Rocket

BID AGAINST SPACEX

Executive Summary

Summary of methodologies:

- Data collection and wrangling
- SQL
- Visualization
- Predictive Analysis

Summary of Results:

- Whether the first stage will land can be predicted with a relatively high accuracy

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Introduction

Falcon 9 first stage will land successfully and costs less than other providers.

Questions:

1. What is the price of each launch?
2. If SpaceX will reuse the first stage?

Methodology – Data Collection and Wrangling

1. Request Data from API -> Turn data from .json to dataframe -> Clean data -> save to csv files

2. Get Data by web scraping -> Turn data from html to dataframe -> Clean data -> save to csv files

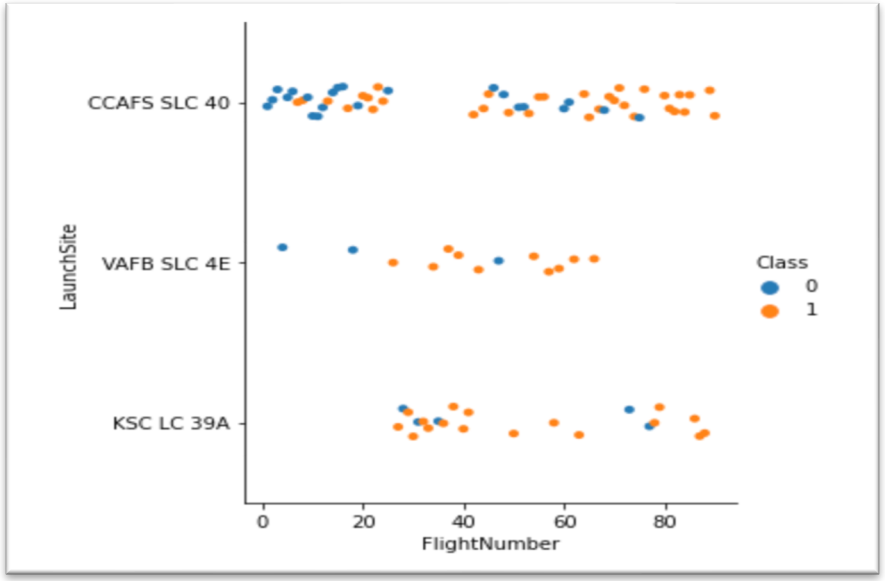
Methodology – EDA and Interactive Visual Analytics

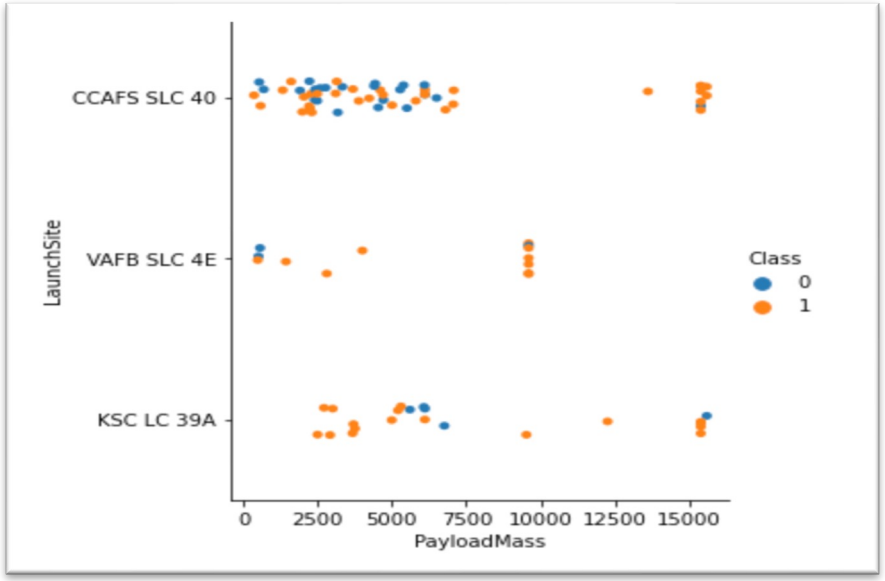
1. Explore the sites and orbits of launches, giving a label of success
2. Visualize the relationship between flight number, payload and launch site
3. Visualize the relationship between flight number, payload and orbit type
4. Visualize the launch success yearly trend
5. Use Folium to mark launch sites and calculate the distances

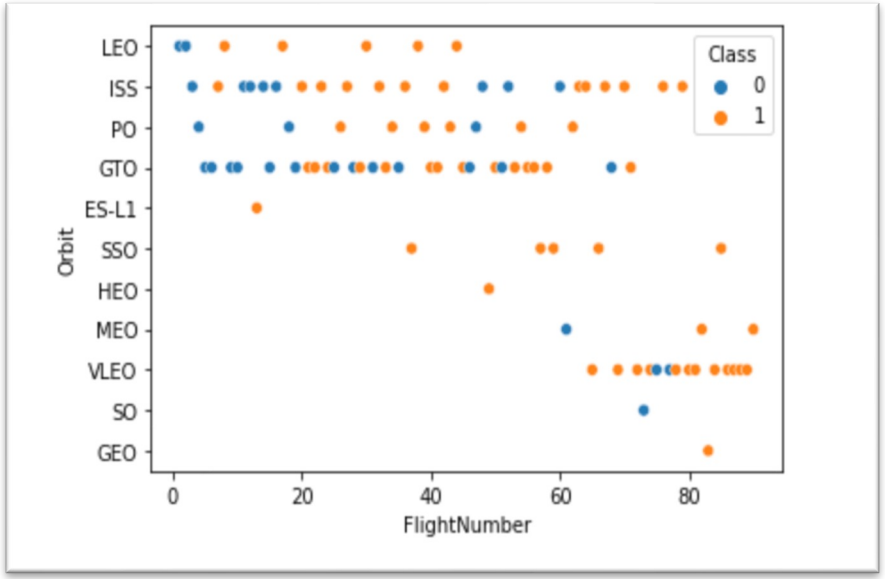
Methodology – Predictive Analysis

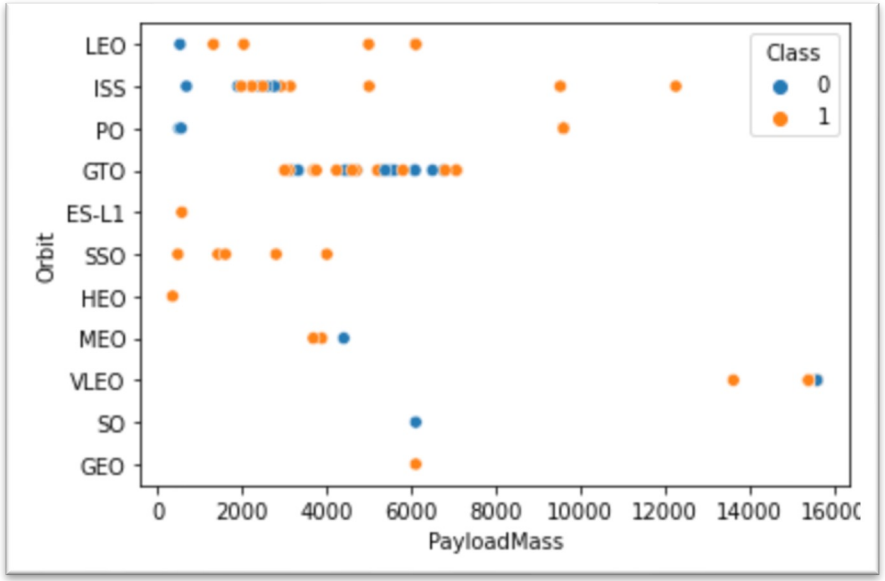
1. Handle data for preparation
2. Build modes: logistic regression, SVM, decision tree, K-nearest neighbor
3. Use score to compare the better model

Results – EDA with Visualization









Results – EDA with SQL

```
%sql SELECT DISTINCT LAUN
```

```
 * ibm_db_sa://gvy02842:**
Done.
```

Launch_Sites
CCAFS LC-40
CCAFS SLC-40
KSC LC-39A
VAFB SLC-4E

```
%sql SELECT DATE, BOOSTER_VERSION, I
```

```
 * ibm_db_sa://gvy02842:***@55fbc997
Done.
```

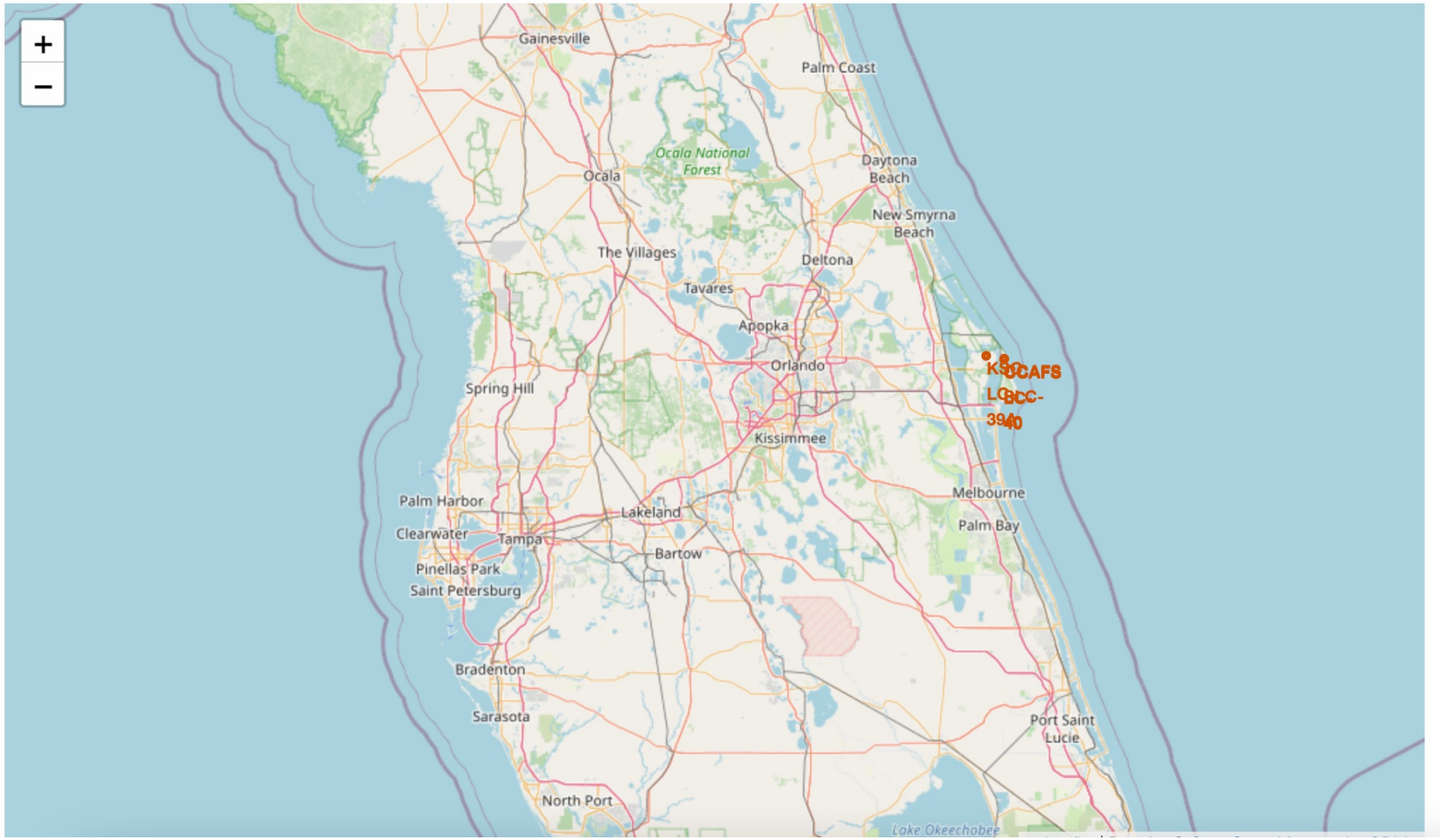
DATE	booster_version	launch_site
2015-01-10	F9 v1.1 B1012	CCAFS LC-40
2015-04-14	F9 v1.1 B1015	CCAFS LC-40

```
%sql SELECT LANDING__OUTCOME, COUN
```

```
 * ibm_db_sa://gvy02842:***@55fbc99
Done.
```

landing__outcome	landing_count
No attempt	10
Failure (drone ship)	5
Success (drone ship)	5
Controlled (ocean)	3
Success (ground pad)	3
Failure (parachute)	2
Uncontrolled (ocean)	2
Precluded (drone ship)	1

Results – Interactive map with Folium



Results – Predictive Analysis

```
print("tuned hpyerparameters :(best parameters) ",logreg_cv.best_params_)
print("accuracy :",logreg_cv.best_score_)
```

```
tuned hpyerparameters :(best parameters)  {'C': 0.01, 'penalty': 'l2', 'solver': 'lbfgs'}
accuracy : 0.8464285714285713
```

```
print("tuned hpyerparameters :(best parameters) ",svm_cv.best_params_)
print("accuracy :",svm_cv.best_score_)
```

```
tuned hpyerparameters :(best parameters)  {'C': 1.0, 'gamma': 0.03162277660168379, 'kernel': 'sigmoid'}
accuracy : 0.8482142857142856
```

```
print("tuned hpyerparameters :(best parameters) ",tree_cv.best_params_)
print("accuracy :",tree_cv.best_score_)
```

```
tuned hpyerparameters :(best parameters)  {'criterion': 'entropy', 'max_depth': 14
mples_split': 10, 'splitter': 'random'}
accuracy : 0.8892857142857145
```

```
print("tuned hpyerparameters :(best parameters) ",knn_cv.best_params_)
print("accuracy :",knn_cv.best_score_)
```

```
tuned hpyerparameters :(best parameters)  {'algorithm': 'auto', 'n_neighbors': 10, 'p': 1}
accuracy : 0.8482142857142858
```

Conclusion

All models used have a high accuracy to predict the landing outcome, among with Decision Tree performs the best.

Thank you for watching.