# Fraud Detection

# Medicare Claims

Exploring ALTERYX

Anisha Joshi, IDS 506, 29th March 2022

# Detailed Overview

Fraud Detection using Medicare Claims dataset

- CMS dataset(M): Medicare Provider Utilization & Payment Data
- LEIE Dataset(L) - List of fraudulent providers
- Goal - With the two datasets - identify the patterns in fraudulent claims and develop a classifier model.

01 → 02 → 03

## Ingestion

Load all the data
Filter only the valid NPI data from L
Take Union of all the M datasets
Inner Join with NPI: Left join on L and Right join on M
Define Fraud Label with Y/N
Keep only non-null unique values & save as csv

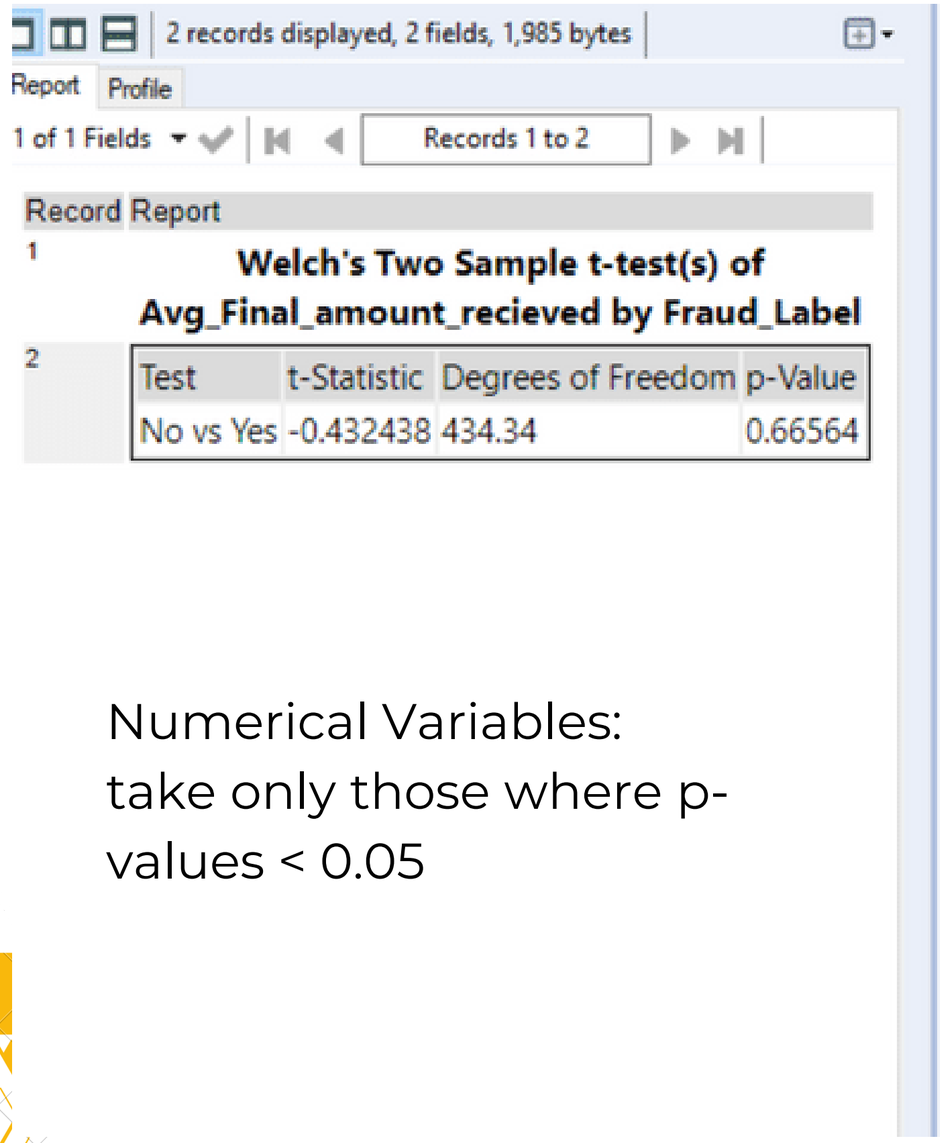
## Curation

Use the ingested data
Only Unique NPIs & HCPCS code
Convert to respective datatypes
Define & add some custom metrics
Summarize the values with group by, count & average
Save the output data as csv file

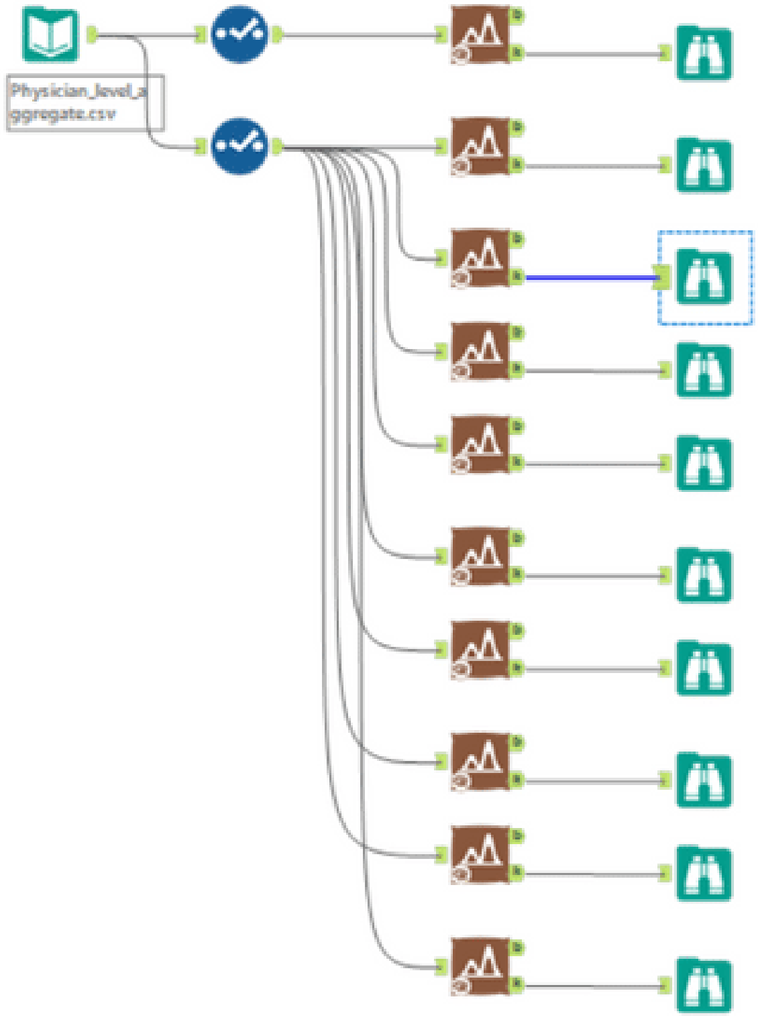
## ML Model

Performed t-test (Num var.)
Contingency Table (Cat var.)
Tried Logistic Regression & Boosted Model

# Statistics Data Report

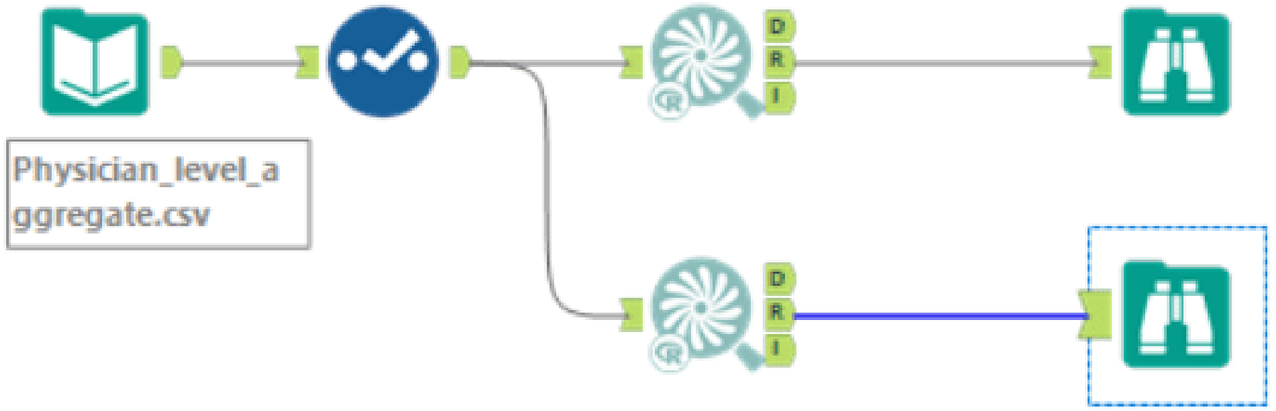



Numerical Variables:
take only those where p-values < 0.05



# Select the Categorical Variables

Used contingency table
Refer to p values



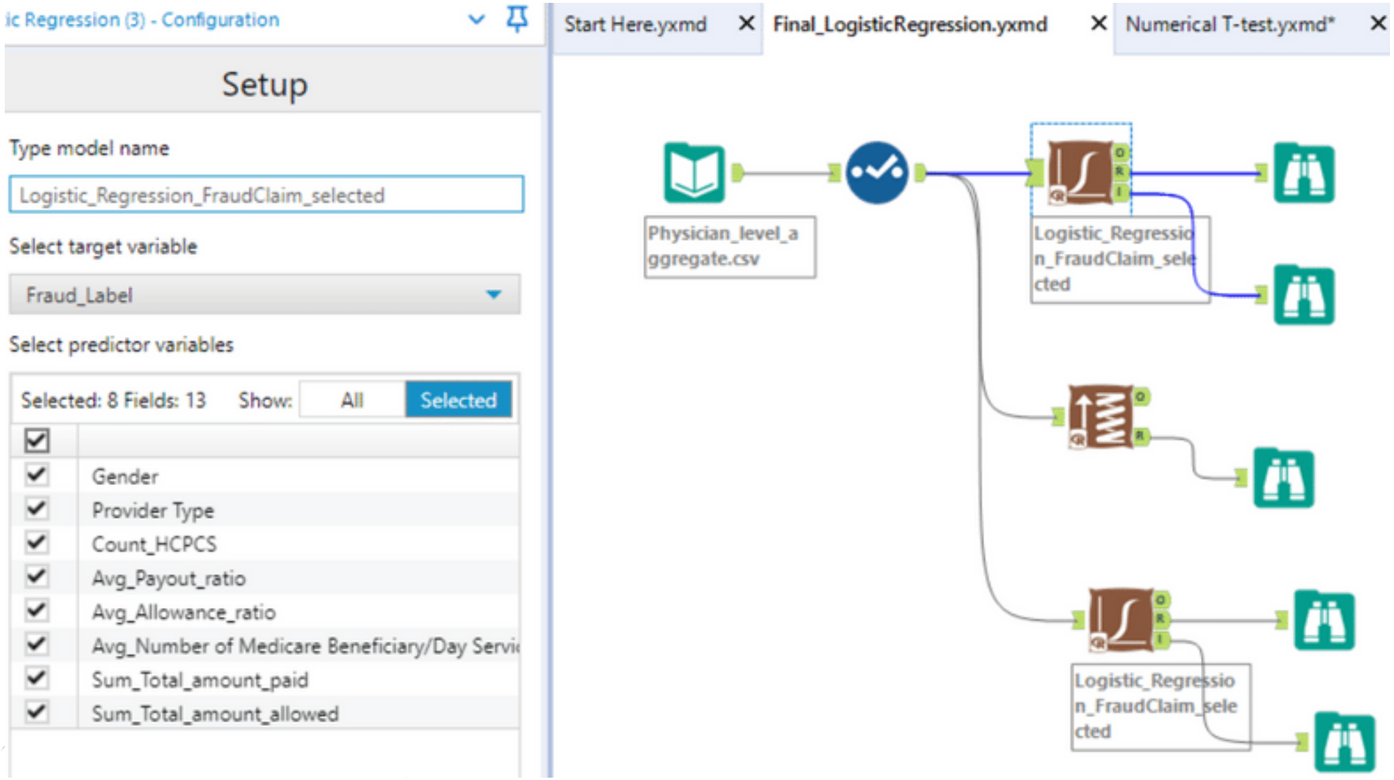

*Provider Type & Target Value(Fraud _Label)*

Chi-squared = 184.5167, df = 62, p-value < 0.0000

*Gender & Target Value(Fraud _Label)*

Chi-squared = 101.1603, df = 2, p-value < 0.0000

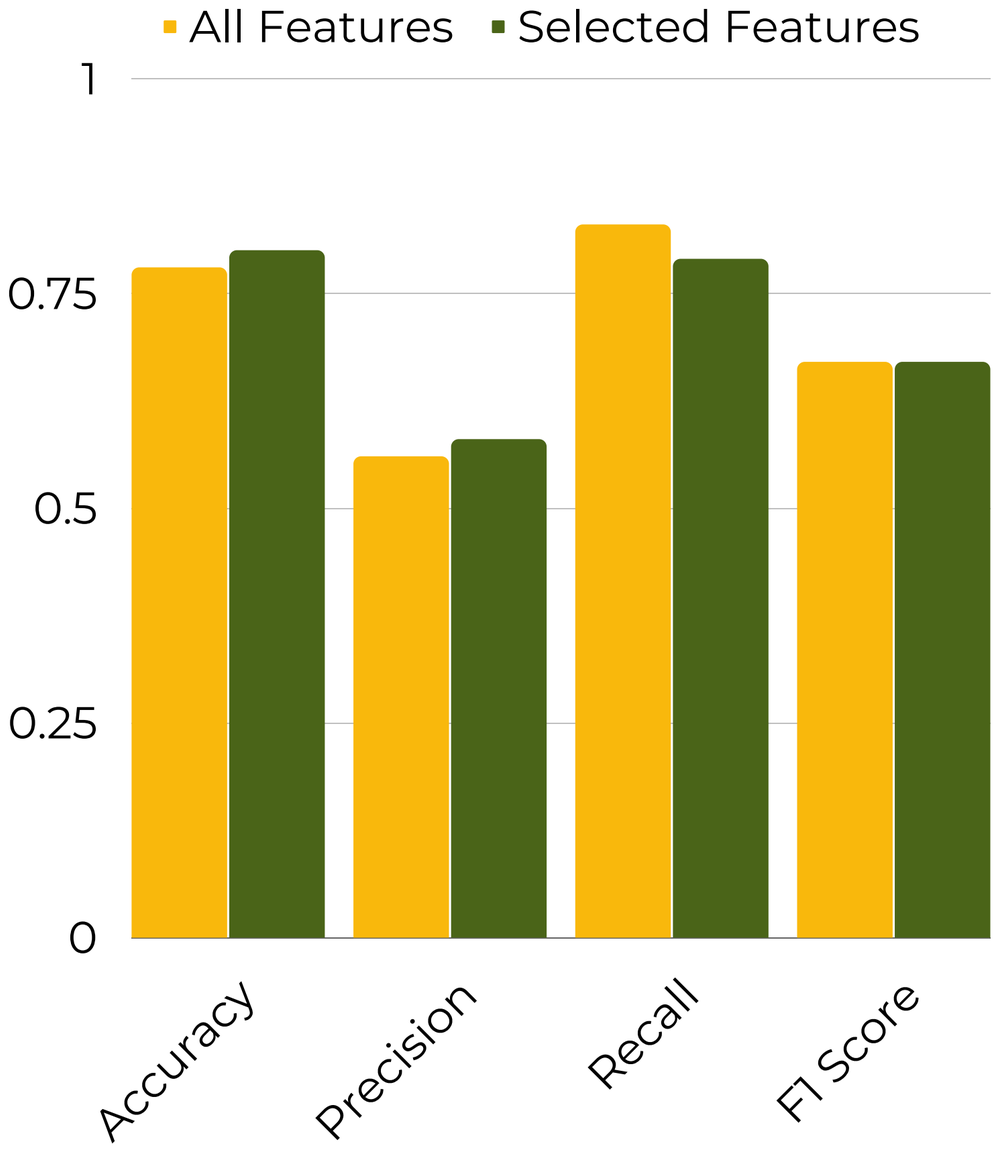
# Compare the Classifier





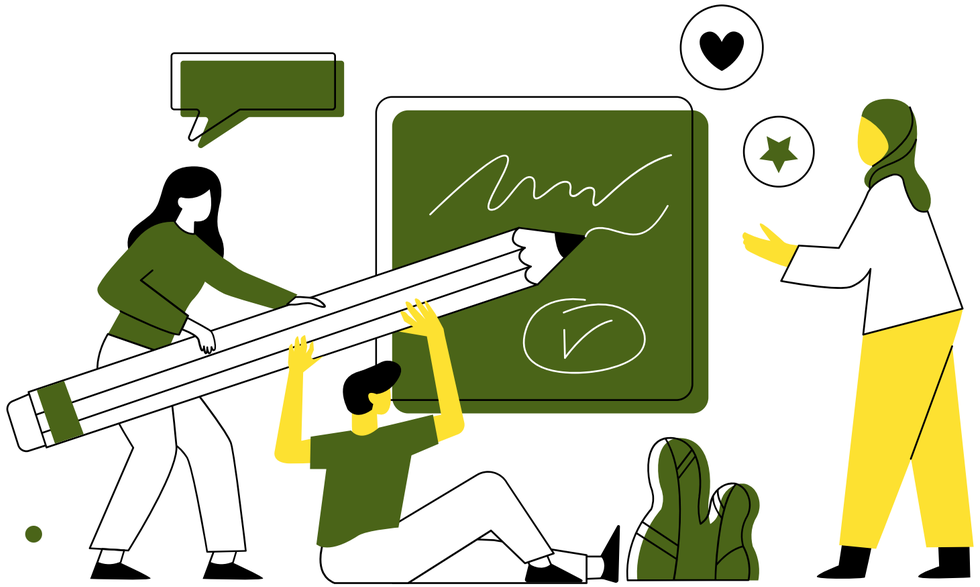


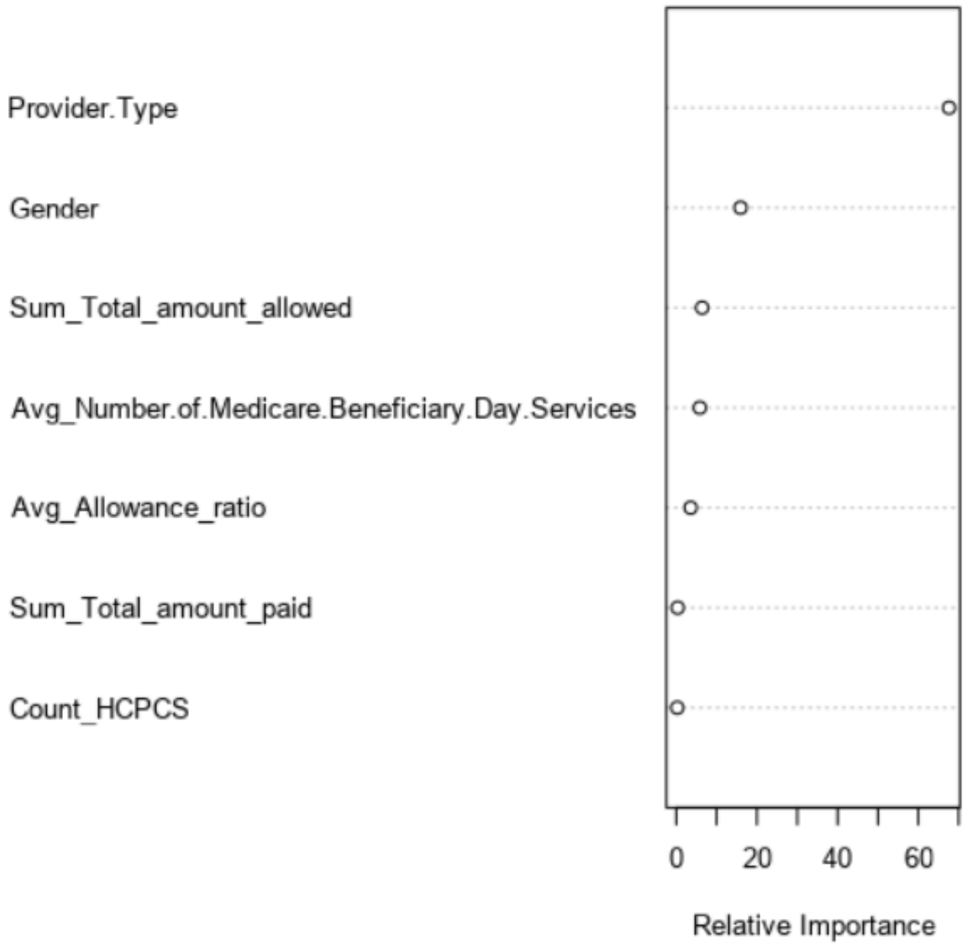
FP is more important - Precision



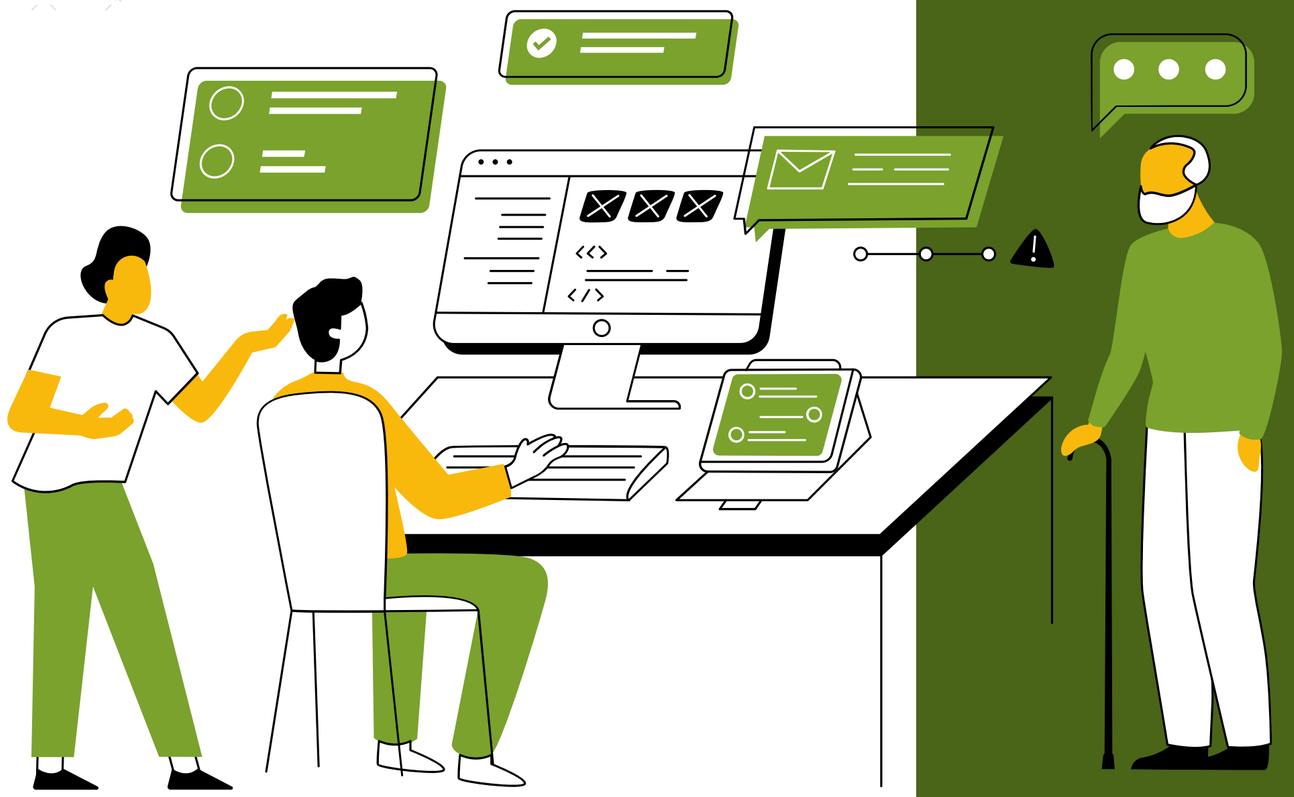
# Feature Importance

From Boosted Model
(Same Table & Features as previous)






Variable Importance Plot provides information about the relative importance



# Further Steps

Lasso/Ridge regression
Have the Model with only Imp Features