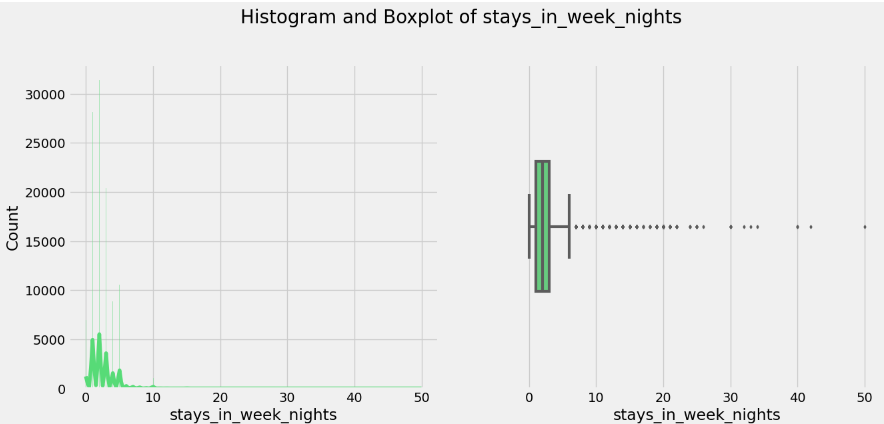


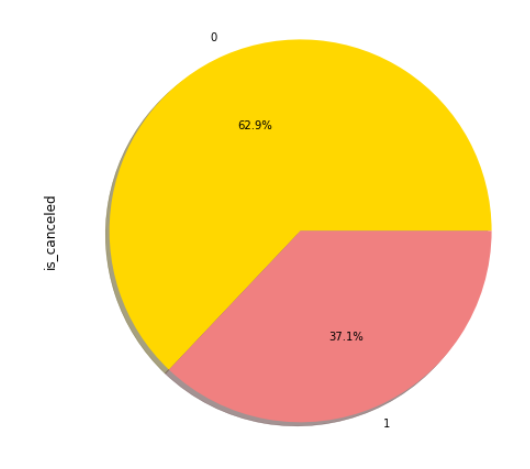












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