EMPLOYEE ATTRITION ANALYSIS

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Introduction

Employee Attrition: when an employee leaves an organization for voluntary or involuntary reasons and is not replaced for a long time, or not ever.

- **17.3%** attrition count in 2023 in the United States
- **Compensation :** the key player
- **75%** of the reasons for employee attrition can be prevented
- The cost of losing an employee can range from tens of thousands of dollars to twice their annual salary

Problem Statement

- Organizations struggle with high employee attrition rates that incur substantial costs and undermine performance, highlighting the need for research to understand attrition drivers and develop effective retention strategies.

Identify the Predominant Causes of Employee Attrition

Research Objectives

Help businesses design tailored employee retention strategies

Methodology

Data Source & Description

- IBM Employee Attrition Dataset
- 1470 records with 35 features

Data Wrangling (Python)

- Checked for missing data
- Set the column type to the desired type
- Dropped irrelevant attributes

Data Pre-processing (Python)

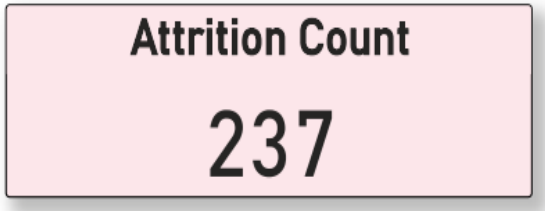
- Encoded variables in binary codes
- Checked for data inconsistency

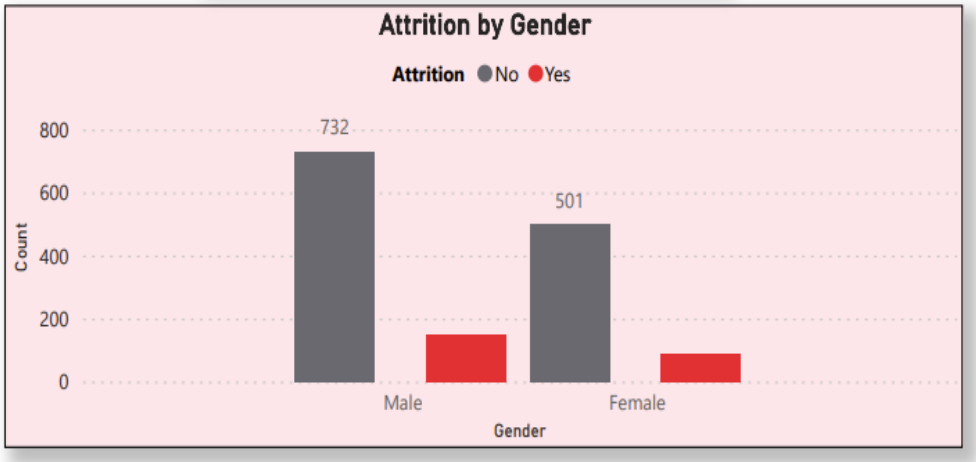
EDA and Inferential Analysis (Power BI)

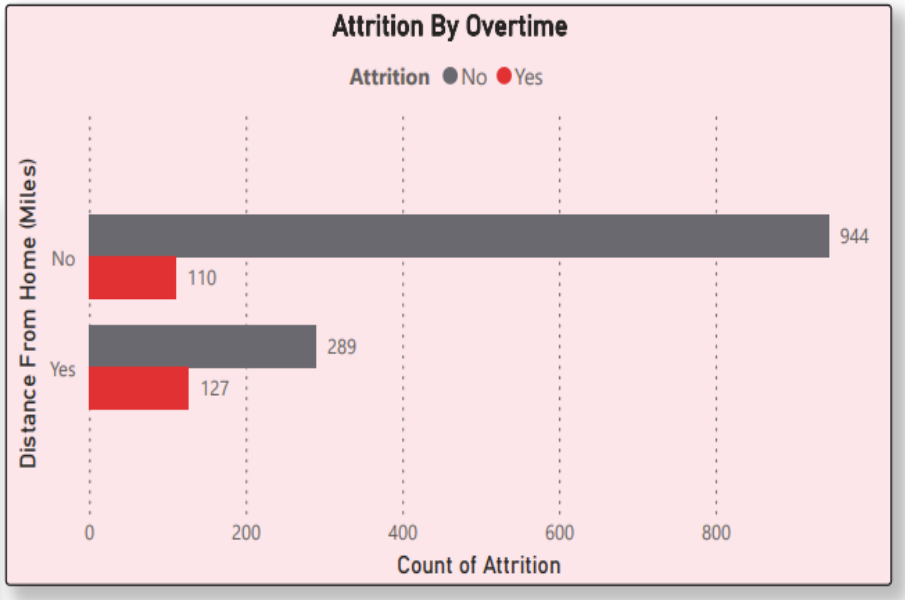
ML Models (Python)

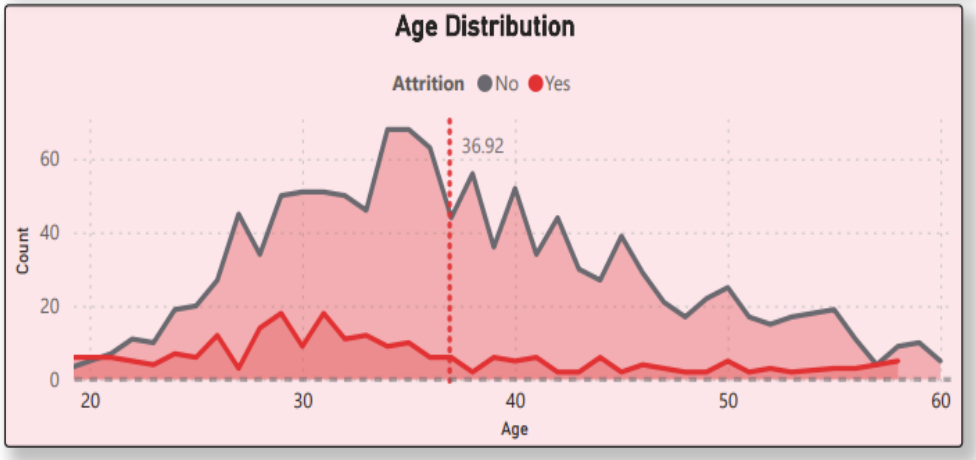
- Logistic Regression
- XGBoost
- KNN
- Decision Tree
- Random Forest

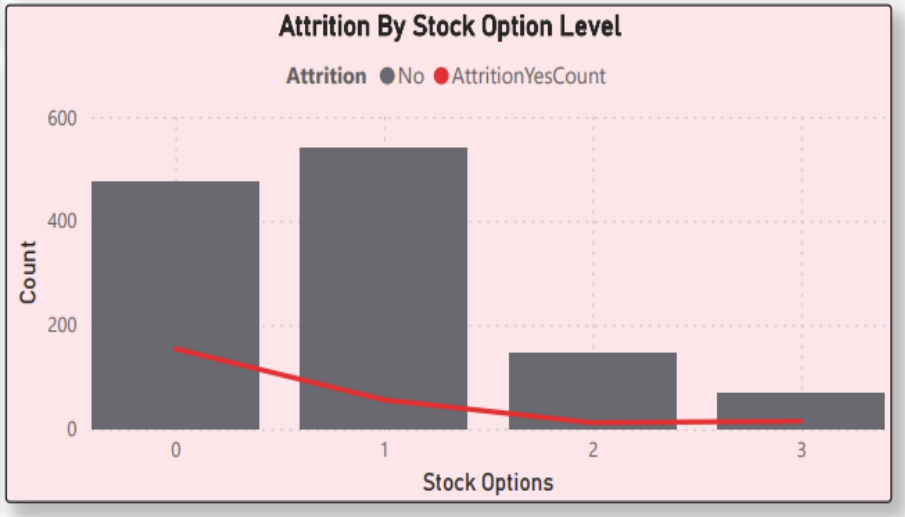
Attrition Inferential Analysis



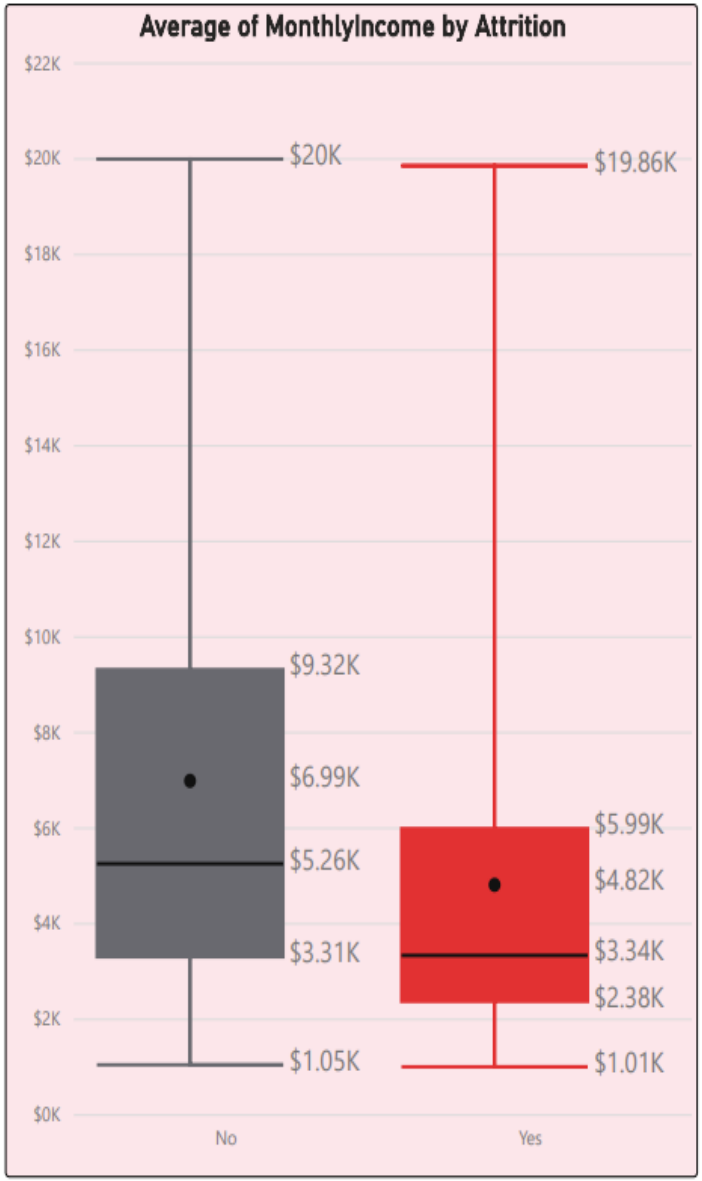






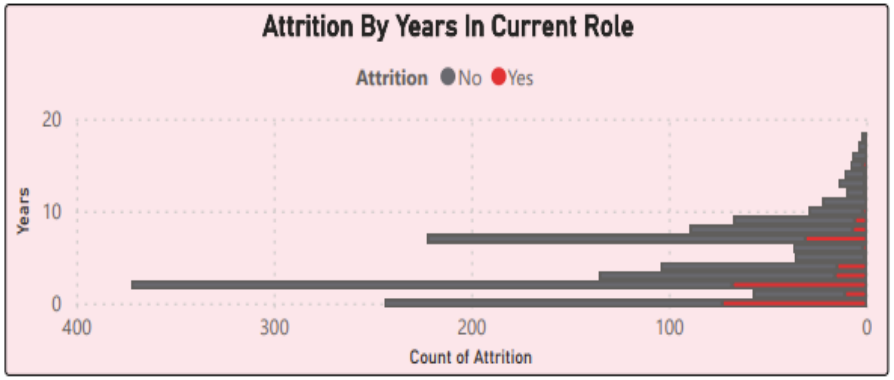


Attrition Inferential Analysis



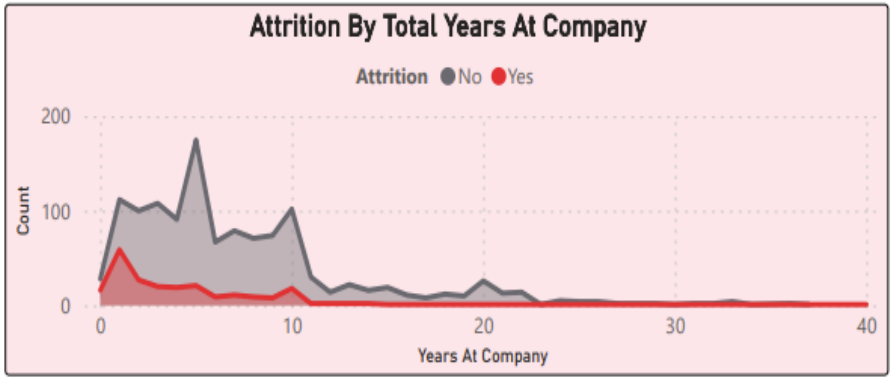
Average Monthly Income

$6.5K



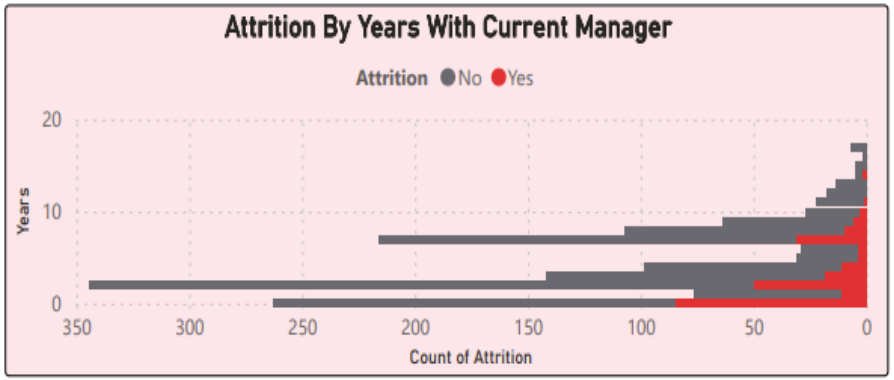
Average Percent Salary Increase

15.21



Average Years With Current Manager

4.12



Model Comparison

Model	Accuracy	Specificity	Sensitivity	F1-Score
Logistic Regression	86%	98%	35%	0.49
XGBoost	85%	99%	26%	0.39
KNN	83%	100%	9%	0.17
Random Forest	83%	100%	9%	0.17
Decision Tree	**85%**	**94%**	**43%**	**0.51**

- Based on these insights, **Decision Tree** seems to be the best model overall in this scenario because it has the highest F1-Score, indicating a better balance between precision and recall.
- It also has the highest sensitivity, making it more reliable for identifying positive cases, which in this case is a case of attrition.

Results & Discussion

Employee attrition is more likely seen in employees with/who	Employee attrition is less likely seen in employees with/who
• Live farther from work.	• Older employees.
• Higher percentage increase in their salary	• Higher monthly income.
• Worked in many companies before joining their current organization.	• Have been a part of the workforce for a longer time.
• Worked for the same company for many years.	• Spent greater amounts of hours in training.
• Low-medium environment satisfaction	• Have been in the current role for many years.
• Low-medium job involvement and satisfaction	• Worked with the same manager for many years.
• Less satisfied on the job	• Travel in some capacity
• Work overtime	• Higher stock options level in the company.

Business Implication

Holistic Compensation Approach

- Frequent compensation benchmarking
- Recognize long-serving employees

Dynamic Job Evolution and Internal Mobility

- Annual job description revision.
- Promote growth with compensation benchmarking and support
- Encourage lateral moves and cross functional assignments
- Promote engagement and satisfaction in both job and environment.

Business Implication

Enhancing Retention Strategies

- Recognize and value the expertise of older employees
- Invest in collaborative technology and tools
- Implement a rewards and recognition program
- Foster a culture of appreciation

Limitations and Scope of Study

Clarify job level and stock options	Update pre-COVID dataset	Improve gender inclusivity and inclusion of individuals with disabilities
Expand dataset to encompass a wider range of roles	Exploring variable interdependence through multivariate analysis	Focus mainly on relatively higher-income individuals.

References

Briques, S. (n.d.). *IBM Attrition*. https://sbriques.github.io/IBM-Attrition/

Tony Kwang Hyun Kim. (2020). IBM Attrition Dataset Analysis https://rstudiopub-static.s3.amazonaws.com/712435_f134ef344f32490dbab2fdf610ce93b0.html

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