

Predicting Flight Delays

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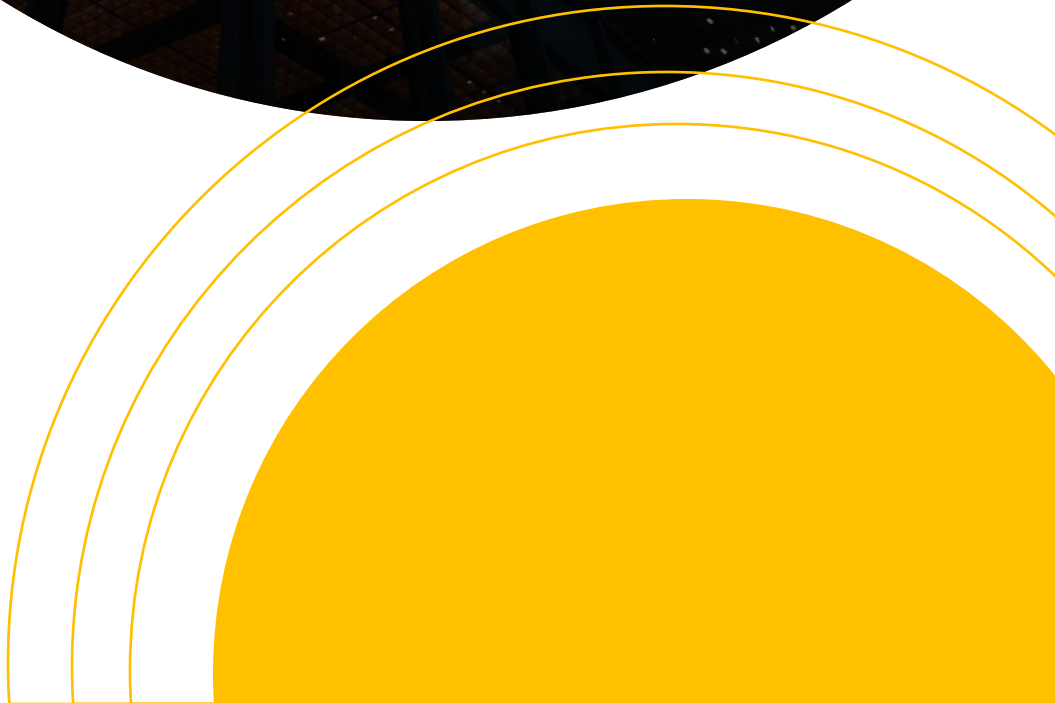


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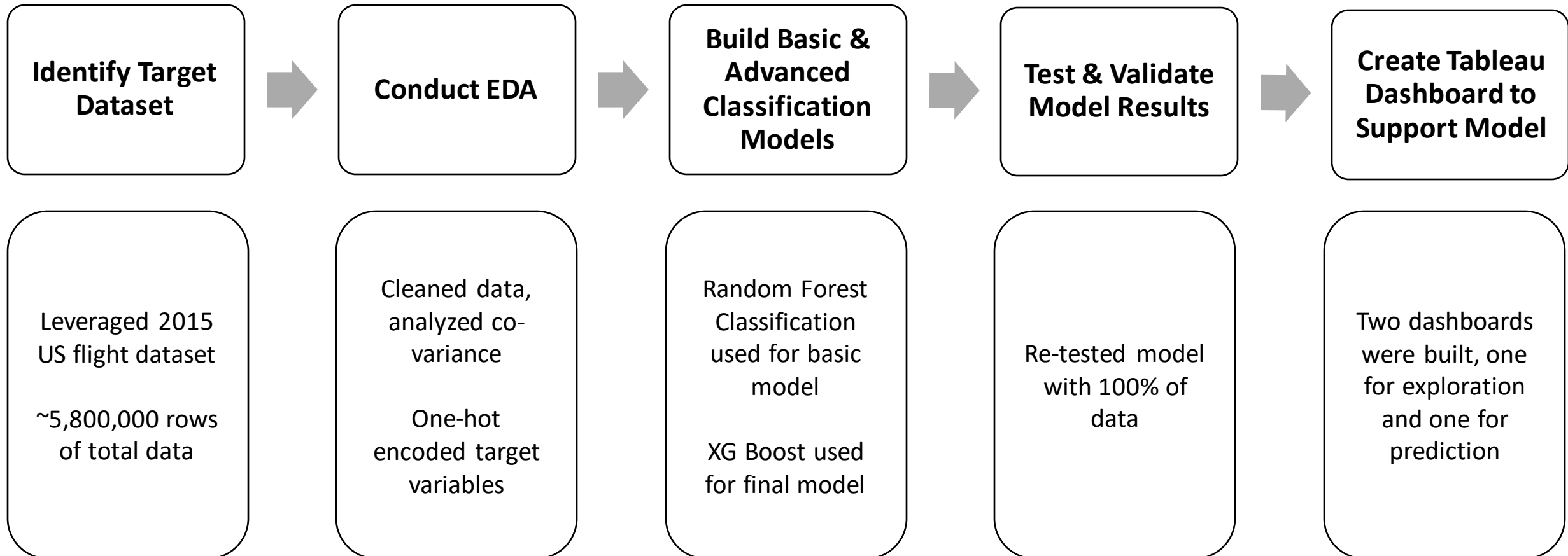
**Flight Delay Time
Prediction
Dashboard**

Project Goal & Approach

Project Goal

Build a classification model that can accurately predict flight delays

Approach



Project Roadblocks & Solutions

	01.	02.	03.	04.
Project Phase	EDA	Model Building	Model Building	Test & Validate
Roadblock	Redundant variables resulted in collinearity	Dataset too large for model building	One-hot encoding exponentially expands dataset	Prediction accuracy below expectations
Solution	Analyze co-linearity and drop redundant variables to simplify analysis	Take 10% random sample for exploratory model building	Pandas "Get Dummies" command successfully worked	Hyperparameter tuning <ul style="list-style-type: none">• Learning Rate• Max Tree Depth• Estimator Number

Flight Prediction Model Results

1 Accuracy: 0.65

Classification Report:

	precision	recall	f1-score	support
0	0.66	0.95	0.78	746293
1	0.55	0.11	0.18	417523
accuracy			0.65	1163816
macro avg	0.60	0.53	0.48	1163816
weighted avg	0.62	0.65	0.56	1163816

2

Feature Importance:

	Feature	Importance
0	SCHEDULED_DEPARTURE	0.357510
3	MONTH	0.293418
2	DAY_OF_WEEK	0.240834
1	DISTANCE	0.108238

3

1

Model Accuracy:

Overall model accuracy is 65%

Prediction Recall:

2

Model was more successful at predicting on-time (Bool = 0) versus delayed (Bool = 1) flights

Main Features:

Following features were highlighted:

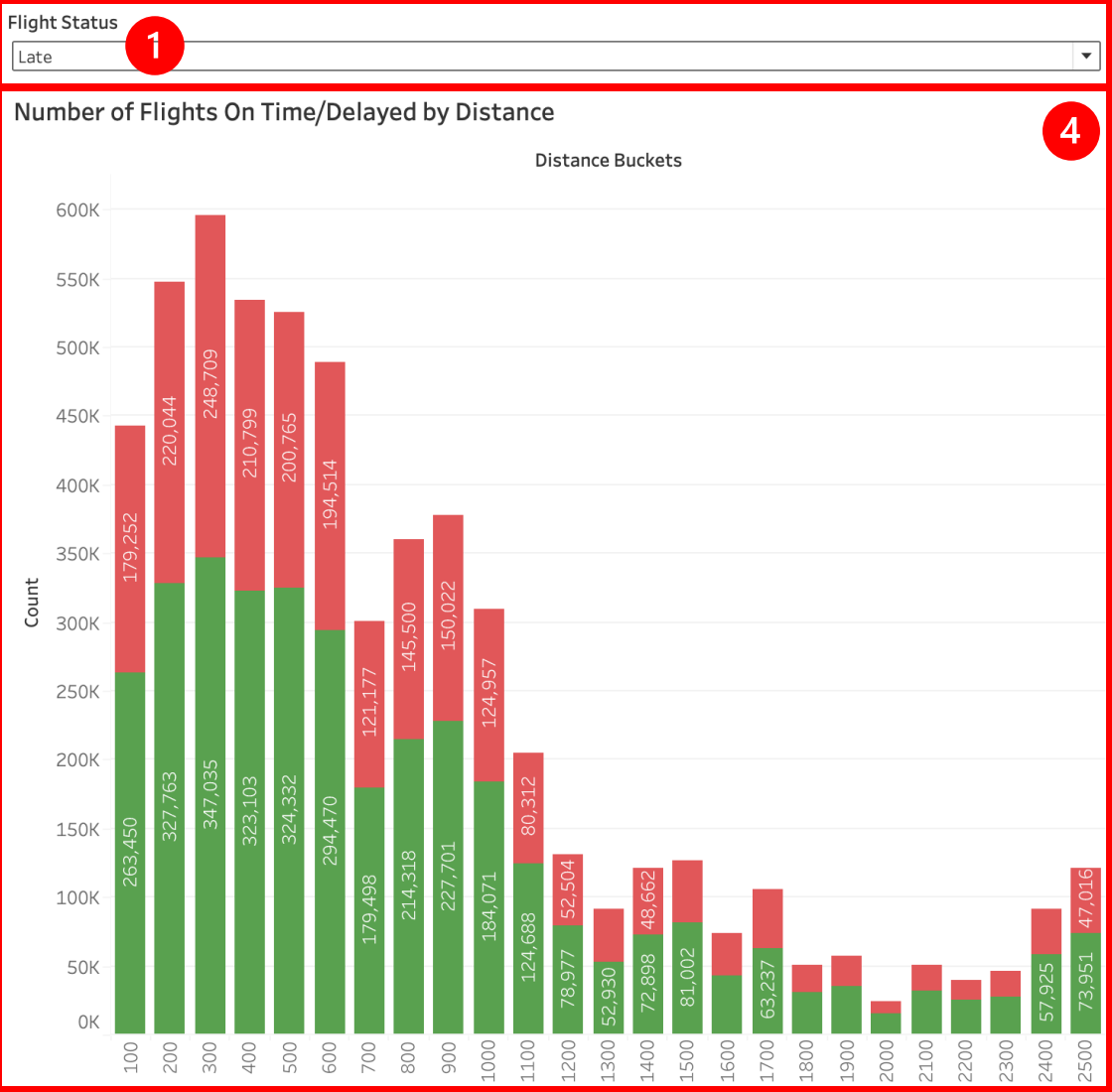
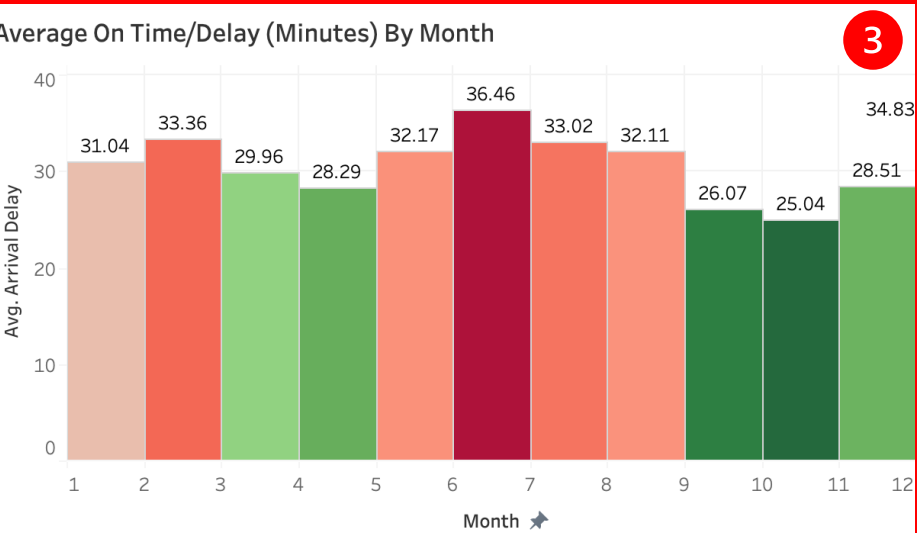
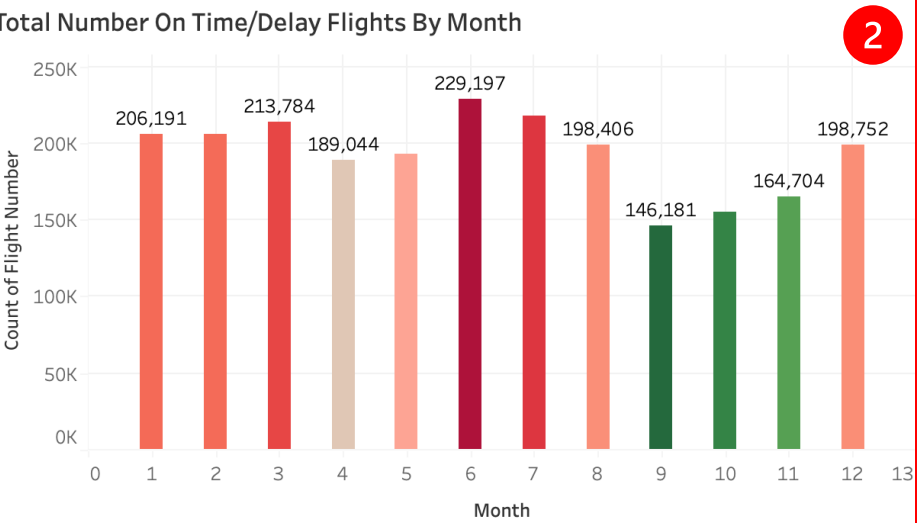
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- Departure time
- Month
- Day of week
- Flight distance

Feature Exploration Dashboard

Dashboard aims to explore core prediction features based on "On Time/Delay" Status

Flight Delay Feature Exploration Dashboard

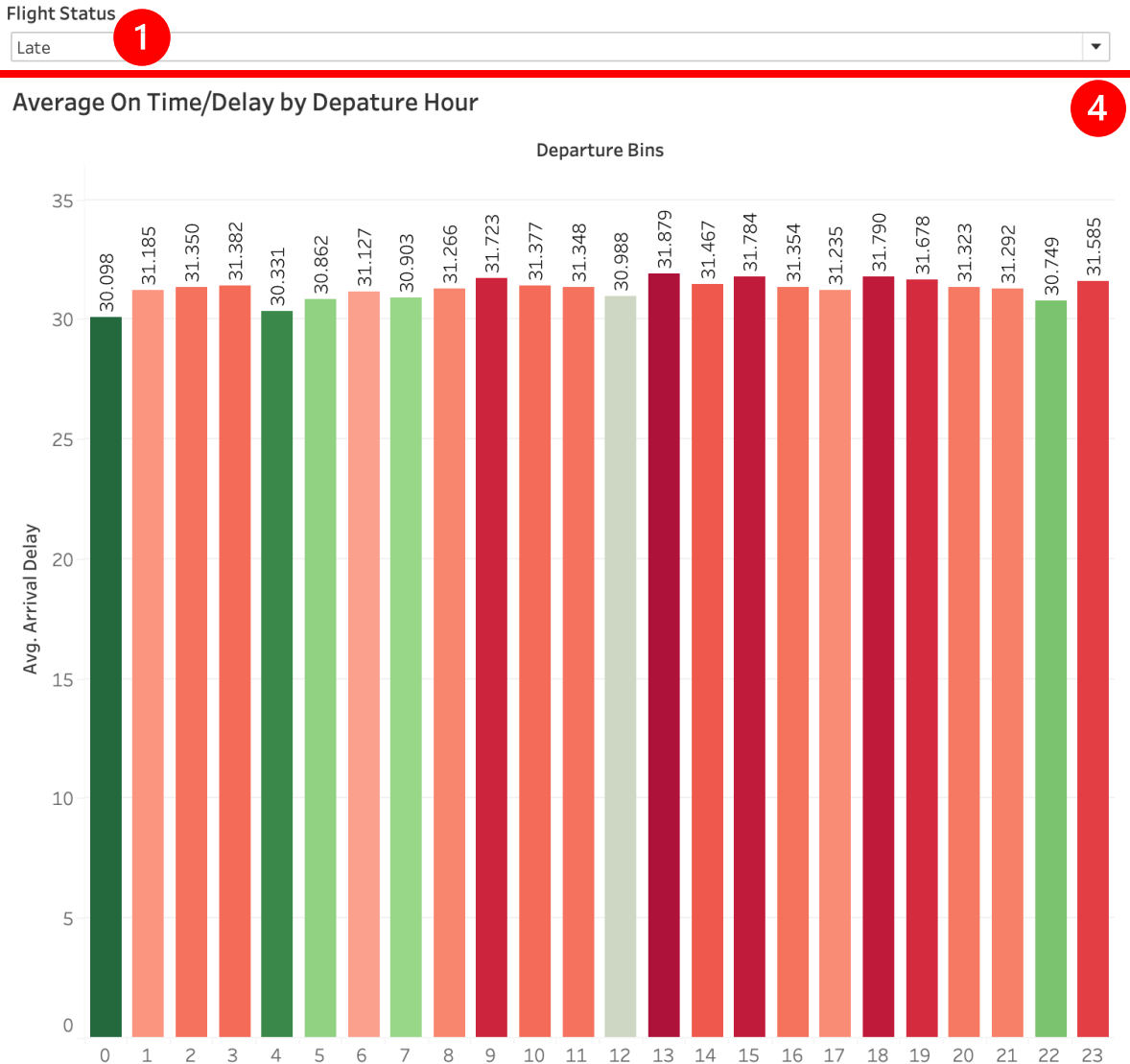
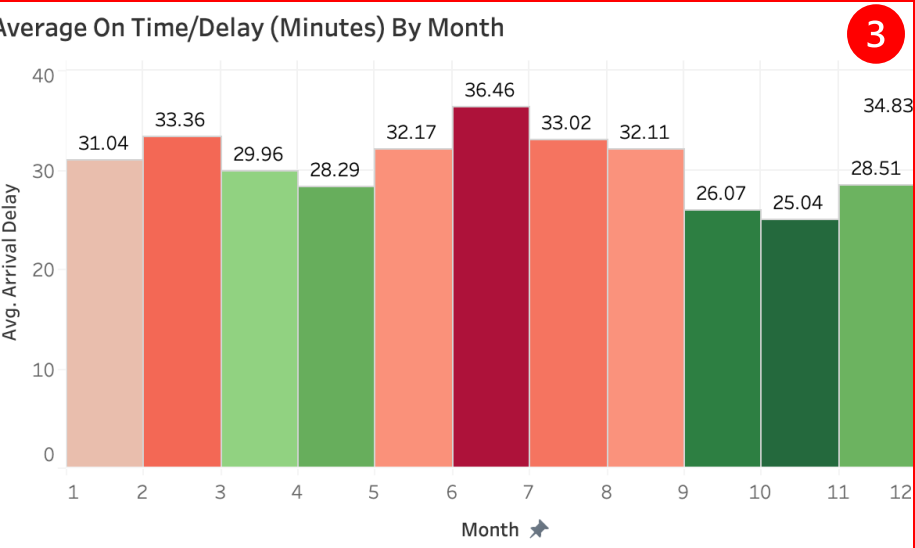
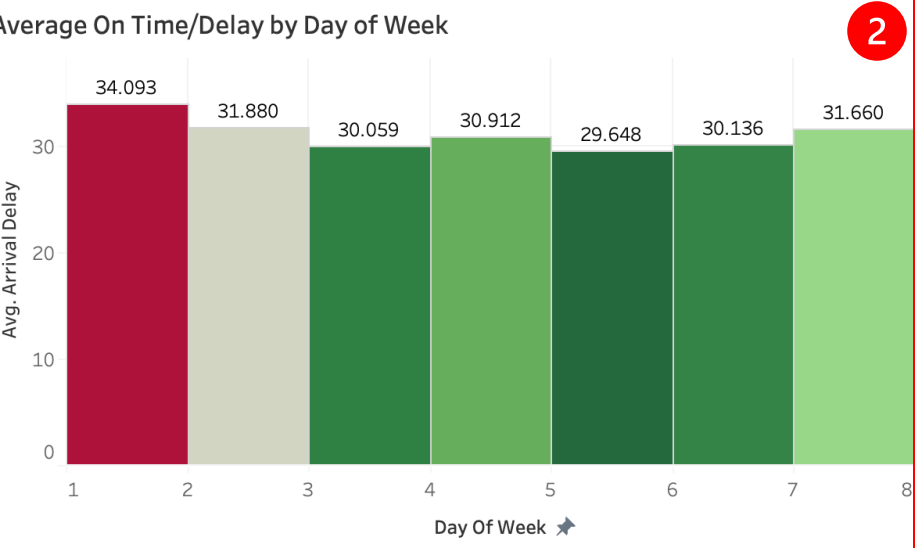


- 1 On Time/Delay Toggle
- 2 Total Flight Count Based on Classification
- 3 Average Delay by Calendar Month Exploration
- 4 Predicting Flight Delay Based on Distance (miles)

Flight Delay Time Prediction Dashboard

Dashboard predicts average flight performance across core feature metrics based on “On Time/Delay” selection

Flight Delay Time Prediction Dashboard



- 1 On Time/Delay Toggle
- 2 Average Arrival Time Based on **Day of Week** Departure
- 3 Average Arrival Time Based on **Month** Departure
- 4 Average Arrival Time Based on **Hour of Day** Departure