

Machine Learning Applications: Google Flights Results

A photograph of an airplane's wing and tail section against a backdrop of a sunset or sunrise. The sky is filled with warm, pinkish-orange hues. The wing is angled downwards from the left, and the tail is visible in the upper right. The overall mood is serene and travel-oriented.

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The airline industry is booming



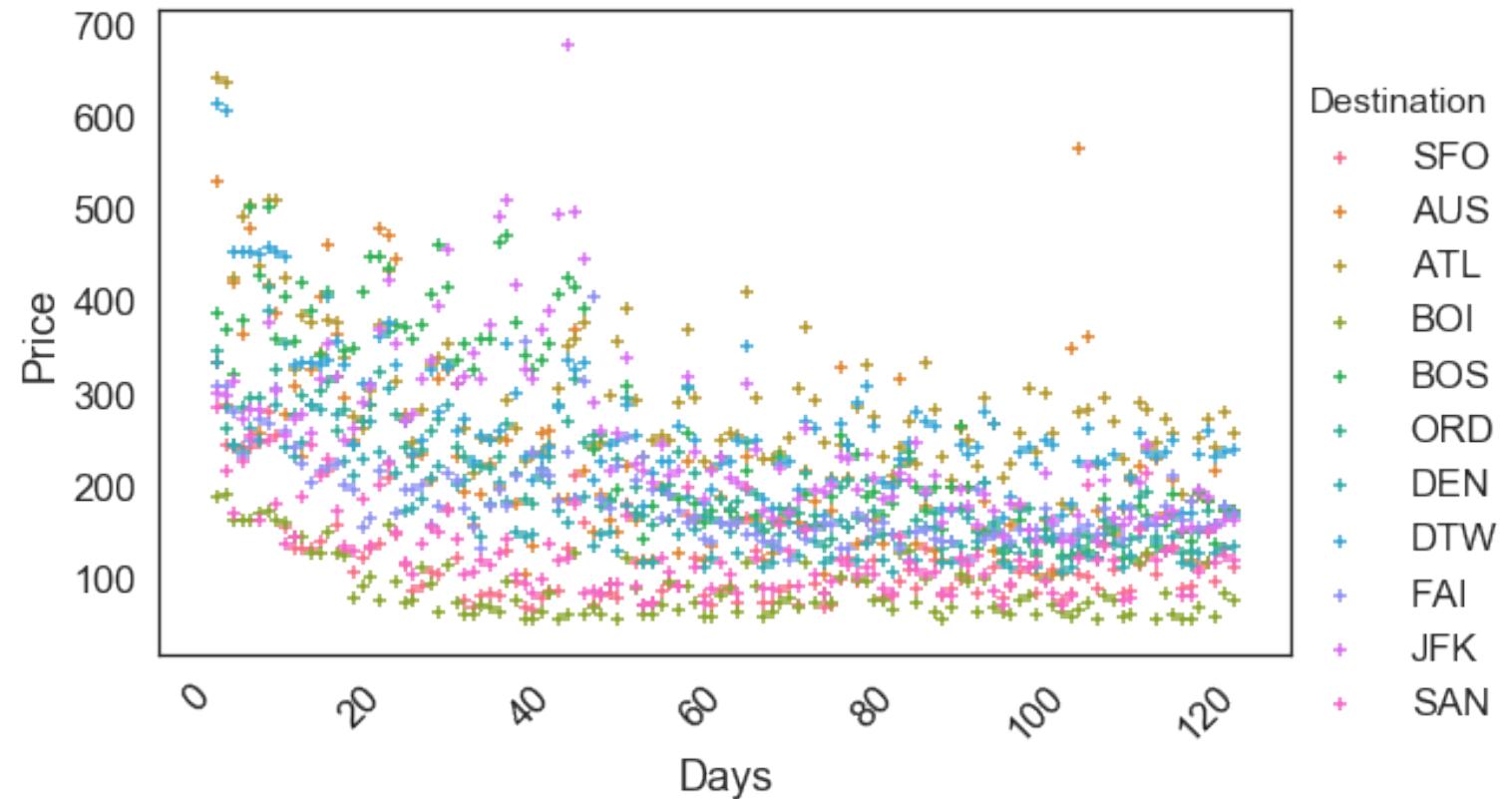
- US Bureau of Transportation:
 - Q1 2019 Net Profit (Domestic): \$2.1 Billion
 - 8.4 Million Domestic and 1.6 Million International flights in 2018
 - 2.36 Million passengers already in top 5 traffic airports in 2019
 - Average cost of flight \$344



Can Machine Learning
help businesses and
consumers save money
on flights?

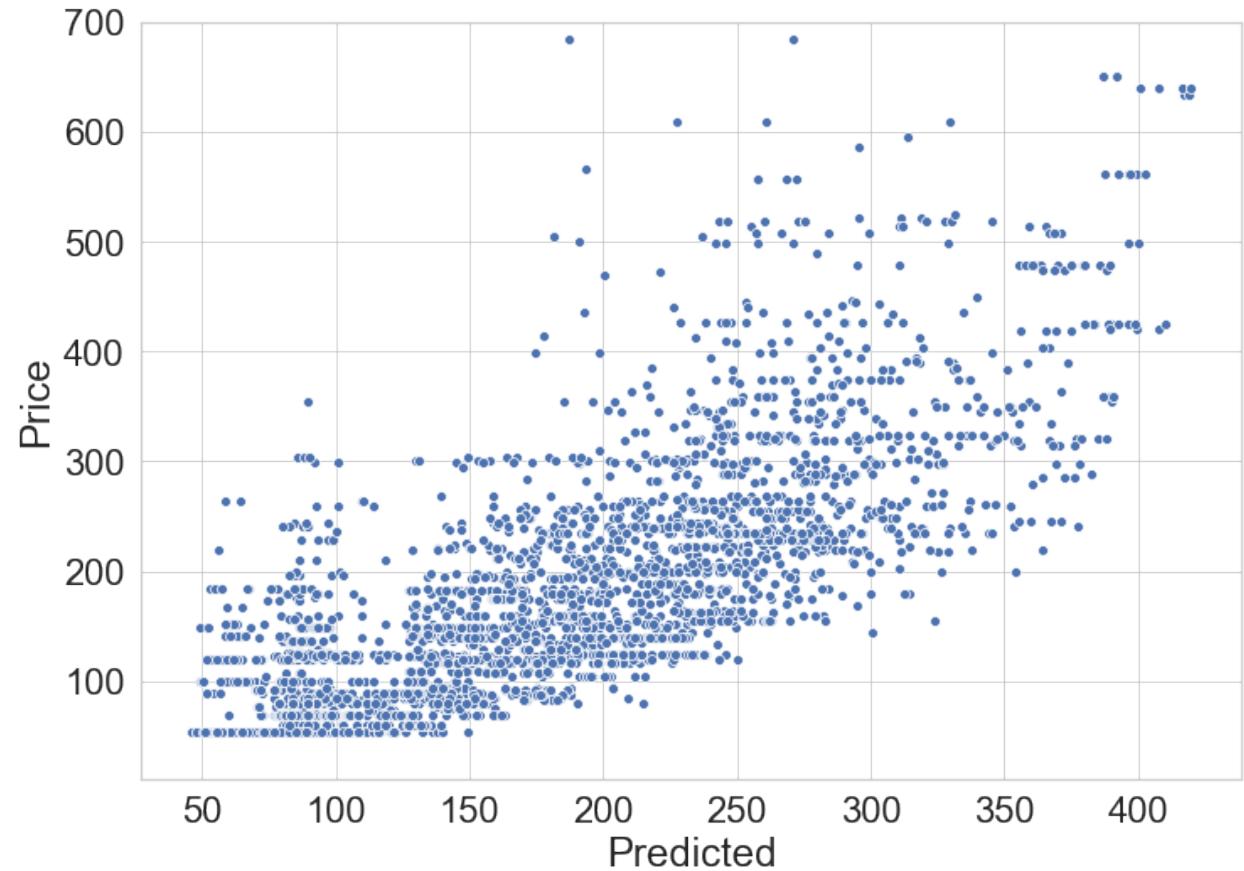
Automated data collection enables exploration of flight trends

- 120 days starting 7/22/2019
- 15,878 Flights
 - 1-way
 - Domestic
 - Non-stop
 - Includes carry-ons

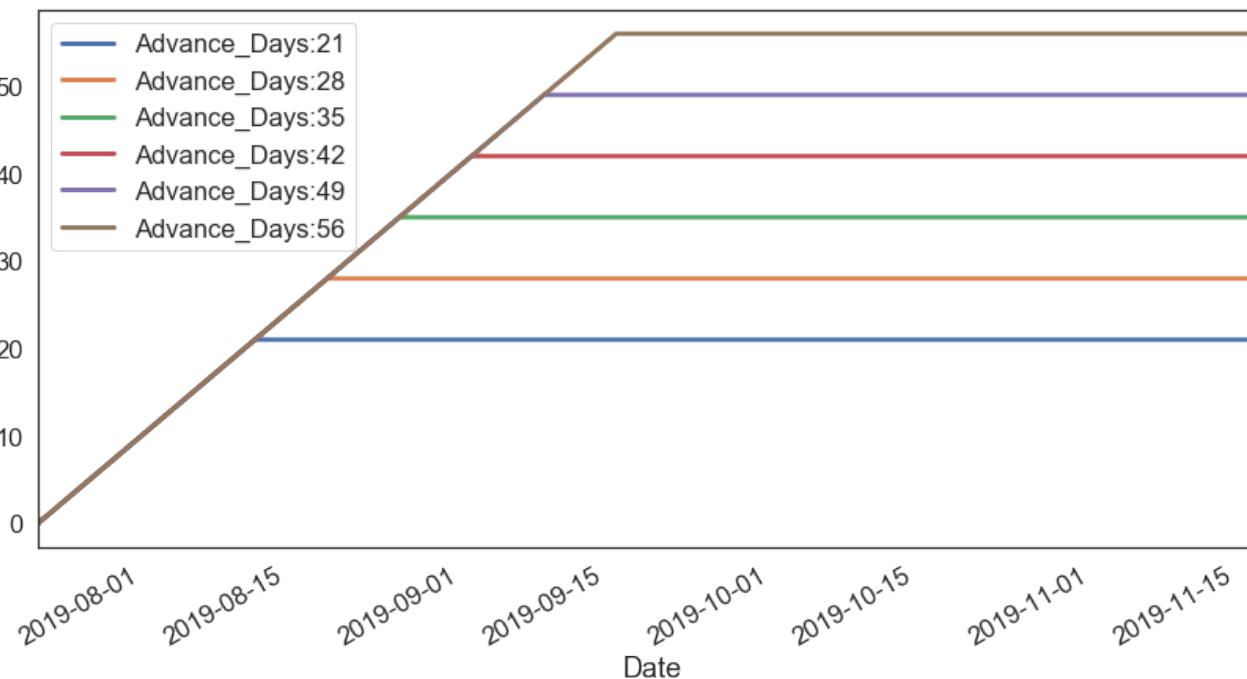


Linear regression yields predictions of prices

- Impactful factors:
 - Route
 - Time of year
 - Time in advance
- Linear regression returns an average error of $\sim \$50$



Feature engineering for predicting price plateaus



- Introduction of step function parameters
- A tradeoff between overall prediction quality and ability to extract general insight from ML model
- Lasso fit constrains model to pick one of these features

A travel-themed still life arrangement is set against a background of an antique world map. The items include a vintage Minolta 6DX SLR camera with a Helios 44M-4 lens, a Polaroid photo of Big Ben, a magnifying glass resting on a spool of twine, a notebook with the text 'Book 5 Weeks in Advance', a pencil, and a pair of dark-rimmed glasses.

Book
5 Weeks
in Advance