Model Development Phase Template

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| Date | 15 March 2024 |
| Team ID | 739927 |
| Project Title | Smart Lender-Flight Delay prediction |
| Maximum Marks | 5 Marks |

**Feature Selection Report Template**

In the forth coming up date ,each feature will be accompanied by a briefed scription. Users will indicate whether it's selected or not, providing reasoning for their decision. This process will streamline decision-making and enhance transparency in feature selection.

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| **Feature** | **Description** | **Selected (Yes/No)** | **Reasoning** |
| **YEAR** | It tells about the year Data | No | For predicting The year data |
| **QUARTER** | The year is divided into four quarters | Yes | To make the data Seasonal Patterns |
| **MONTH** | It tells about the Month data | Yes | For predicting The Month data |
| **DAY\_OF\_MONTH** | specific day within a month on which a flight is scheduled to depart. | Yes | That might occur on specific days, such as the beginning or end of the month, when travel volume may vary significantly. |

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| **DAY\_OF\_WEEK** | Indicates the day of the week a flight is scheduled to depart. | | | Yes | | patterns and trends in flight delays that may vary by day, such as increased delays on weekends due to higher passenger volumes or maintenance schedules.. | | |
| **UNIQUE\_CARRIER** | Represents the airline carrier code | | | No | | levels of operational efficiency, reliability, and historical delay patterns that can significantly impact delay probabilities. | | |
| **TAIL\_NUM** | Refers to the unique identifier assigned to each aircraft. | | | No | | to identify patterns and trends associated with specific aircraft, such as maintenance issues or performance characteristics that may influence delays. | | |
| **FL\_NUM** | The unique flight number assigned to each flight. | | | Yes | | helps in identifying specific flights, which can be crucial for tracking historical delays associated with particular flight numbers and potentially uncovering patterns or trends. | | |
| **ORIGIN\_AIRPORT\_ID** | The unique identifier for the airport where the flight originates. | | | No | | different airports have varying traffic volumes, weather patterns, and operational efficiencies, all of which can significantly impact departure times and delays. | | |
| **ORIGIN** | Machine learning framework designed to predict flight delays by analyzing historical data and real-time factors. | | | Yes | | By leveraging diverse data sources and advanced algorithms, ORIGIN enhances the accuracy of delay predictions, enabling airlines and passengers to make informed decisions. | | |
| **ARR\_TIME** | | the actual arrival time of a flight at its destination. | | No | | | It allows for the comparison of the scheduled arrival time with the actual arrival time, which directly indicates the presence and extent of any delay. | |
| **ARR\_DELAY** | | the actual arrival delay in minutes for a flight. | | No | | | It a crucial metric for predicting and understanding flight punctuality and delays. | |
| **ARR\_DEL15** | | Indicates whether a flight's arrival was delayed by 15 minutes or more. | | No | | | which are crucial for analyzing and improving flight punctuality and passenger satisfaction. | |
| **CANCELED** | | indicating the scheduled flight will not depart. | | No | | | Flights can be cancelled due to severe weather conditions, mechanical issues, or other unforeseen circumstances that prevent safe operation. | |
| **DIVERTED** | | | advanced machine learning model for predicting in-flight delays by analyzing real-time flight data and environmental factors. | | No | | | enhance operational efficiency and passenger satisfaction by allowing airlines to proactively manage schedules and resources. |
| **ACTUAL\_ELAPSED\_TIME** | | | represents the scheduled duration of a flight from departure to arrival. | | No | | | it helps to compare actual flight duration against the scheduled time, aiding in identifying deviations and patterns that may indicate delays. |
| **DISTANCE** | | | refers to the length of the flight path between the | | No | | | Longer distances generally increase the potential for various delays due to extended exposure to weather changes, air traffic control, and operational issues. |