

Capstone Project

Coursera

Executive Summary

- **Project Goal:**Analyze SpaceX launch data to gain insights and predict outcomes of future launches.
- **Data Collection:**Collected data from SpaceX API and public datasets.
- **Methodology:**Performed data wrangling, EDA, and built predictive models using machine learning techniques.
- **Key Findings:**Identified factors influencing launch success rates.
- Developed interactive dashboards for data visualization.
- **Outcome:**Successfully predicted launch outcomes with high accuracy.

Introduction

- **Project Overview:**

- This project aims to analyze SpaceX launch data to understand the factors affecting launch success and predict future launches.

- **Significance:**

- The analysis helps SpaceX and stakeholders make informed decisions and improve launch success rates.

- **Tools and Libraries:**

- **Python Libraries:**

- pandas, numpy, matplotlib, seaborn for data wrangling and visualization.
- sklearn for machine learning models.
- plotly, dash, folium for interactive visualizations.

- **GitHub:**

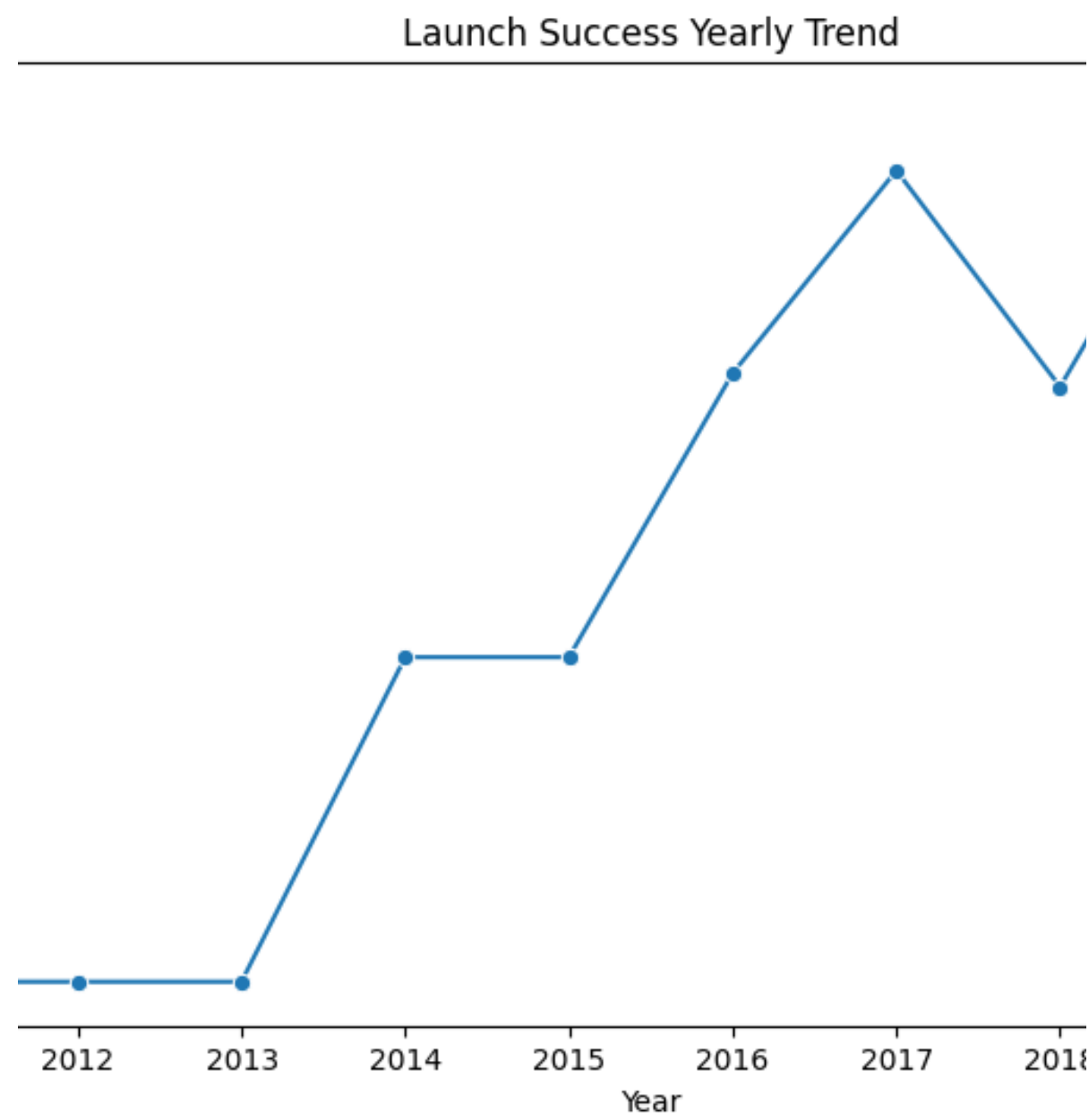
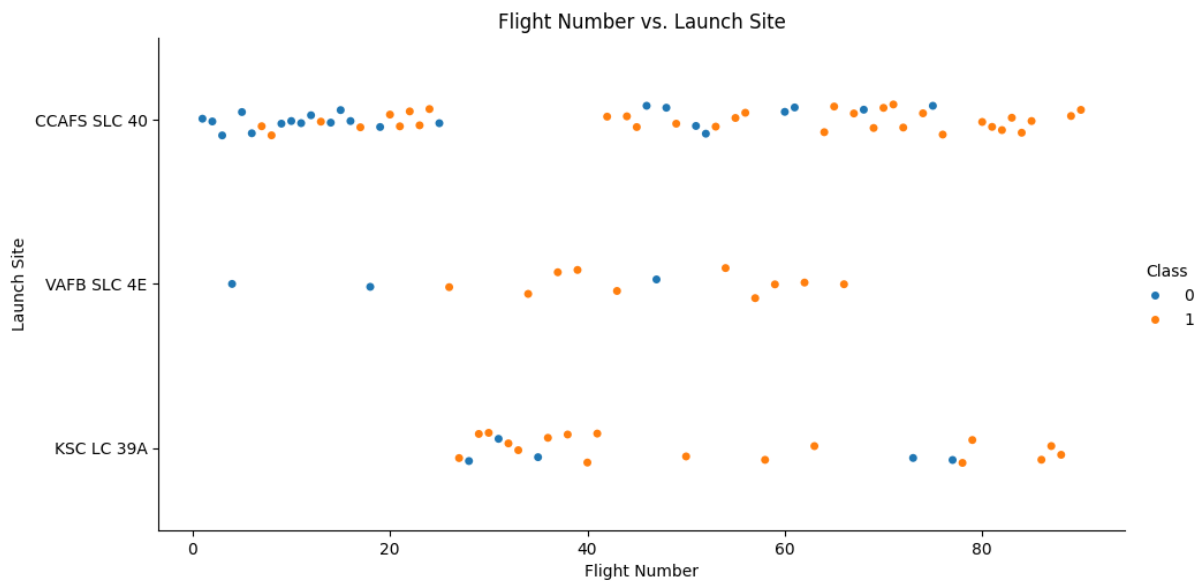
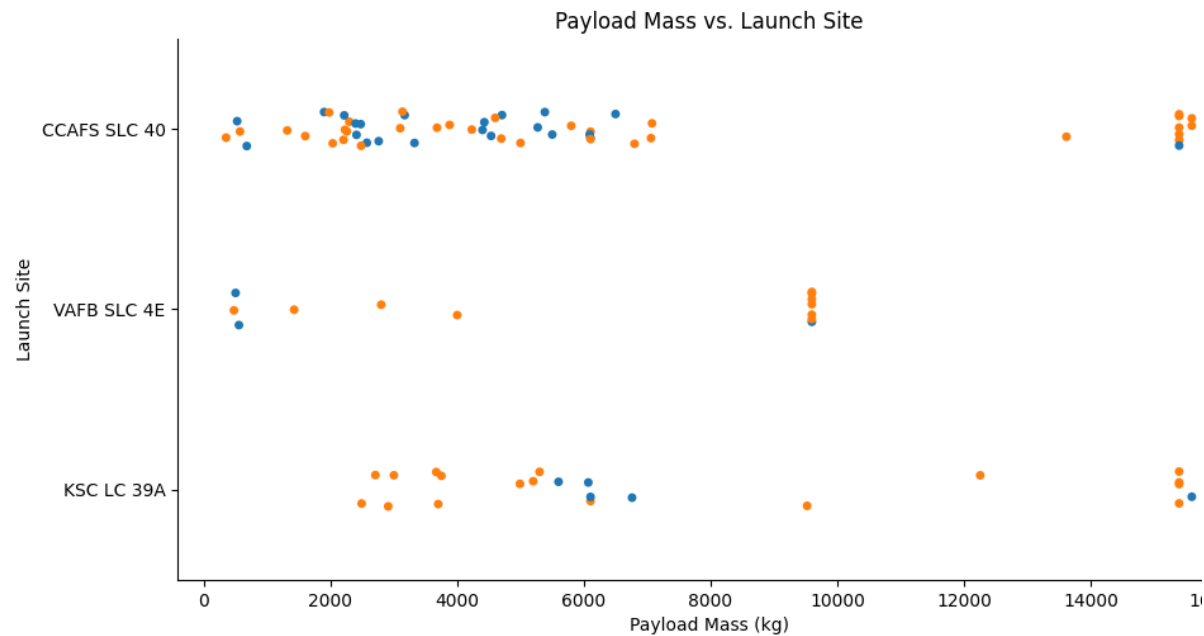
- Repository for sharing and collaboration.

Data Wrangling Methodoloty

- **Data Sources:**SpaceX API
- Public datasets
- **Data Wrangling Steps:**Loaded datasets using pandas.
- Cleaned and transformed data for analysis.
- Merged and integrated multiple data sources.

EDA with Visualization

- **Exploratory Data Analysis:** Visualized data distributions and relationships using matplotlib and seaborn.
- **Key Insights:** Identified significant features influencing launch success.

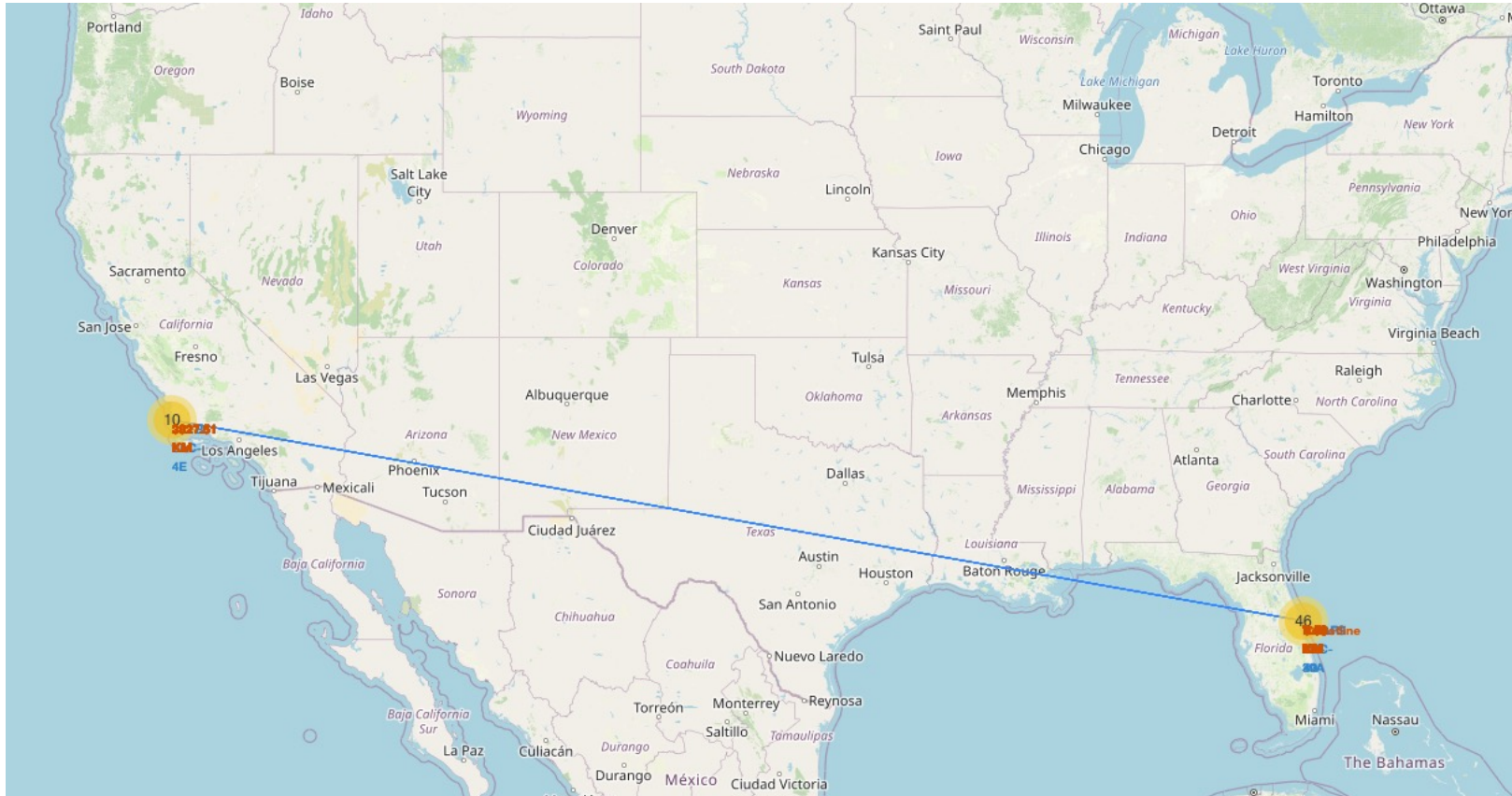


EDA with SQL

	Landing_Outcome	count
0	Controlled (ocean)	5
1	Failure	3
2	Failure (drone ship)	5
3	Failure (parachute)	2
4	No attempt	21
5	No attempt	1
6	Precluded (drone ship)	1
7	Success	38
8	Success (drone ship)	14
9	Success (ground pad)	9
10	Uncontrolled (ocean)	2

	Landing_Outcome	Outcome_Count
0	Failure (drone ship)	5
1	Success (ground pad)	3

Interactive map with Folium



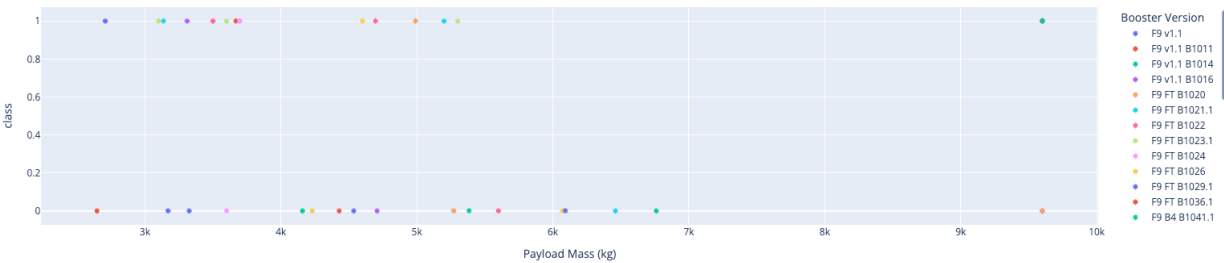
Plotly Dash dashboard



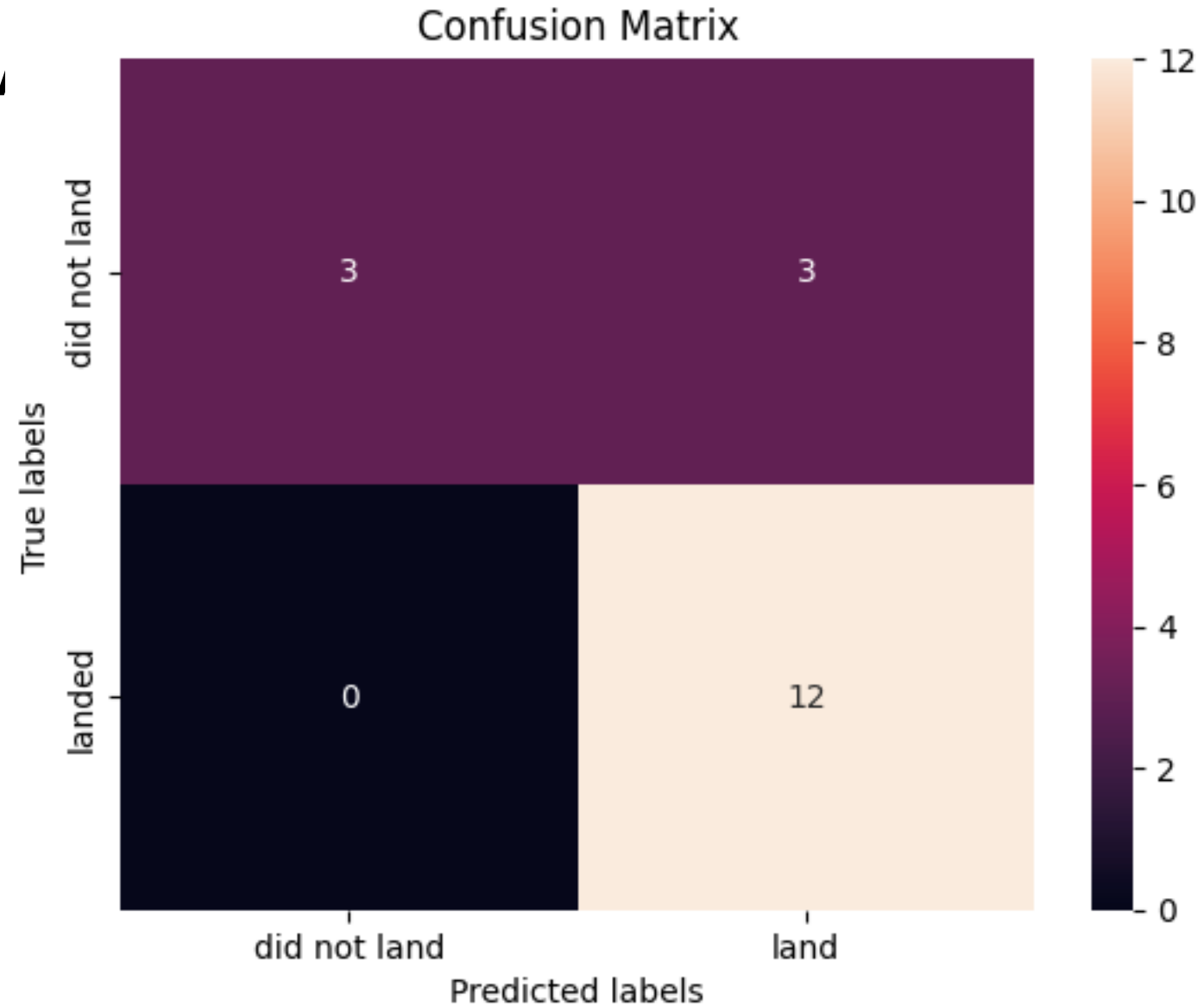
Total Success Launches By Site



Payload vs. Outcome for All Sites



Predictiv



The best performing method is: Logistic Regression with an accuracy of 0.8333333333333334

Conclustion

- **Summary of Findings:**Successfully analyzed SpaceX launch data.
- Developed models with high accuracy for predicting launch success.
- **Implications:**The insights gained can help improve future launch outcomes and operational efficiency.