

# Falcon 9 First Stage Landing Predictor

## Problem:

Can we predict Falcon 9 first stage landing success using payload, orbit, and launch site data?

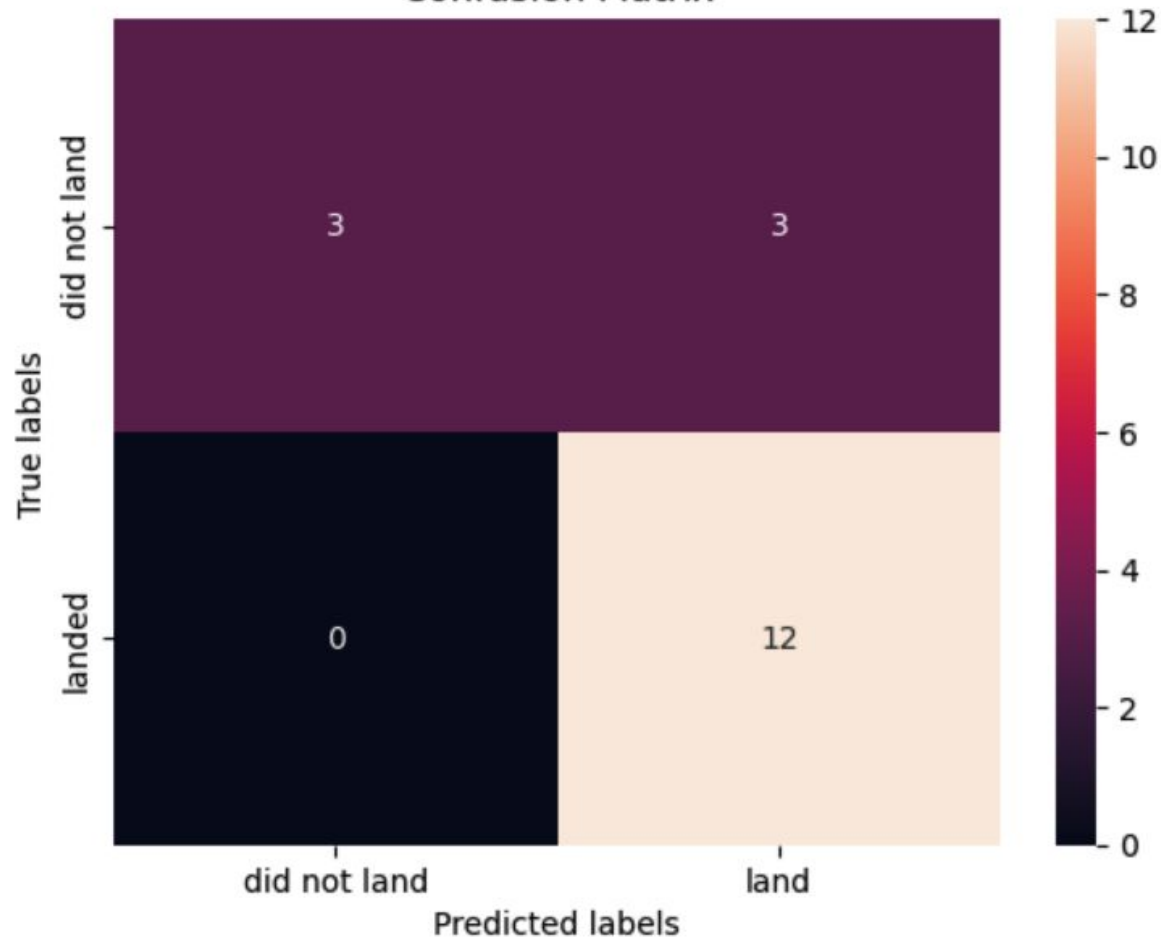
Tools: Python, Pandas, Scikit-learn, Plotly, Dash

# Data Pipeline & Modeling

- Collected launch data from SpaceX API and scraped metadata from Wikipedia
- Cleaned and merged datasets using Pandas
- Engineered features like payload mass, orbit type, and launch site
- Trained Logistic Regression, SVM, Decision Tree, and KNN
- Best model: Logistic Regression (F1: 89%, Precision: 92%, Recall: 87%)

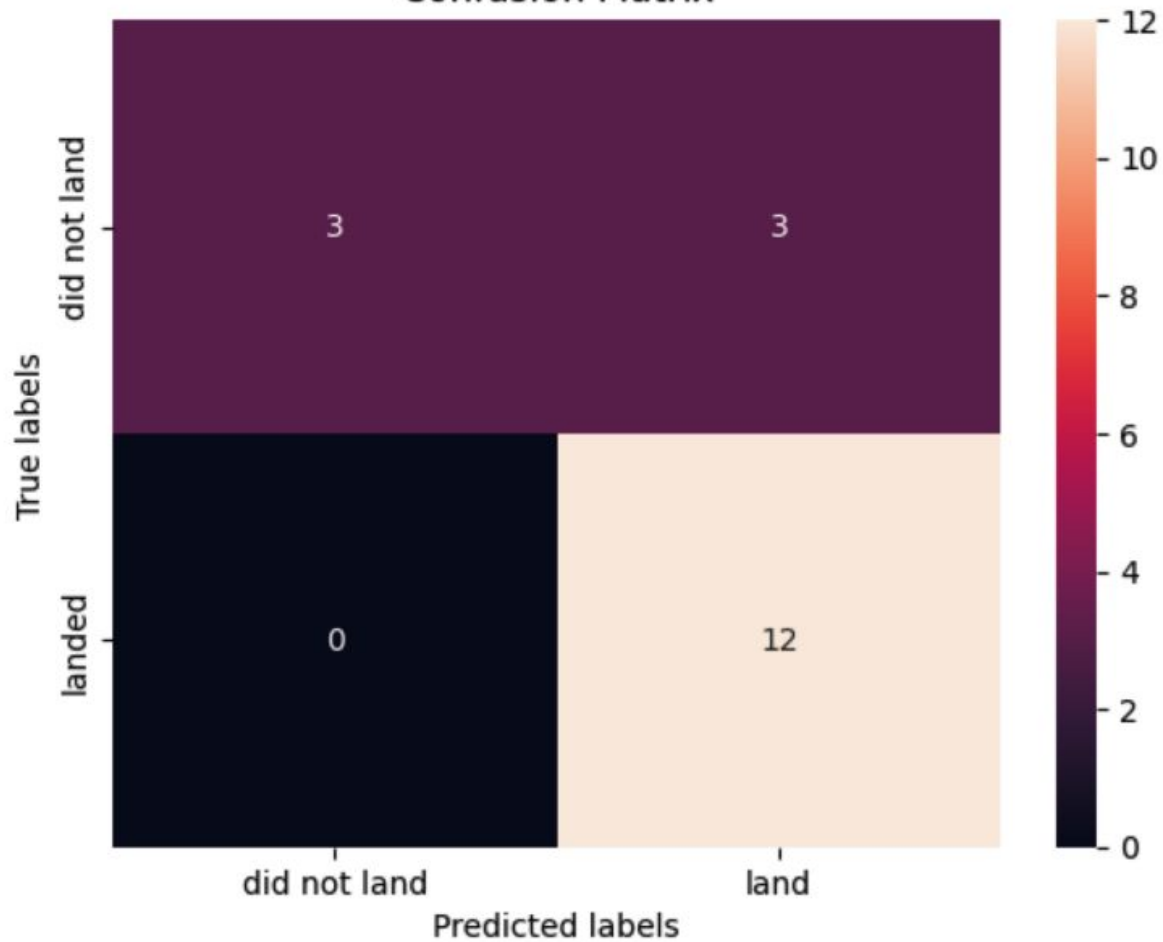
Logistic Regression Test Accuracy: 83.3%

Confusion Matrix



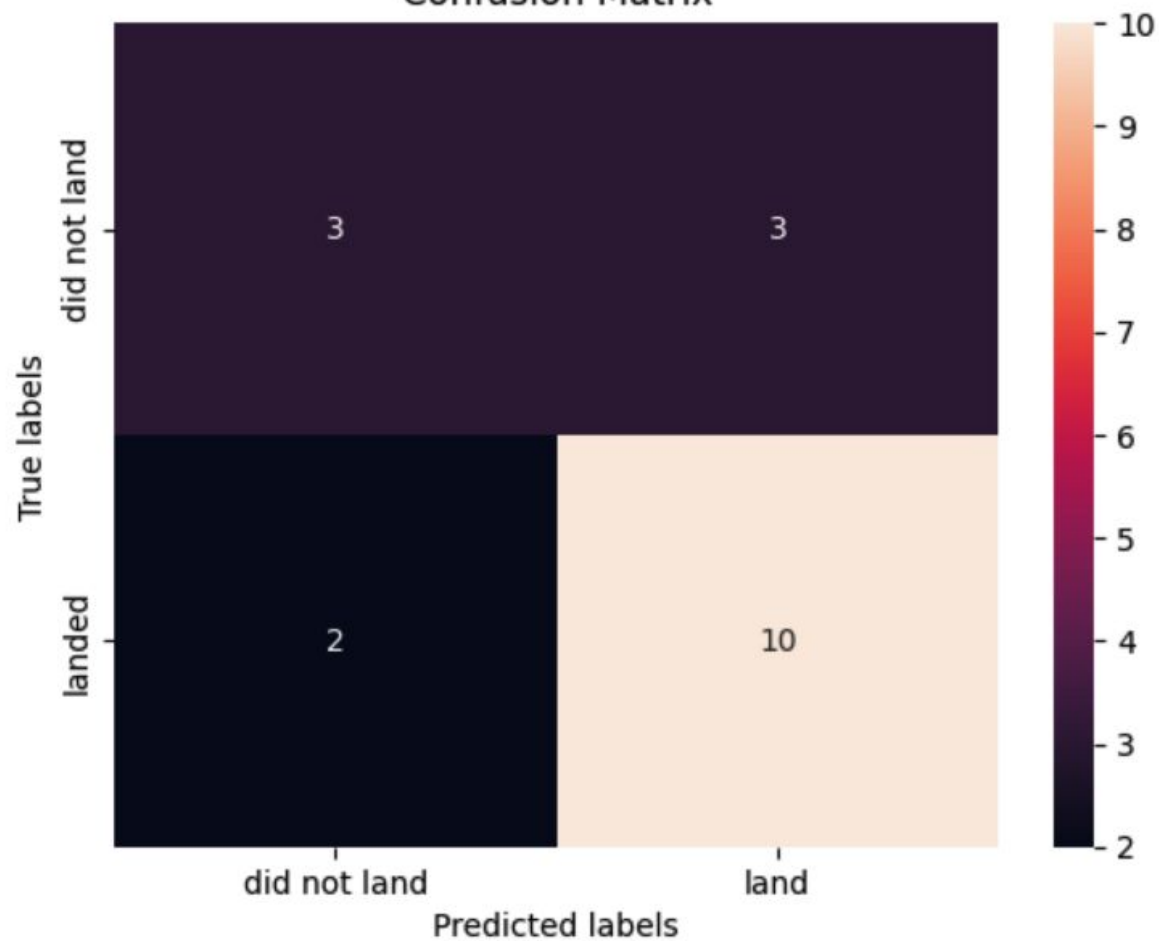
SVM Test Accuracy: 83.3%

Confusion Matrix



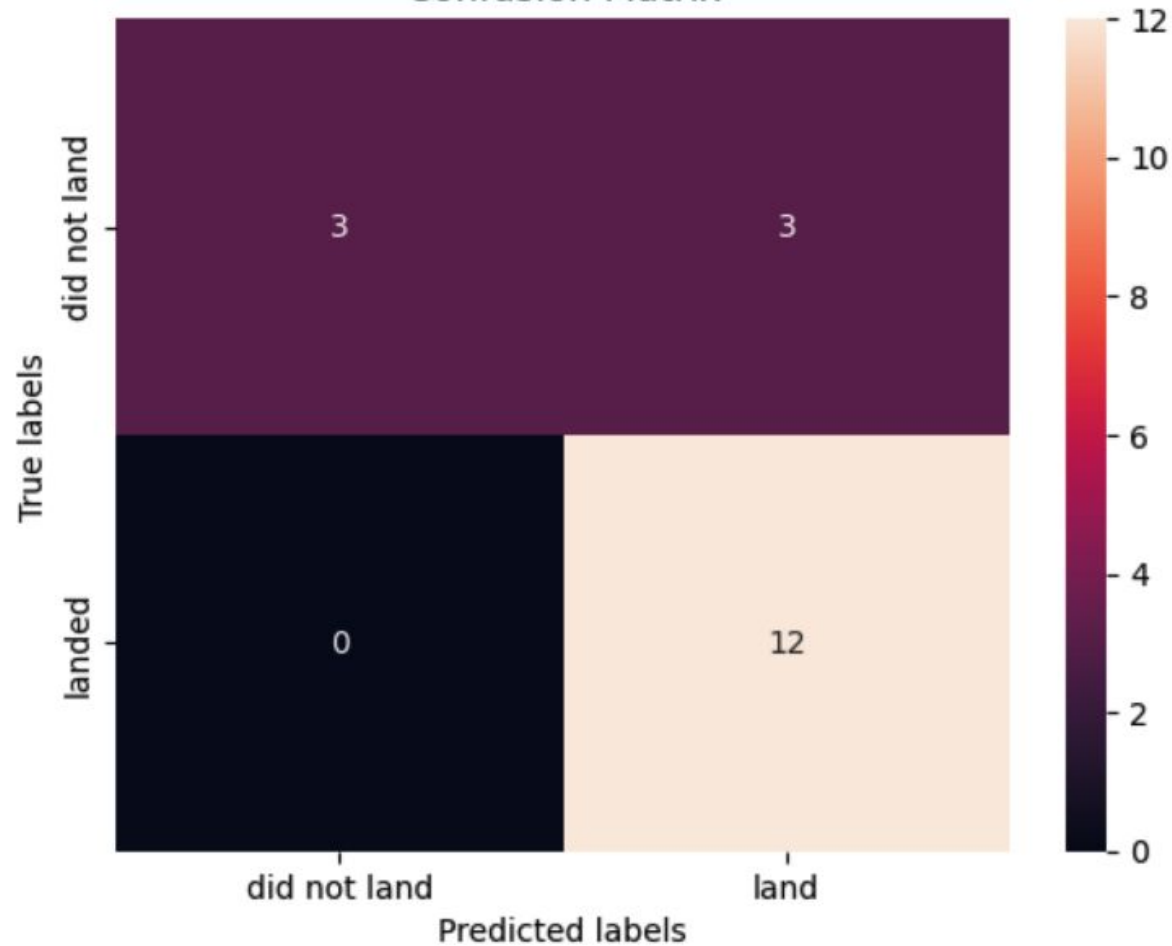
Decision Tree Test Accuracy: 72.2%

Confusion Matrix



KNN Test Accuracy: 83.3%

Confusion Matrix

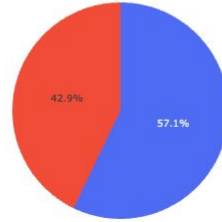


# SpaceX Launch Records Dashboard

CCAFS SLC-40

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Total Success vs Failure for site CCAFS SLC-40



0

1

Payload range (Kg):

0

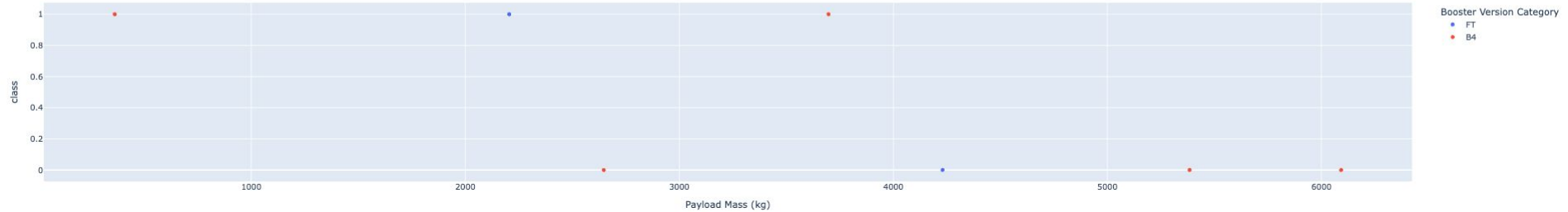
2500

5000

7500

10000

Correlation Between Payload and Success for site CCAFS SLC-40

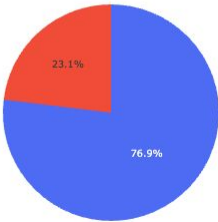


# SpaceX Launch Records Dashboard

KSC LC-39A

X

Total Success vs Failure for site KSC LC-39A



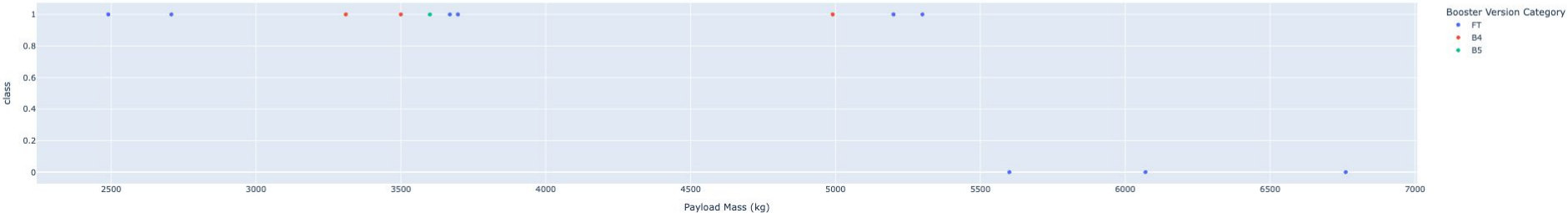
1

0

Payload range (Kg):



Correlation Between Payload and Success for site KSC LC-39A

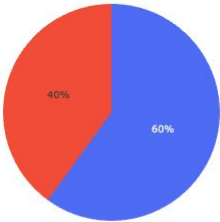




# SpaceX Launch Records Dashboard

VAFB SLC-4E

Total Success vs Failure for site VAFB SLC-4E



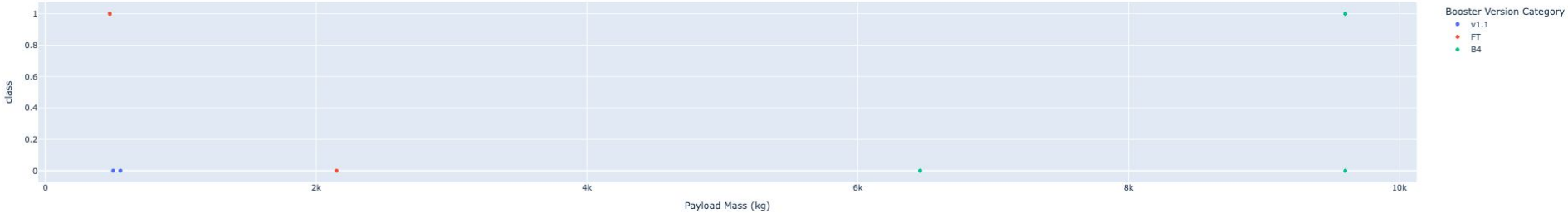
0

1

Payload range (Kg):



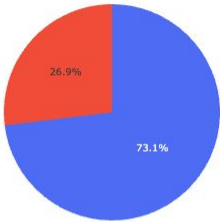
Correlation Between Payload and Success for site VAFB SLC-4E



# SpaceX Launch Records Dashboard

CCAFS LC-40

Total Success vs Failure for site CCAFS LC-40

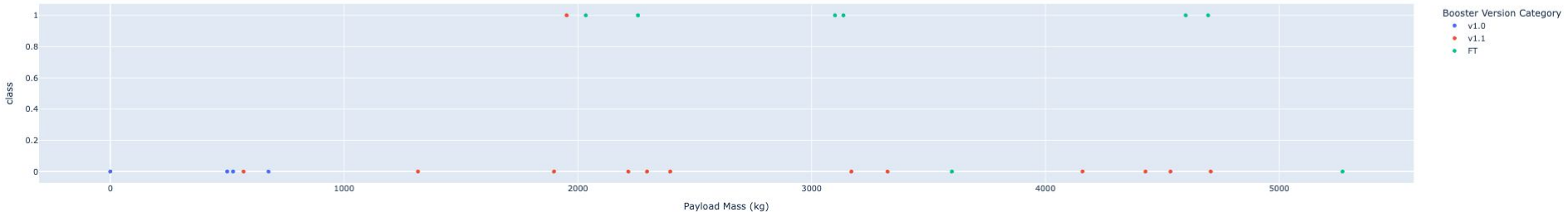


0  
1

Payload range (Kg):



Correlation Between Payload and Success for site CCAFS LC-40



# SpaceX Launch Records Dashboard

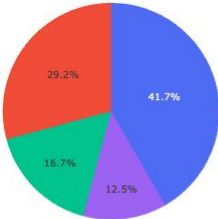
All Sites

X

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Total Successful Launches by Site



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

Payload range (Kg):

0

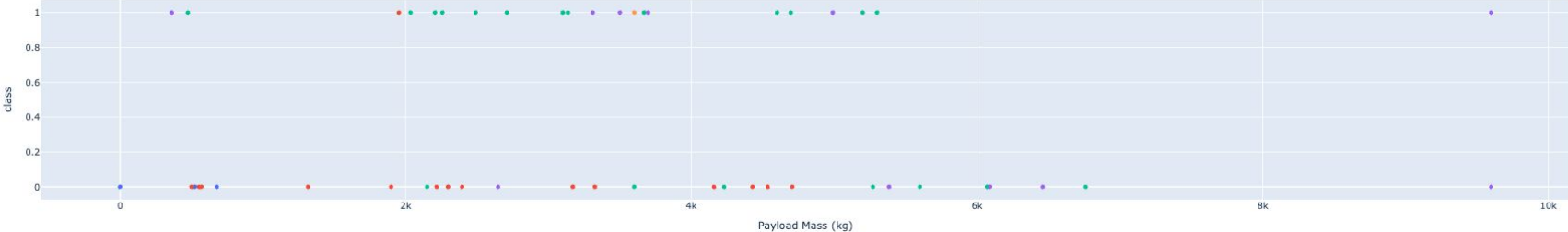
2500

5000

7500

10000

Correlation Between Payload and Success for All Sites



- Booster Version Category
- v1.0
- v1.1
- FT
- B4
- B5