

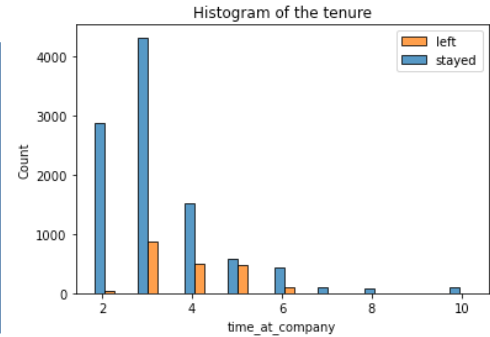
# Sailfort motor project : Executive summary Employee attrition analysis

## Overview

The primary objective of this project is to analyze the factors contributing to employee attrition within the Sailfort company. We performed analysis and machine learning model to identify key predictors and insights to provide actionable recommendation to improve employee retention.

## Key insights and findings

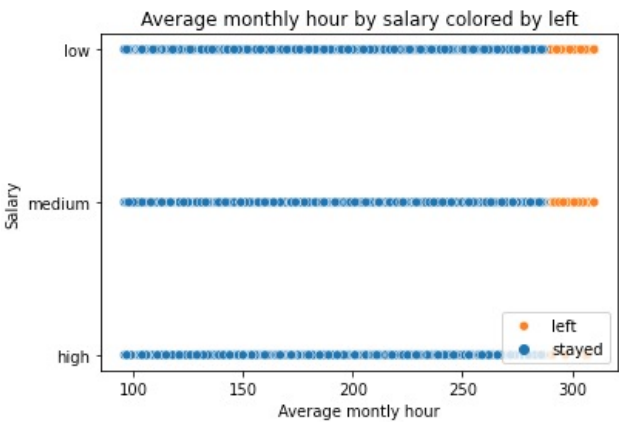
Correlation between attrition and the number of projects, average monthly hours, and tenure. This could indicate potential management issues. Higher salary correlates with lower attrition. Highest resignations between 3-5 years, employees tend to stay after 6 years. Attrition negatively correlated with satisfaction level but positively with tenure.



## Model performance

The logistic regression model does not perform very well, with an F1 score of 0.320 and a precision score of 0.44. The single decision tree model shows good performance with an F1 score of 0.942. The random forest model slightly outperforms the decision tree model with an F1 score of 0.946, balancing feature importances better.

Model	F1	Recall	Precision	Accuracy
Random_Forest_test	0.955255	0.921687	0.991361	0.985657
Decision_Tree_test	0.947585	0.925703	0.970526	0.982989
Random Forest	0.946608	0.908900	0.987665	0.982987
Decision tree	0.942882	0.918271	0.969020	0.981541
Logistic Regression	0.320819	0.249558	0.449045	0.821844



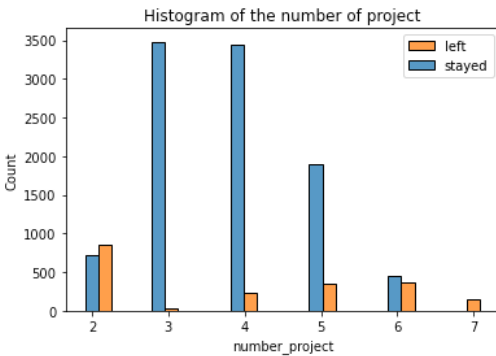
## Critical Factors

The most important features in predicting attrition are satisfaction level, last evaluation, number of projects, and tenure.

Considering potential data leakage, we recommend reevaluating the analysis without the last evaluation and satisfaction level columns, as these factors may not be consistently measured and could be biased by employee's intentions to leave.

## Recommendations

- Limit Overwork:** Cap the number of projects per employee to 3 or 4 to prevent overwork.
- Promote Work-Life Balance:** Emphasize the company's stance on work-life balance and discourage rewarding employees for working longer hours.
- Encourage Longevity:** Promote employees who have been with the company for over three years to improve retention.
- Revise Evaluation Criteria:** Adjust evaluation methods to focus more on contributions and less on hours worked, ensuring high scores are not reserved for those exceeding 200 hours per month.
- Enhance Company Culture:** Foster a positive culture regarding working hours and overall employee well-being.



## Next steps

Reperform the analysis without the last evaluation and satisfaction level features to eliminate potential data leakage. Explore additional analyses, such as K-means clustering, to gain further insights into employee groups and their specific needs.