What's My Flight Status?

Using Flight Data to Predict Flight Delays

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Overview:

Objectives:

➔ Using machine learning and deep learning algorithms to build a model that will predict flight delays.

Process:

➔ Employ sampling techniques and advanced classification algorithms to enhance precision.

Results:

➔ The deep learning model serves as the best algorithm for predicting flight delays, yielding 30.3% precision.

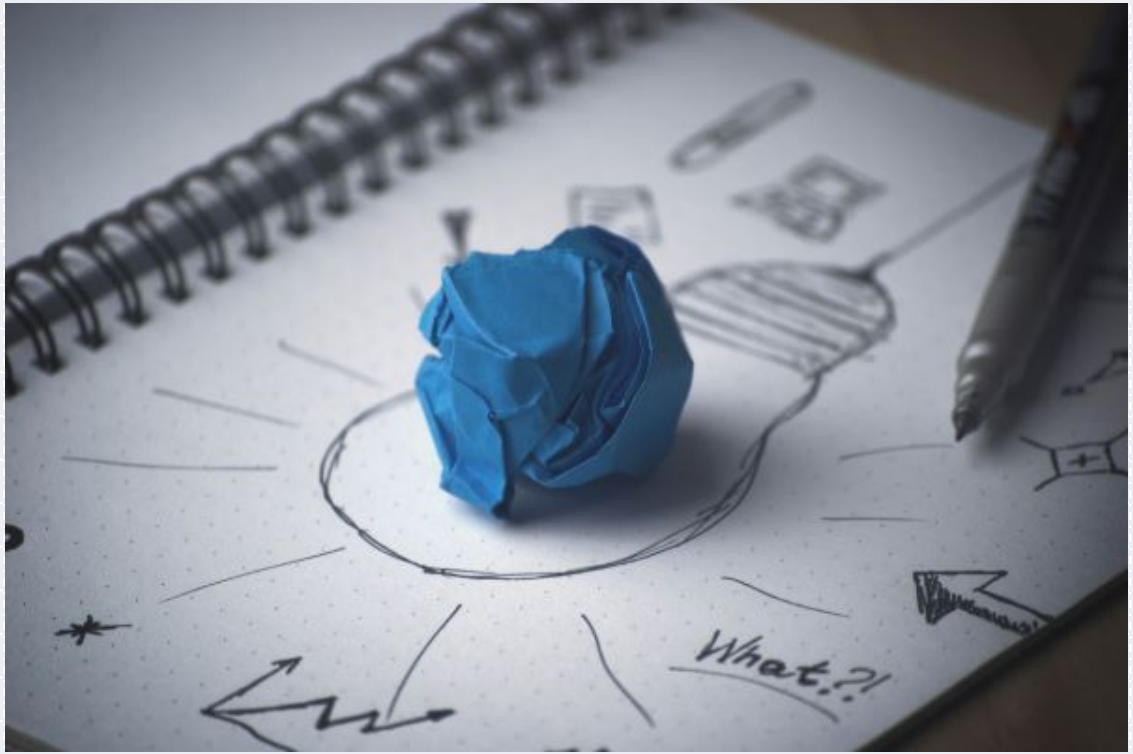
Outline:

01 Business Problem

02 Data & Methods

03 Modeling

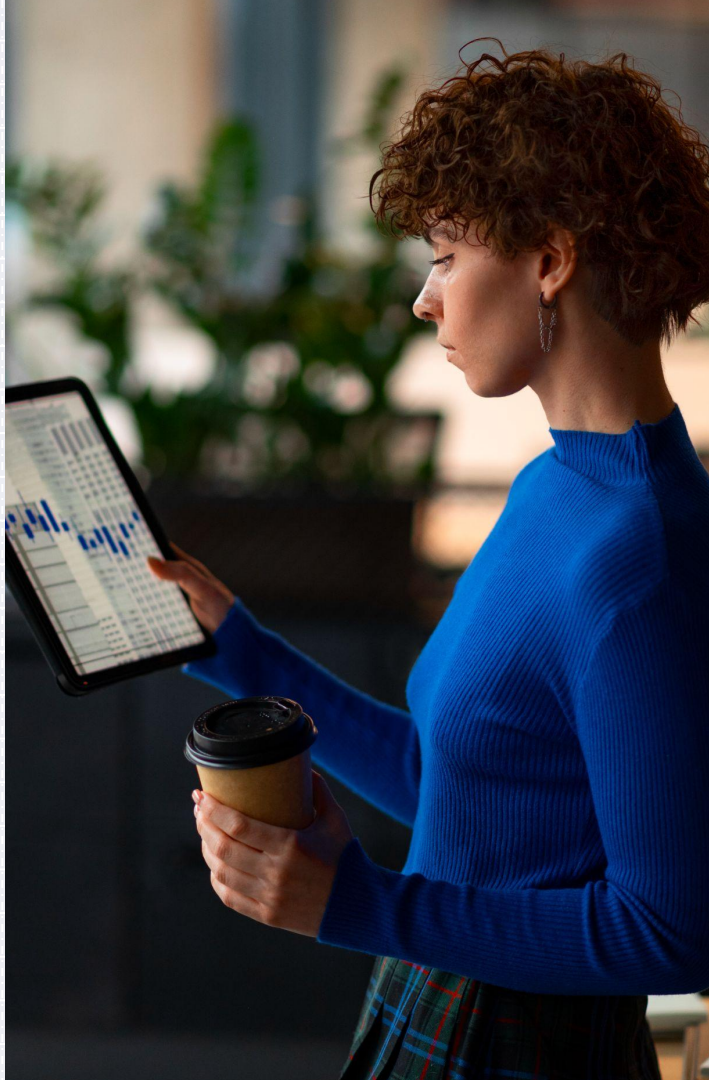
04 Conclusions



Business Problem:

United Airlines is looking to regain consumer confidence by addressing their flight delays.

➔ Use both machine learning and deep learning to build a model that will predict flight delays with the highest precision.



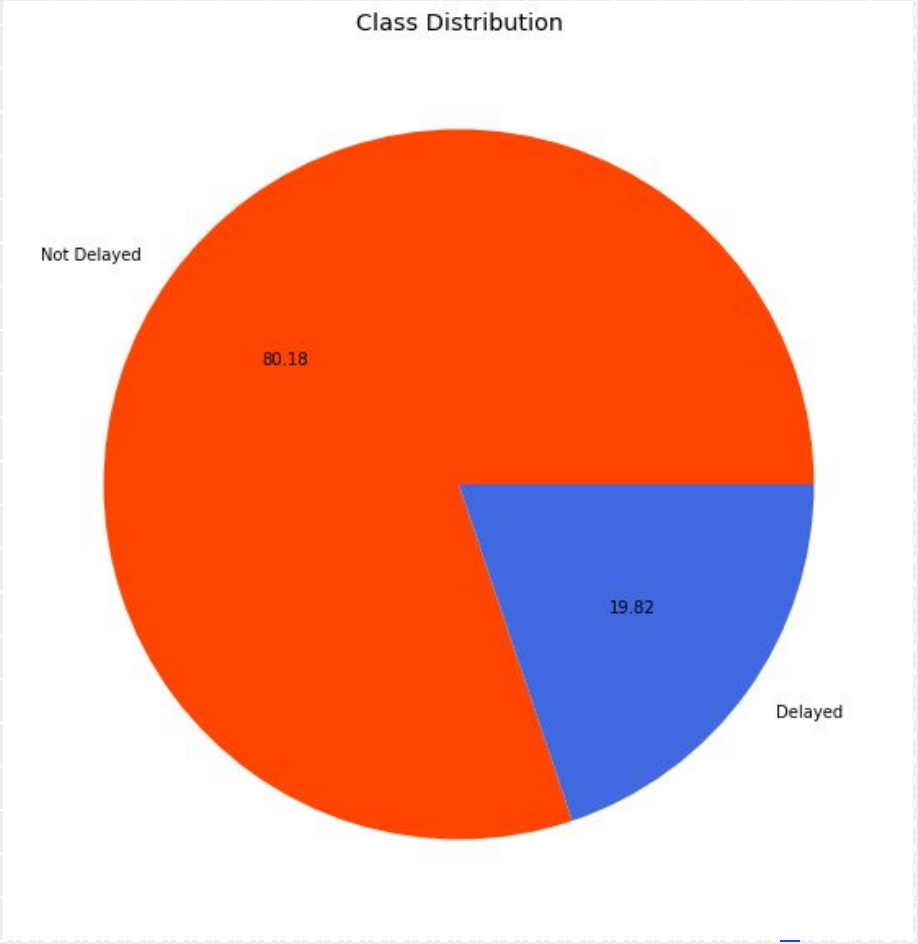
Data & Methods:

The Data:

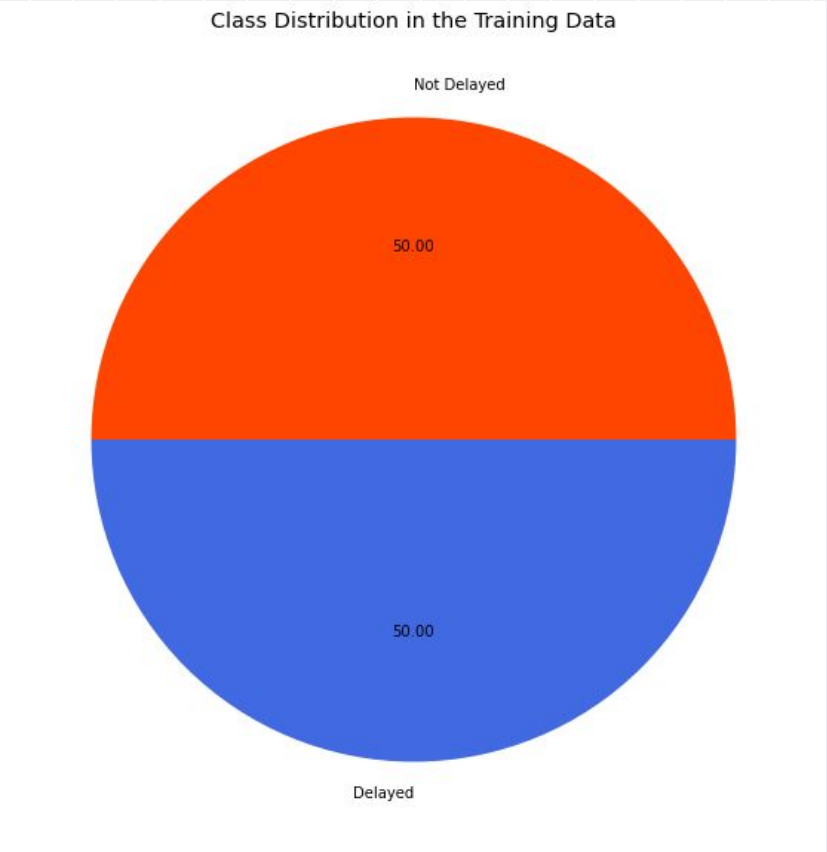
- Contains airline, weather, and airport information from 2019
- **582,939** United flights analyzed

Class Distribution:

- **80. 18%** of United flights were on-time
- **19.82%** of United flights were delayed



Data & Methods (cont.):



Methods:

- Before modeling, I balance the data's target distribution.

Modeling:

Evaluation:

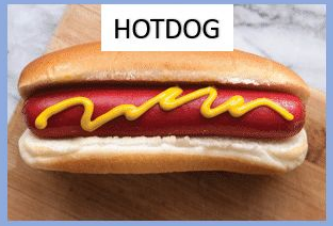
➔ Models were evaluated on precision and the number of false positive predictions.

True negative

False positive

False negative

True positive



Modeling Results:

- The deep learning algorithm (final model) is 30.3% precise.
- Out of 72,867 predictions, the model had 19,183 false positive cases.

Conclusions:

1. The deep learning algorithms performed better than the machine learning algorithms.

2. The model is 30.3% precise when testing and classifying flights as delayed or not delayed.

Limitations & Further Work:

- ➔ Computational constraints
- ➔ Imbalanced classes in data
- ➔ Deeper neural network model
- ➔ More post-pandemic data

Thank You!

Do you have any questions? Contact me!

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