Project Summary

Capstone Project – 3

[Airline Passenger Referral Prediction](https://github.com/iamanantalok/Airline-Passenger-Referral-Prediction#airline-passenger-referral-prediction)

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| **Project Owner**:  Name: Anant Alok  Email ID: [iamanantalok@gmail.com](mailto:iamanantalok@gmail.com) |
| **GitHub Link:**  [**https://github.com/iamanantalok/Airline-Passenger-Referral-Prediction**](https://github.com/iamanantalok/Airline-Passenger-Referral-Prediction) |
| **Please write a short summary of your Capstone project and its components. Describe the problem statement, your approaches and your conclusions. (200-400 words)** |
| The "Airline Passenger Referral Prediction" project aims to create a data-driven solution for forecasting passenger referrals in a commercial airline. Referrals are instances where current passengers recommend the airline's services to potential new customers. This project acknowledges the significant influence of word-of-mouth recommendations in the aviation sector and aims to optimize and capitalize on this marketing channel.  Key Project Objectives:   1. Data Collection and Preparation: The project involves gathering comprehensive historical data related to passenger referrals. This data includes various attributes such as passenger demographics, flight details, referral sources, and referral outcomes. Rigorous data cleaning and transformation processes will be carried out to ensure data quality and suitability for analysis. 2. Feature Engineering: The project will focus on creating meaningful features from the collected data. These features will include elements such as referral source types (e.g., social media, in-flight conversations), passenger flight frequency, loyalty status, and geographical variables. These engineered features will serve as the foundational inputs for the predictive model. 3. Advanced Model Development: The core of the project is the development of a robust predictive model using advanced machine learning techniques. This model will predict the likelihood of a passenger making a referral based on various features. Different algorithms, including logistic regression, decision trees, random forests, and potentially more advanced methods like gradient boosting and neural networks, will be explored and fine-tuned for optimal performance. 4. Model Training and Validation: The dataset will be split into distinct training and validation subsets to facilitate model training. Techniques such as cross-validation will be used to ensure the model's reliability and effectiveness. This iterative process will also help optimize the model's hyperparameters. 5. Performance Evaluation: Thorough evaluation of the model's predictive accuracy will be conducted using established metrics such as accuracy, precision, recall, F1-score, and the area under the receiver operating characteristic curve (AUC-ROC). These metrics will provide a comprehensive understanding of the model's strengths and weaknesses. 6. Insights and Interpretability: The model's results will be carefully analyzed to extract valuable insights into the main drivers of passenger referrals. This analysis may include an examination of feature importance, shedding light on the key factors influencing successful referrals. 7. Integration Strategy: The project will outline a strategic plan for seamlessly integrating the predictive model into the airline's operational systems. The objective is to enable real-time referral predictions, enhancing the passenger experience during booking and post-flight interactions. 8. Ongoing Monitoring and Maintenance: A comprehensive monitoring system will be established to continuously track the model's performance. Regular updates and maintenance will be carried out to ensure sustained accuracy, accommodating changes in passenger behavior and evolving market dynamics. 9. Ethical Considerations: The project will actively address potential ethical concerns related to passenger privacy, data security, and fair treatment of individuals in predictions. Compliance with legal regulations and industry standards will be of utmost importance. 10. Business Implications: The project will assess the expected impact of the referral prediction model on critical business metrics. This includes forecasting increased customer acquisition rates, optimizing marketing campaigns, and ultimately improving overall customer satisfaction.   In conclusion, the "Airline Passenger Referral Prediction" project aims to utilize data-driven insights to transform the airline's marketing efforts. By accurately predicting passenger referrals and understanding the contributing factors, the project seeks to enable targeted marketing strategies, personalized customer interactions, and improved business outcomes. |