Personal Project

ANOMALY DETECTION OF CONGRESS TRADES

Apr 4, 2024

0.

Problem Area and Opportunity

Insider Trading

- US Congress members create policies and can leverage non–public information for financial gain,

- The STOCK act requires them to report their transactions

Opportunity

- There is a need to identify deviations that could suggest insider trading activities and stock manipulation

Parties Impacted:

Retail Investors

Regulatory Bodies

Financial Analysts/ investors

Preprocessing and EDA

1

Merging Data

Matching S&P data with the transaction dates of congress data

2

Scaling and one hot encoding

Scaling to prevent domination by outliers
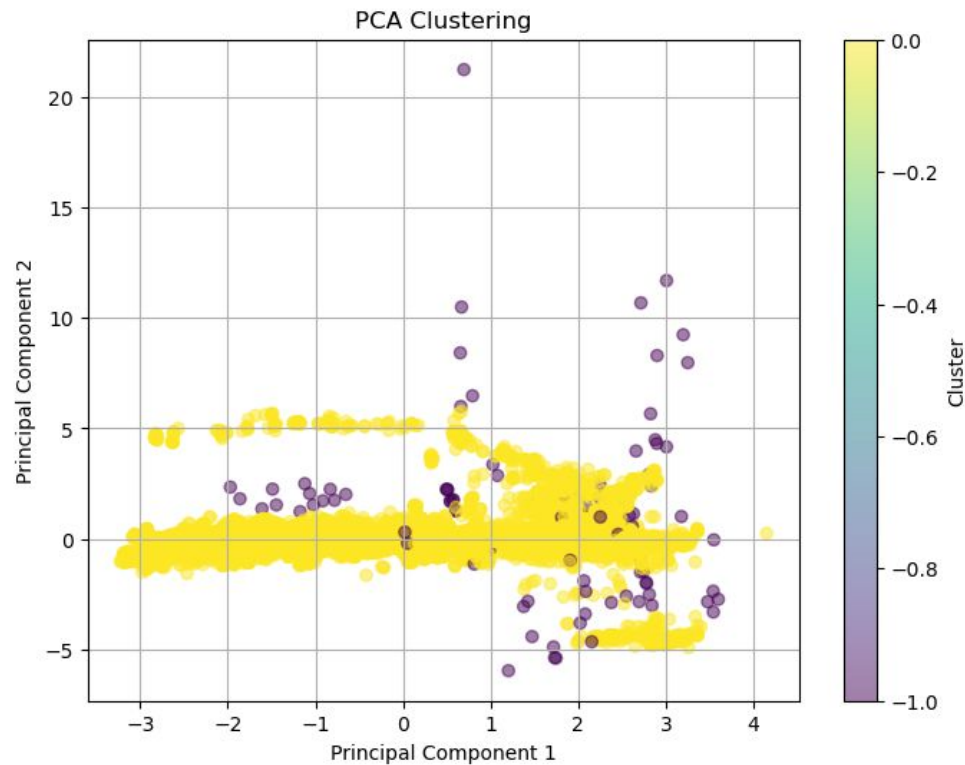
Turning categorical data to numerical

3

Time Series analyses

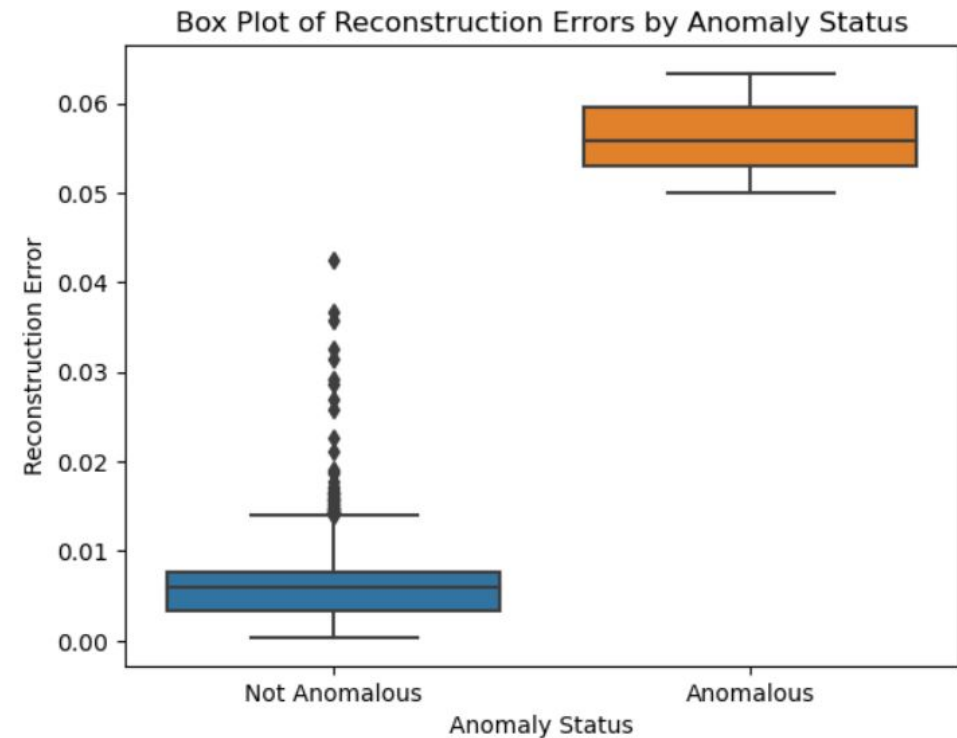Plotting market performance data (volume and closing price – adjusted)

2.

Anomaly Detection using Unsupervised ML Algos:

1. Hierarchical Clustering
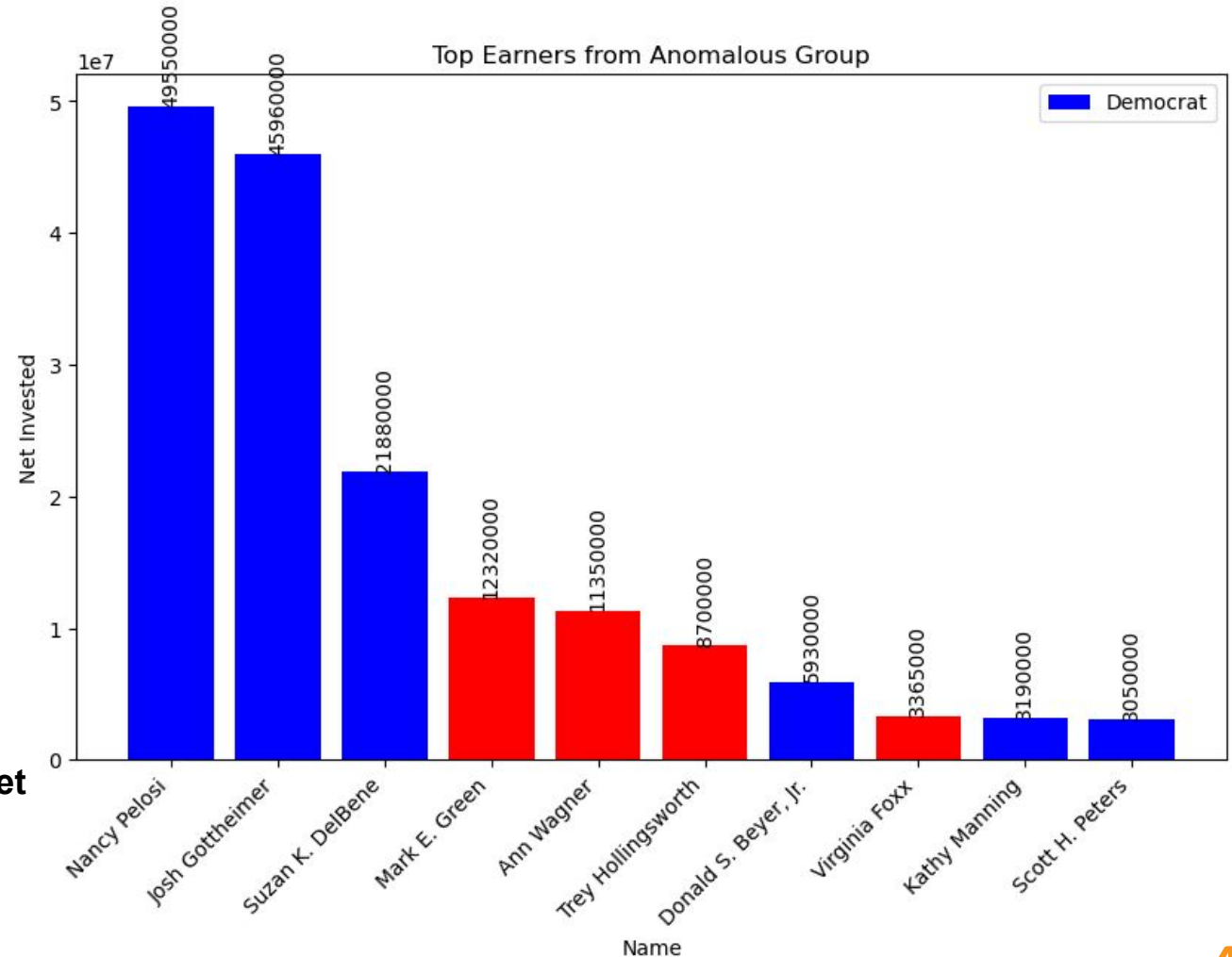
2. Autoencoders

3.

Modeling Insights

Insights Include

- net means of anomaly vs non anomaly group
  - **Anomalous** - $3,643,122
  - **Not anomalous** - $286,789

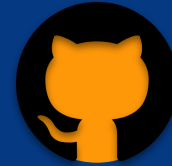- **49** congress members were detected as anomalous,
- **148** non anomalous

The graph on the right shows:

- Top 3 investors are **democrats**
  - a **net amount of 20-40 million still in the market** within 3 years
- Consider their job salary is **~150k/year**

4.

Thank you!

Github:
https://github.com/tiffchu

Website:
https://sites.google.com/view/tiff-anomaly-detection/home?authuser=0

Congress Trades Dataset:
https://senatestockwatcher.com/api

5.