SPACE X CAPSTONE PROJECT

IBM DATA SCIENCE PROFESSIONAL

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OUTLINE

- Executive Summary
- Introduction
- Methodology
- Results
  - Visualization – Charts
  - Dashboard
- Discussion
  - Findings & Implications
- Conclusion
- Appendix

EXECUTIVE SUMMARY

- Data Collection – Space X API & SPACE X WIKI
- Four ML Model are used -
  - Logistic Regression
  - SVM
  - Decision Tree Classifier
  - KNN
- Exported Data from SQL
- Project uses Folium Maps and Visualizations Methods
- The Accuracy Rate of Successful Landings – 83.33%

INTRODUCTION

- Aim – SPACE Y is about to compete with SPPACE X
- Service – Commercial Space Carrier
- Problem – To tackle the landings failure using Data Science
- Solution -
  - Study and Analyze SPACE X DATA
  - Calculate the findings and Deploy the Solutions at SPACE Y.

METHODOLOGY

- Data Collection
- Data Wrangling
- Data Visualization with EDA
- EDA with SQL
- Interactive Mapping with Folium
- Data Visualizations with Plotly & Dash
- Classification Using ML

DATA COLLECTION SPACE X API

- Data Collection is done by using SPACE X API.
- Refer following Link
- SPACE X API for Data Collection

DATA COLLECTION – WEB SCRAPING

- Data Collection is done by using web scraping.
- Refer following Link
- DATA COLLECTION - WEB SCRAPING

DATA VISUALIZATIONS USING EDA

- Data Visualization is done using Exploratory Data Analysis
- Refer following Link
- Data Visualization with EDA

EDA WITH SQL

- The EDA operation is also done with SQL.
- Refer following Link
- EDA WITH SQL

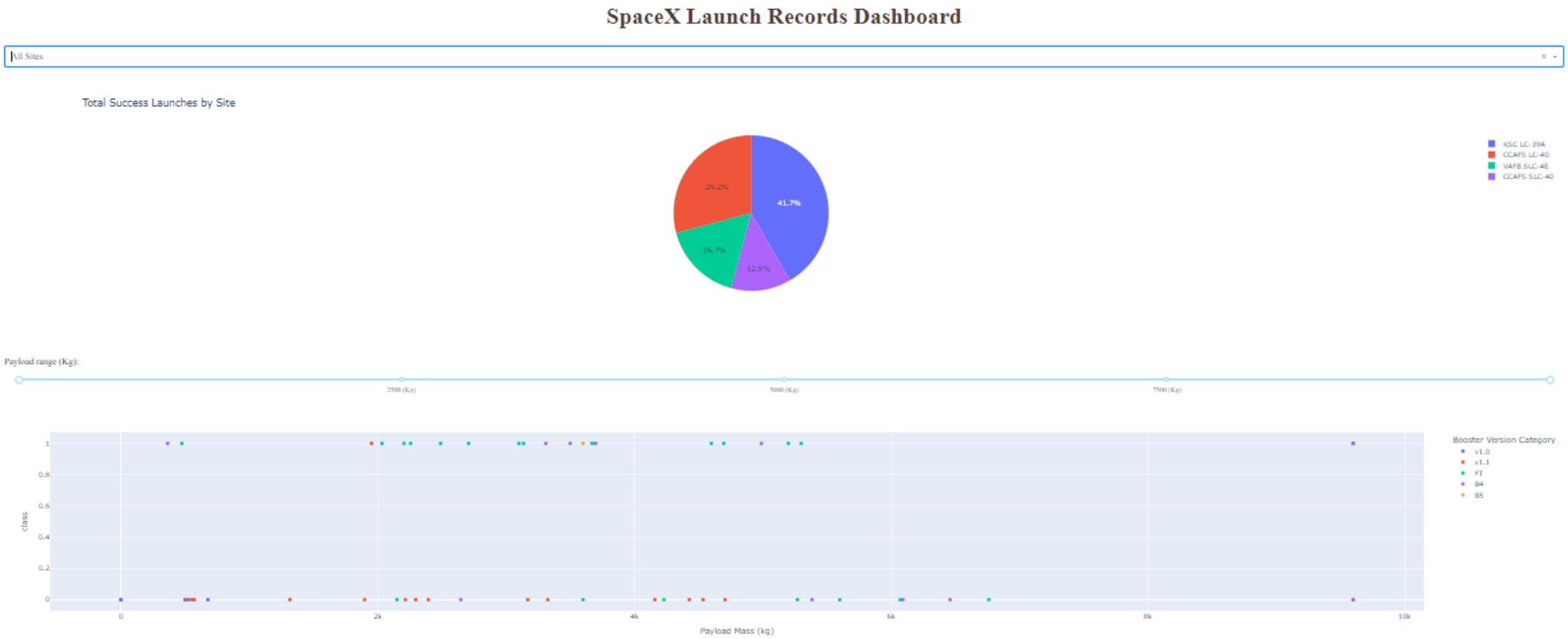
INTERACTIVE MAPPING WITH FOLLIUM

- We have used Follium in order to detect the launch site locations
- Refer following Link
- LAUNCH SITE LOCATIONS USING FOLLIUM

DASHBOARD WITH PLOTLY & DASH

- The dashboard is generated with Plotly and Dash in VS CODE environment.
- Refer following Link
- DASHBOARD WITH PLOTLY AND DASH

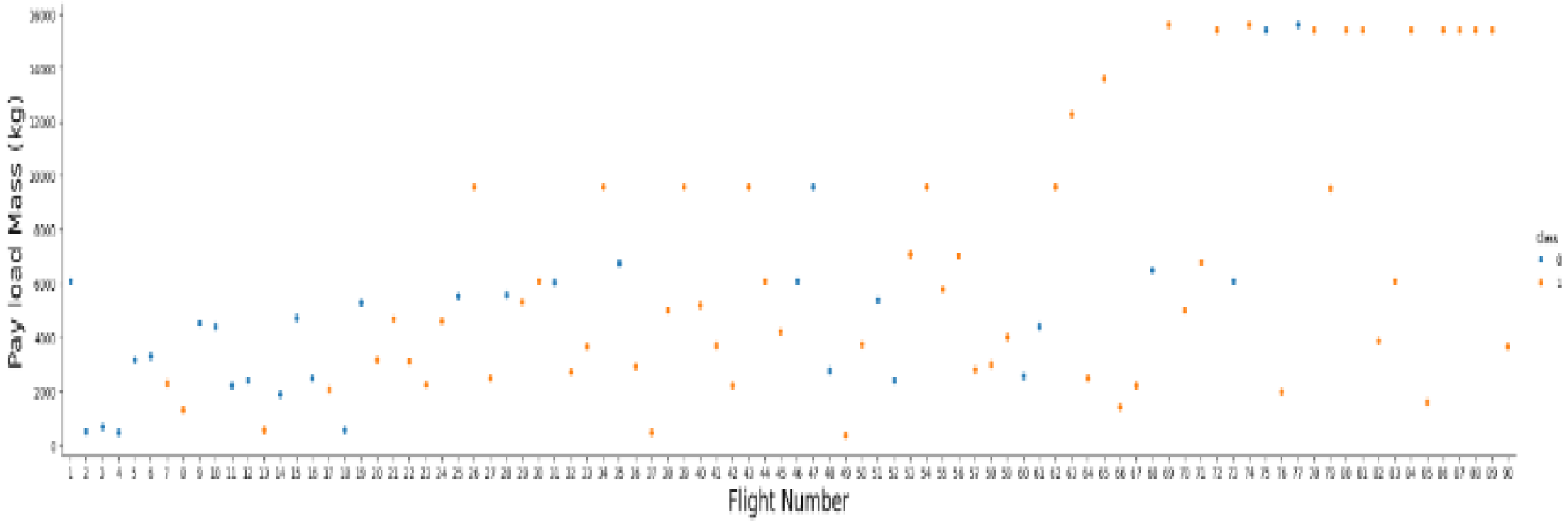
THE DASHBOARD



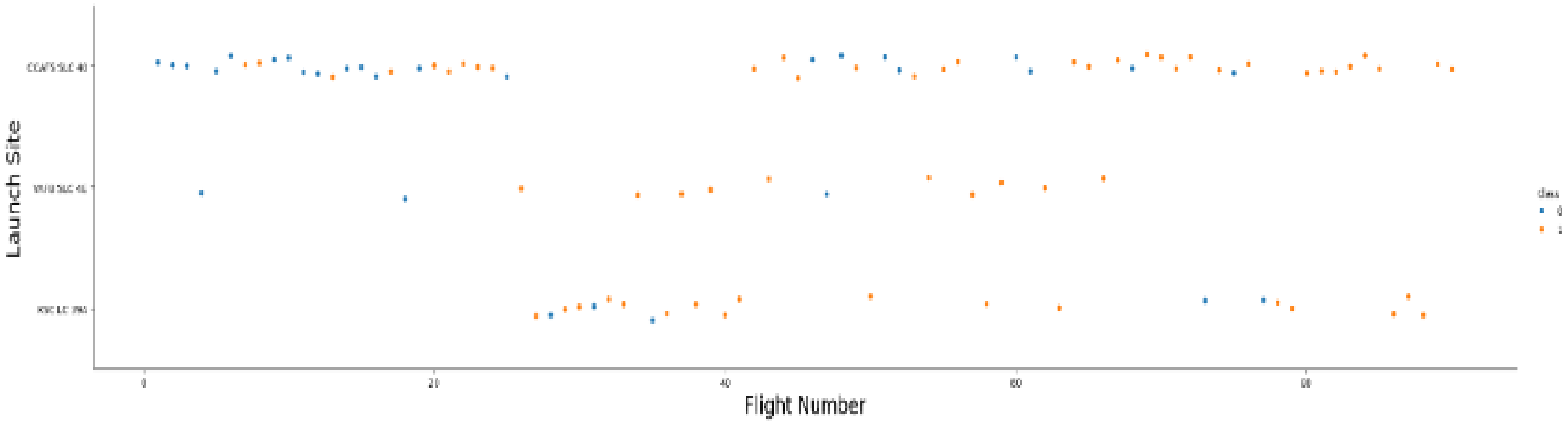
ML PREDICTIVE ANALYSIS

- The ML classification methods have used for predictions.
- Methods – Logistic Regression, SVM, Decision Tree Classifier & KNN
- Refer following Link
- ML PREDICTIONS USING CLASSIFICATION

RESULTS – EDA WITH VISUALIZATIONS



RESULTS – EDA WITH VISUALIZATIONS



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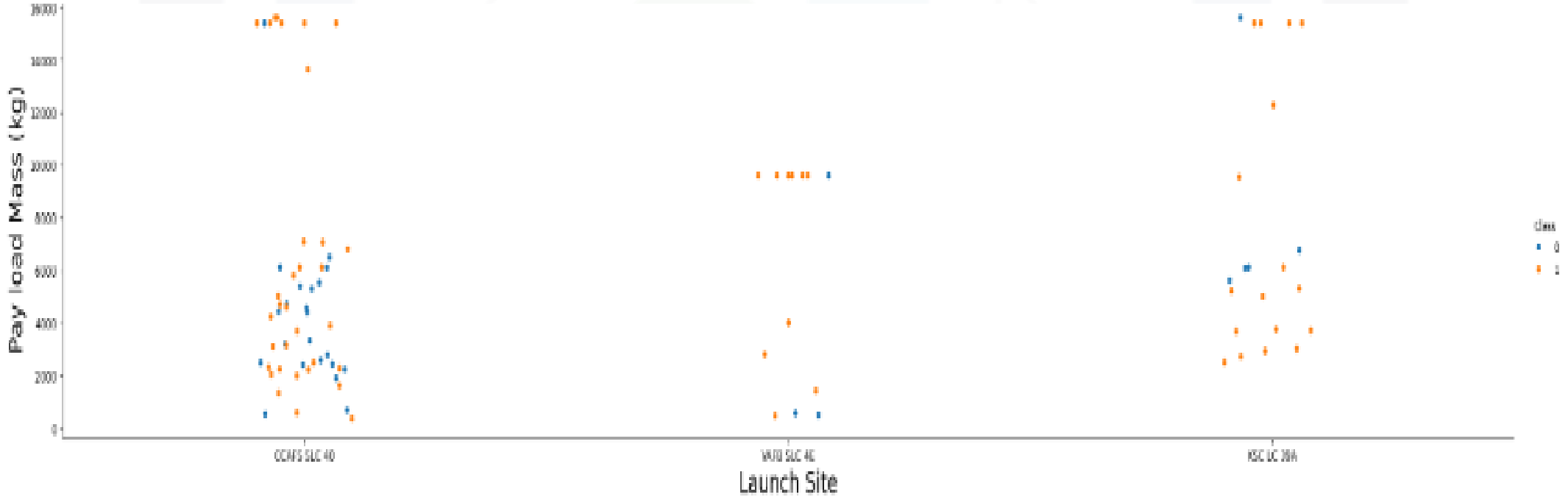

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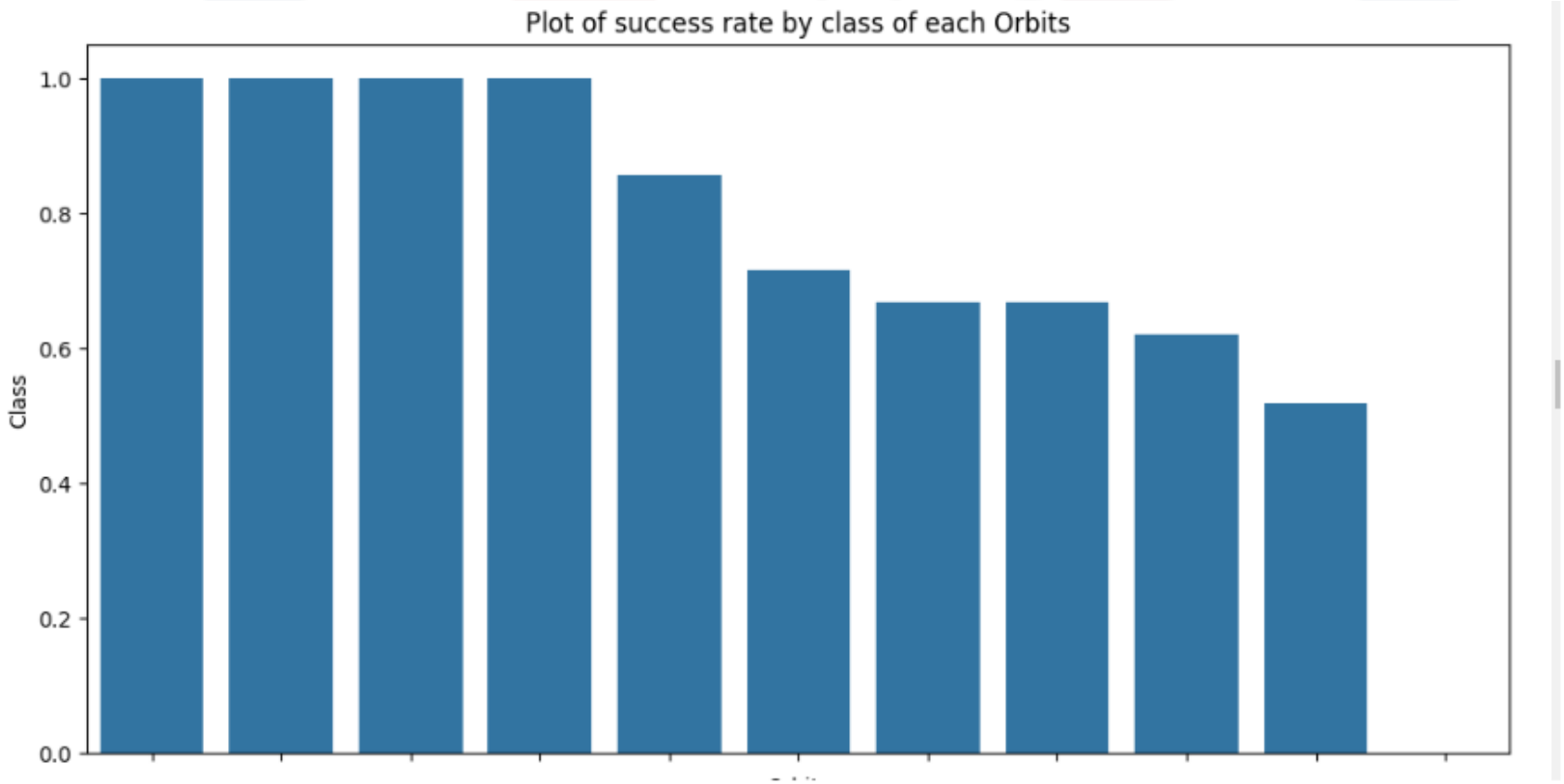

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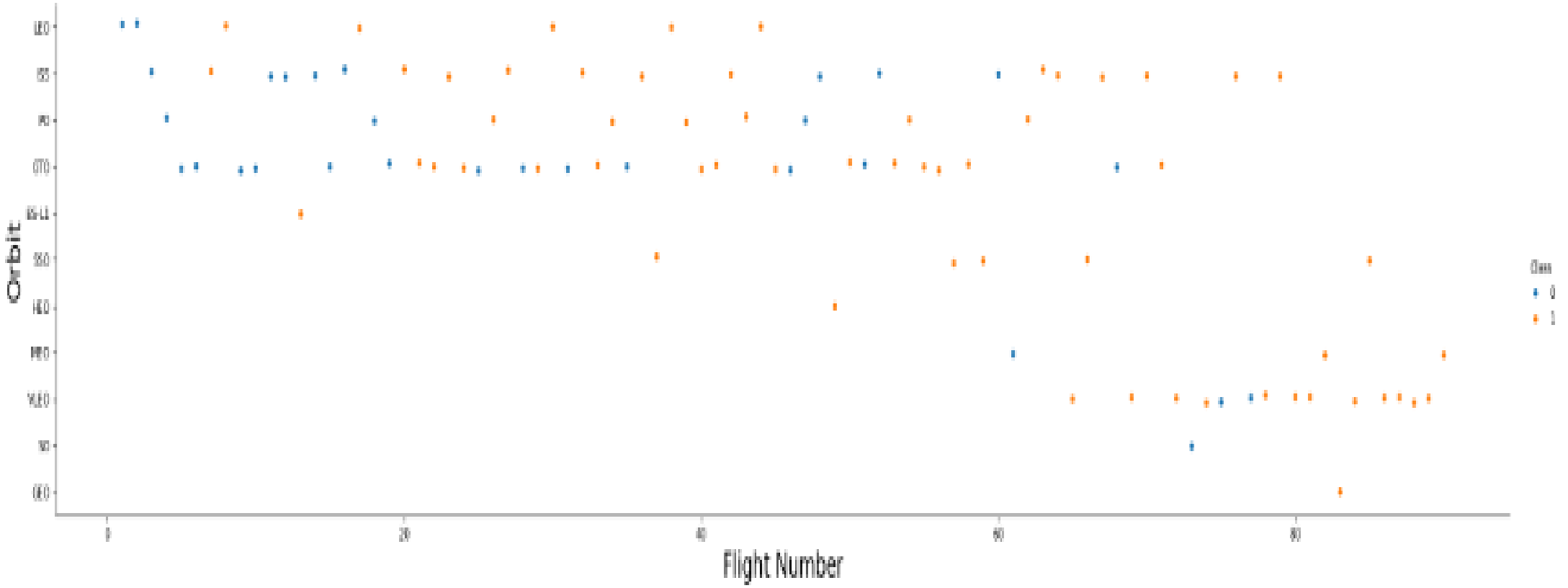

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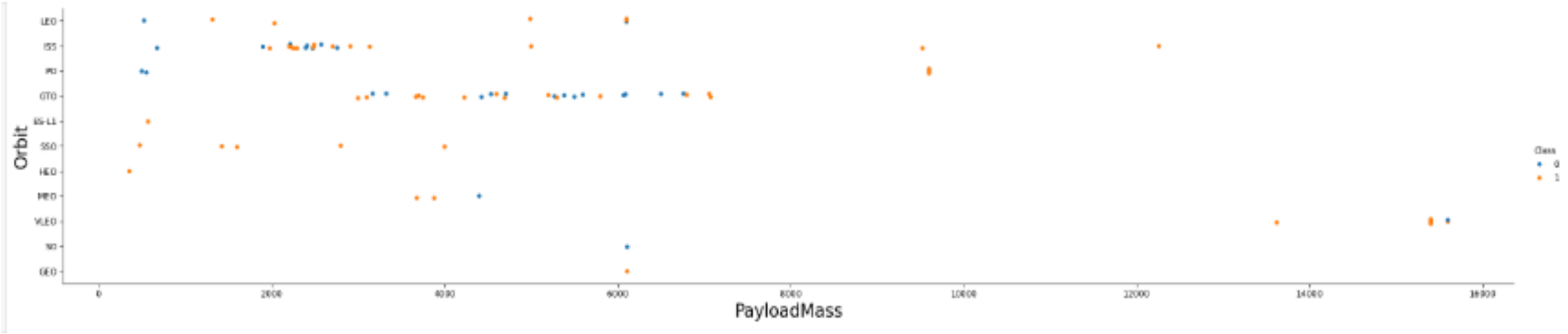

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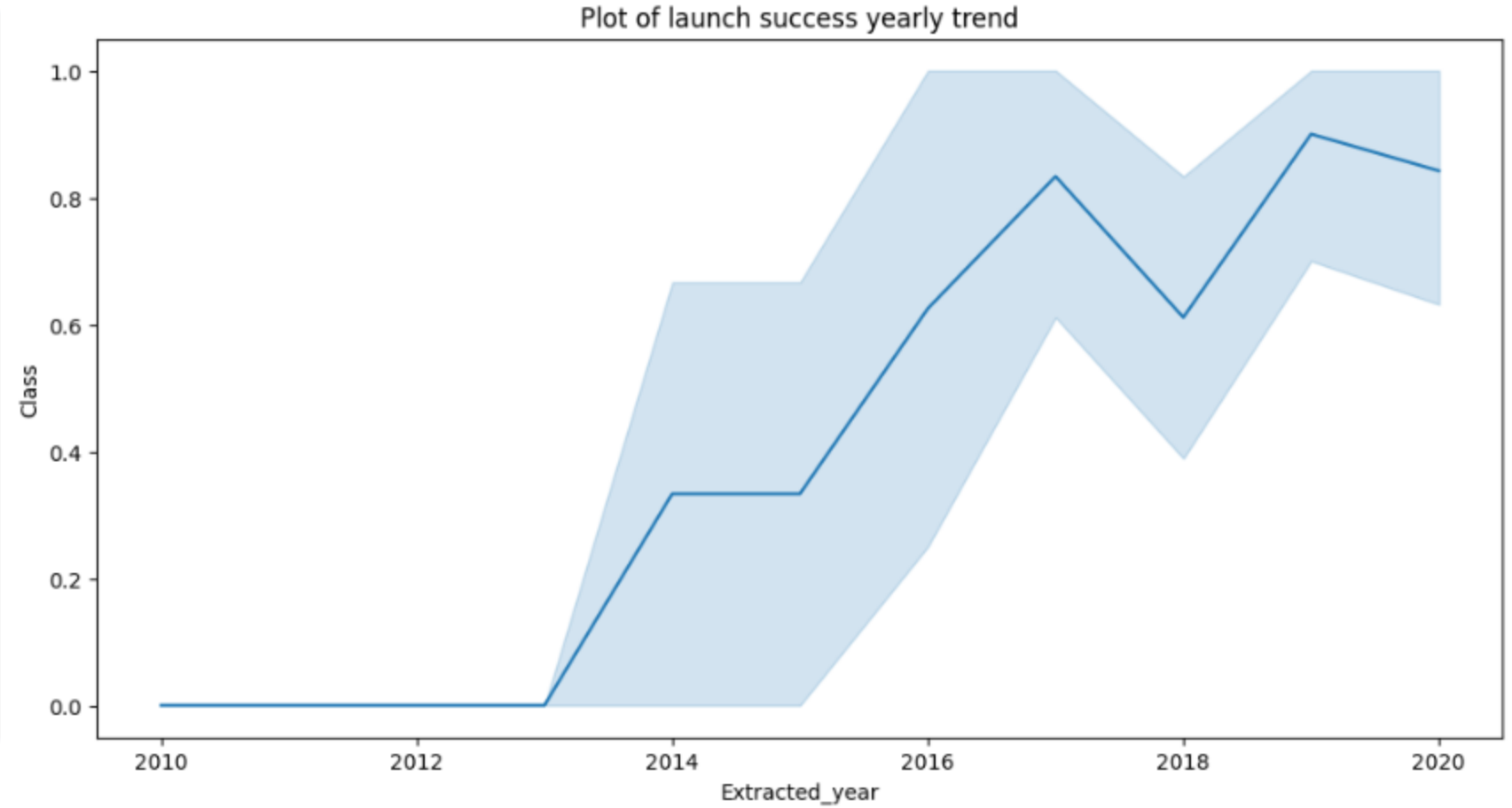
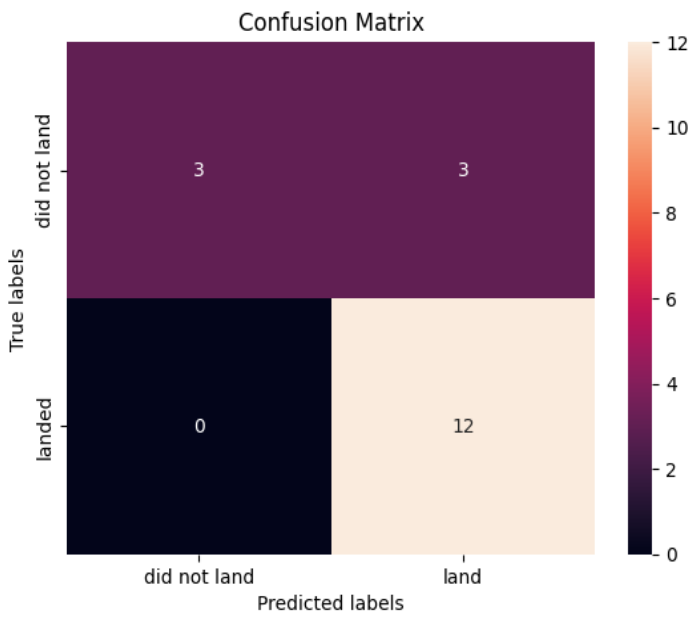


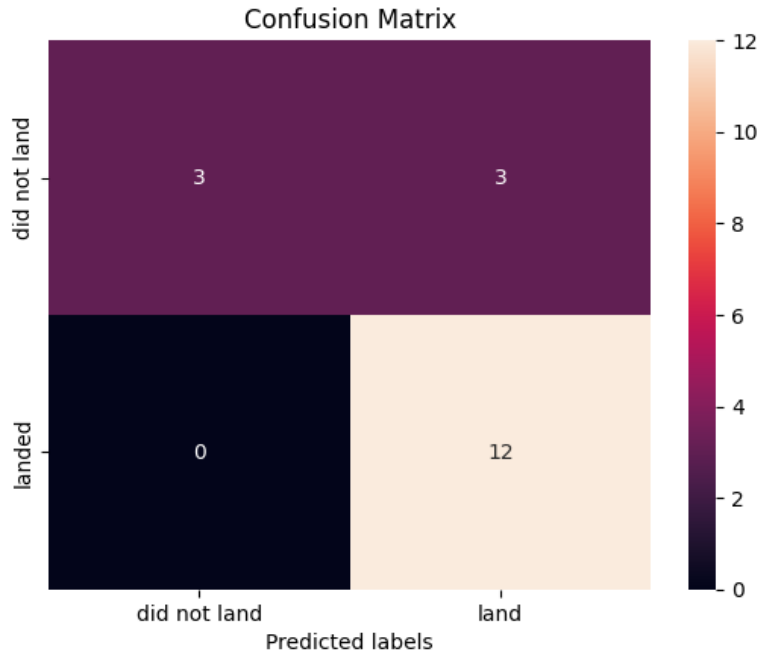
RESULTS – EDA WITH SQL

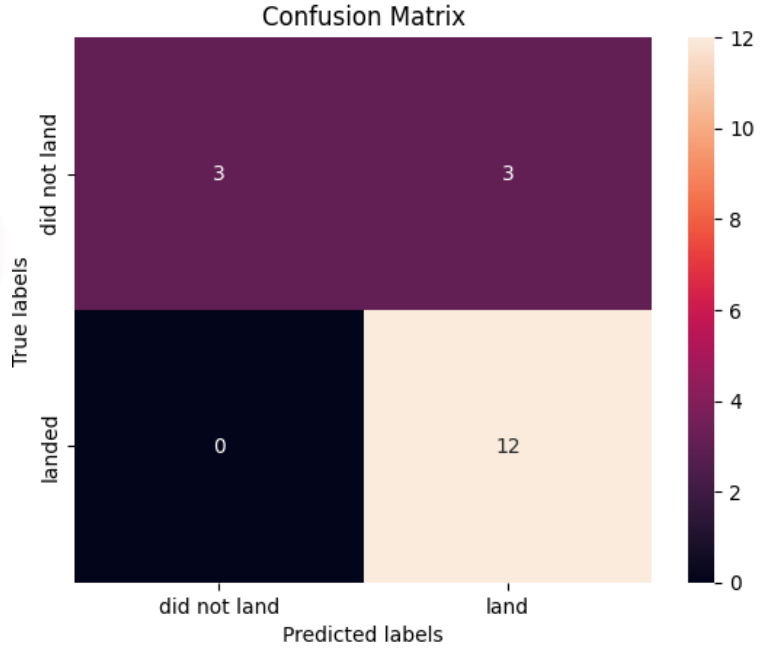
- Launch Sites - CCAFS LC- 40, VAFB SLC- 4E, KSC LC- 39 A, CCAFS SLC- 40
- Total payload mass carried by boosters launched by NASA (CRS) - 45596
- Booster Version F9 v1.1 Average Payload Mass – 2534.66
- First Successful Launch Date – 06/04/2010
- Successful Boosters for Payload between 4000 to 6000
  - F9 FT B1022
  - F9 FT B1026
  - F9 FT B1021.2
  - F9 FT B1031.2
- Total Successful Missions – 98
- There are total 10 boosters who have maximum payload capacity.

RESULTS – MAPPING WITH FOLLIUM

RESULTS – ML PREDICTION







OVERALL FINDINGS

- The best fit ML model is Decision Tree.
- The accuracy score for Decision Tree is 0.8892.
- Allon Mask can use this model for prediction.

CONCLUSION

- Allon Mask can save 100 million USD.
- He can use this model for better accuracy.
- We can improve accuracy with more data.
- All the data is collected by using SPACE X API AND Webscraping

APPENDIX

- PROJECT LINK
- Thanks to all the instructors.