Employee Attrition

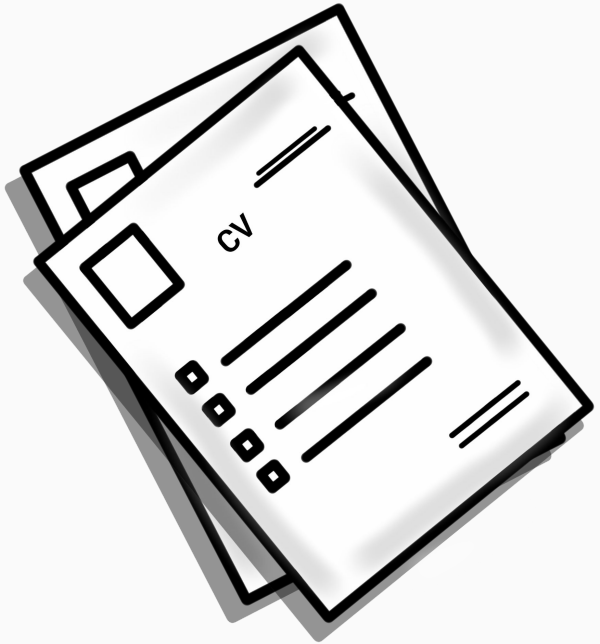
Natural Chan

Background

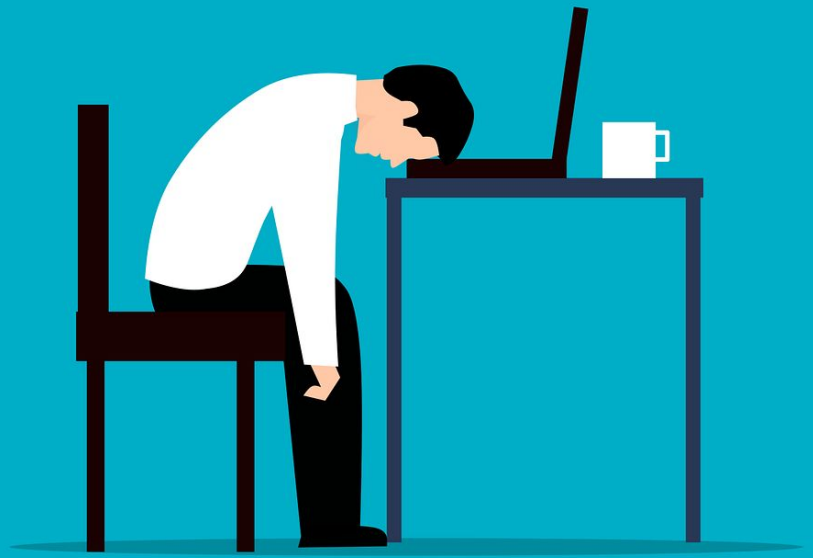
- “The Great Resignation”
- Worker apathy & Anti-Work Mentality

- **Who is likely to leave their job?**

- **Identify strong indicators**
- **Classify based on demographics & employment information**



Data



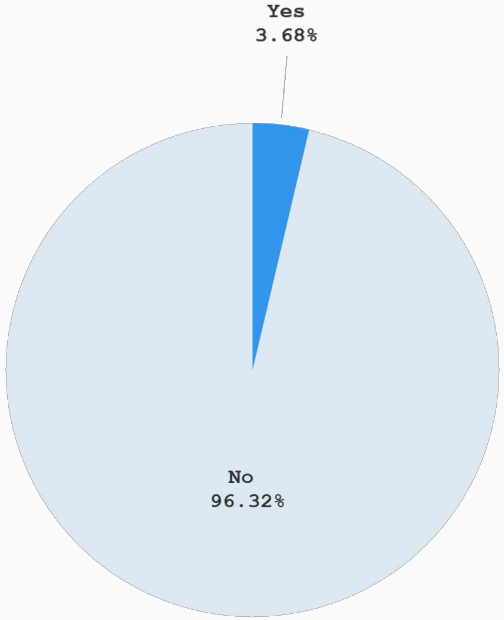
- U.S. Bureau of Labor Statistics
- National Longitudinal Surveys **(NLS97)**

- **Job Search Label**

Modeling

- **Class Imbalance**
- Oversample positive label
- **SMOTE** with **5-Fold CV**

- **Create pipelines** for each model
- F-2 Score



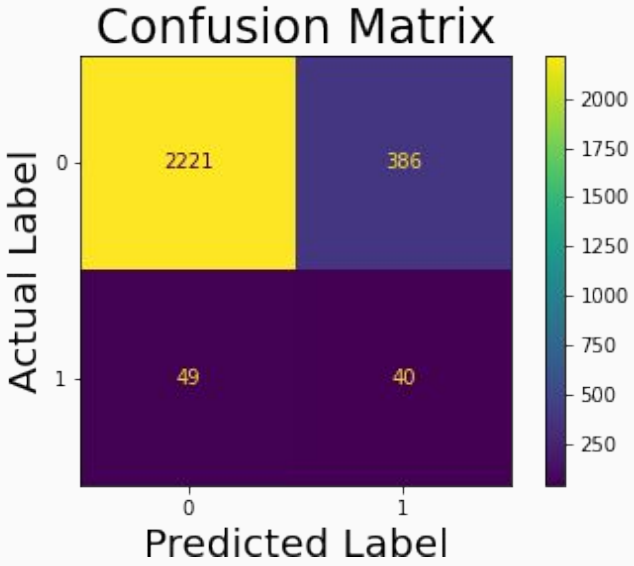
Base Model(s)

	Accuracy	Precision	Recall	F1	**F2**
Decision Tree	.9230	.1508	**.1995**	.1686	**.1848**
Random Forest	.9591	.2233	.0309	.0533	.0371
XGBoost	.9587	.3506	.0764	.1240	.0902

Hyperparameters

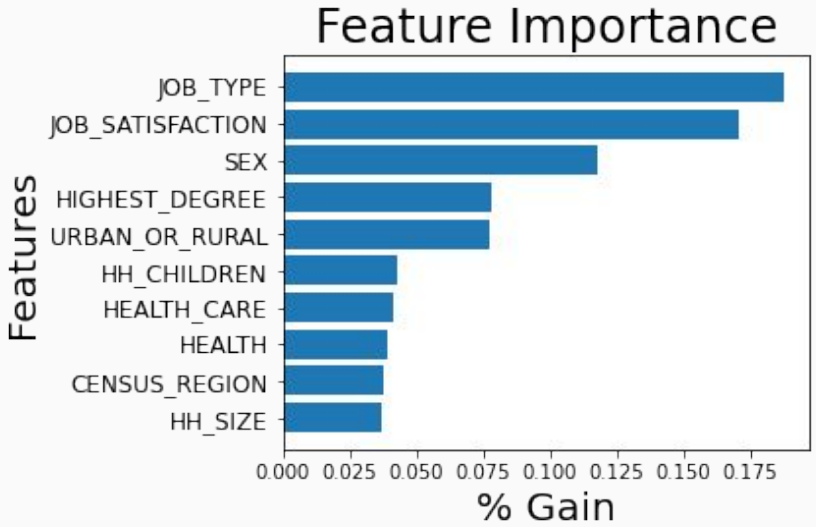
	Accuracy	Precision	Recall	F1	**F2**
Decision Tree	.8750	.1076	.3820	.1679	.2530
Random Forest	.7637	.0873	**.6517**	.1541	.2843
XGBoost	.8587	.1164	**.4944**	.1887	**.2997**

Results



- **XGBoost**
- Hyperparameters:
  - colsample_bylevel 0.9729
  - colsample_bynode 0.4627
  - colsample_bytree 0.8789
  - eta 0.0556
  - gamma 8.4169
  - max_delta_step 54
  - max_depth 5
  - min_child_weight 9

Results



- **Job Type** (Standard, Self-employed, non-traditional, military)
- **Job Satisfaction**
- **Household Information** is a weaker indicator

Conclusion/Future Work

- Identify **employee satisfaction** via surveys/feedback

- **Limitations of Data**
- Specify career fields
- Increase sample size by analyzing other years

Appendix

PUBID	JS_PROB	JOB_SEARCH
4111.0	0.842040	1
3800.0	0.829341	1
1515.0	0.827314	1
1504.0	0.822710	0
7944.0	0.818371	1
1408.0	0.808698	0
3418.0	0.796898	0
4709.0	0.796657	0
3856.0	0.793794	0
3006.0	0.791338	0

Top 10 Most Confident Predictions

Only 4/10 were actually searching for a job

Top 3 were true positive

All 3 responded: “Think it is OK” for job satisfaction at a Non-Traditional Job