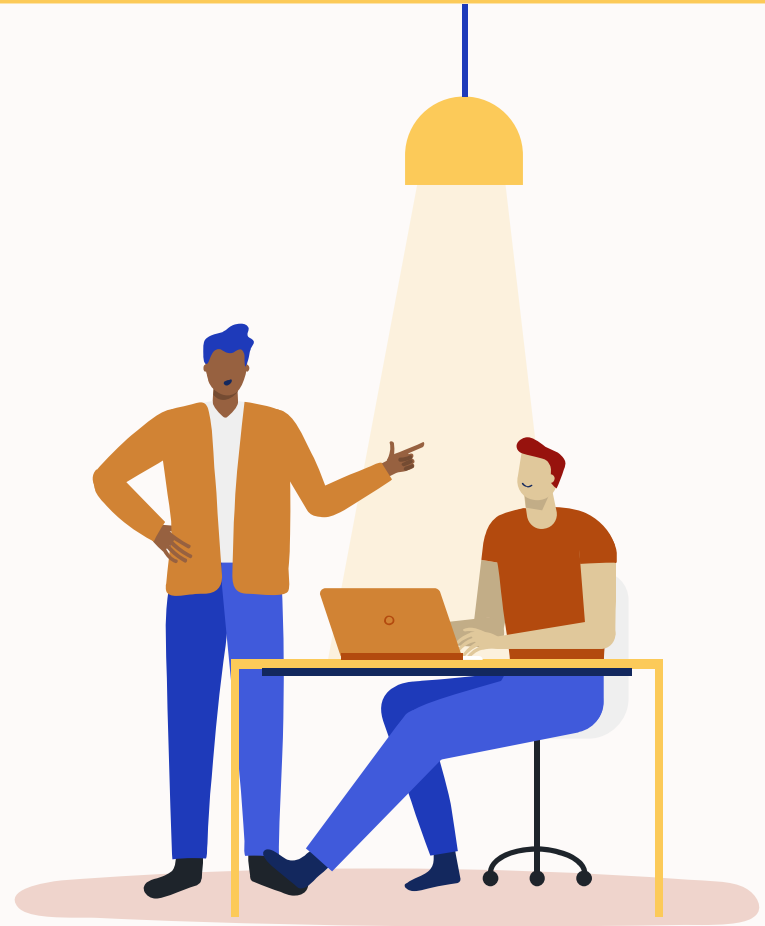


# Employee Retention Data Analysis

John Cedrick Napa



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# Project Overview

- **Statement of the Problem:**
  - Low Employee Retention of Salifort Employees
- **Purpose of the Analysis:**
  - Understand the factors affecting employee retention and decrease the turnover rate of Salifort Motors employees.
- **Main Stakeholders:**
  - Salifort Motor Human Resources Department
  - Senior Leadership Team



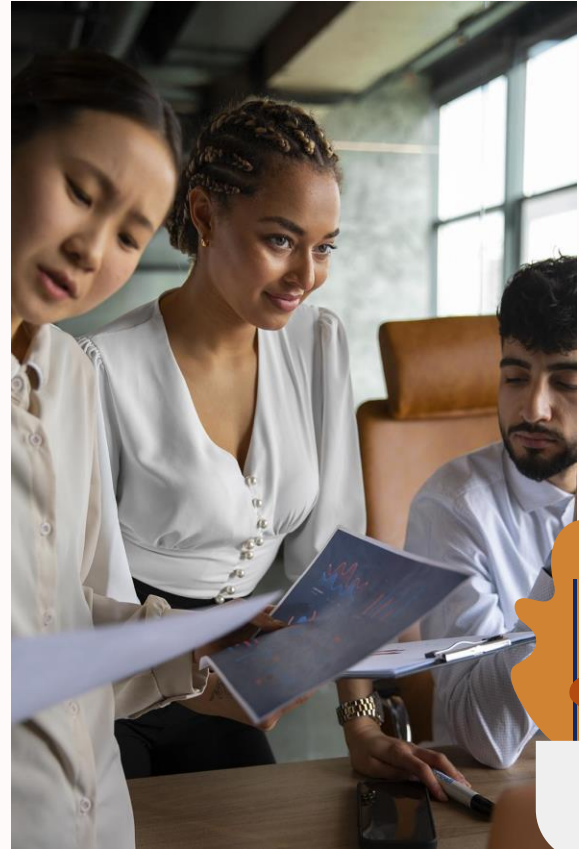
# Project Overview

- **Goals:**
  - Determine key **factors** affecting employee retention
  - Create a **predictive model** to guide the business how to proceed and tackle the problem.



# Data Overview

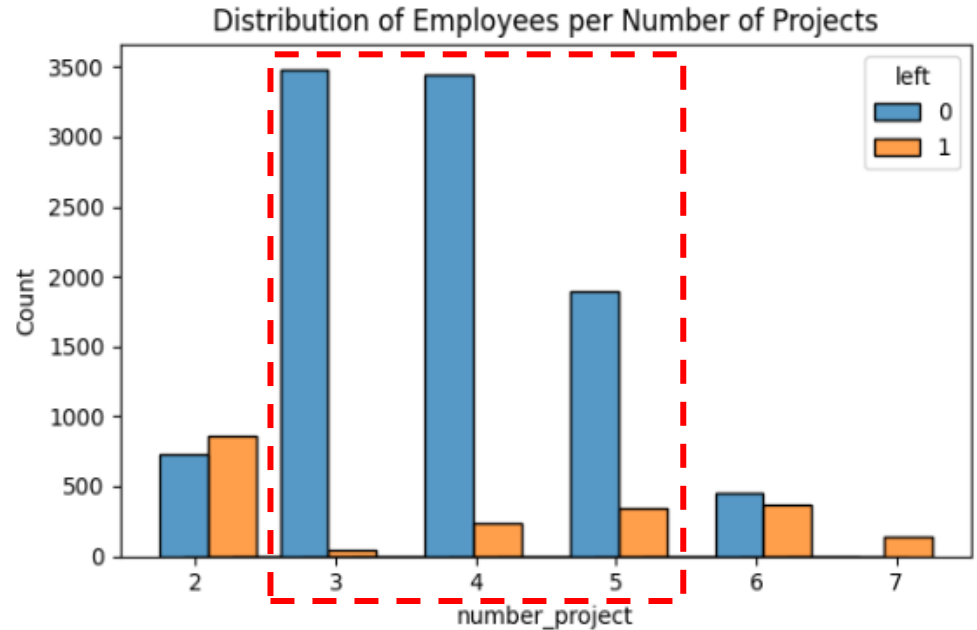
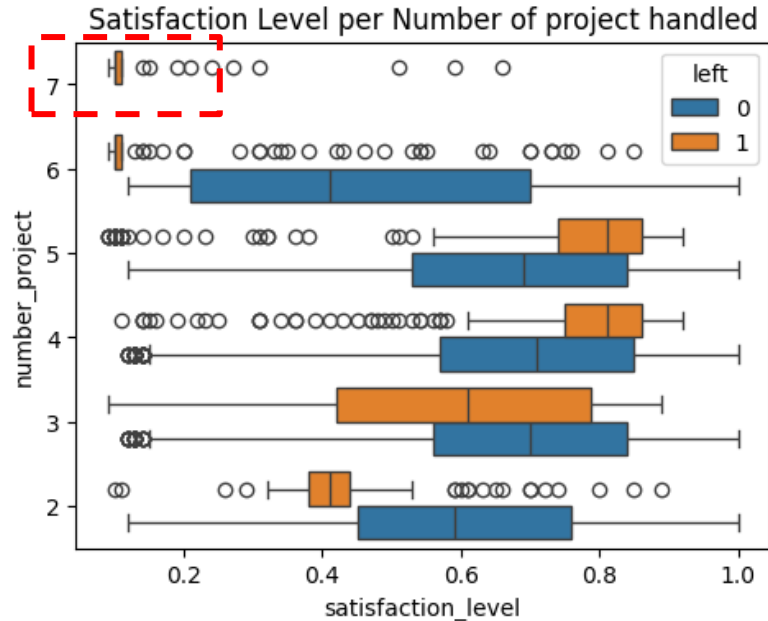
- **Factors Evaluated:**
  - Satisfaction level
  - Previous evaluation score
  - Number of Projects
  - Tenure
  - Promotion
  - Departments
  - Salary



# Data Analysis

## Satisfaction Level

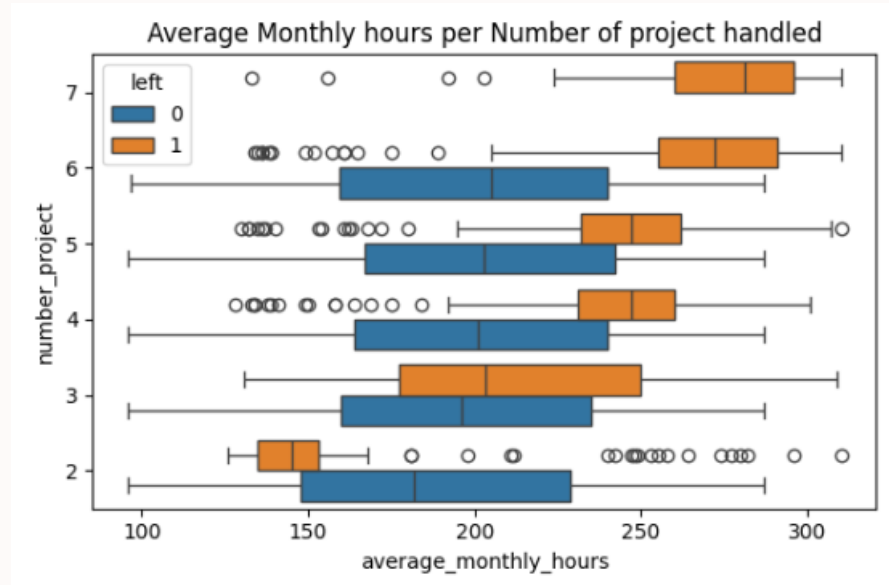
- Employees who are handling **7 projects** at a time **all left** with a very low satisfaction score
- **3-5 projects** showed acceptable satisfaction level scores and employee retention



# Data Analysis

## Satisfaction Level

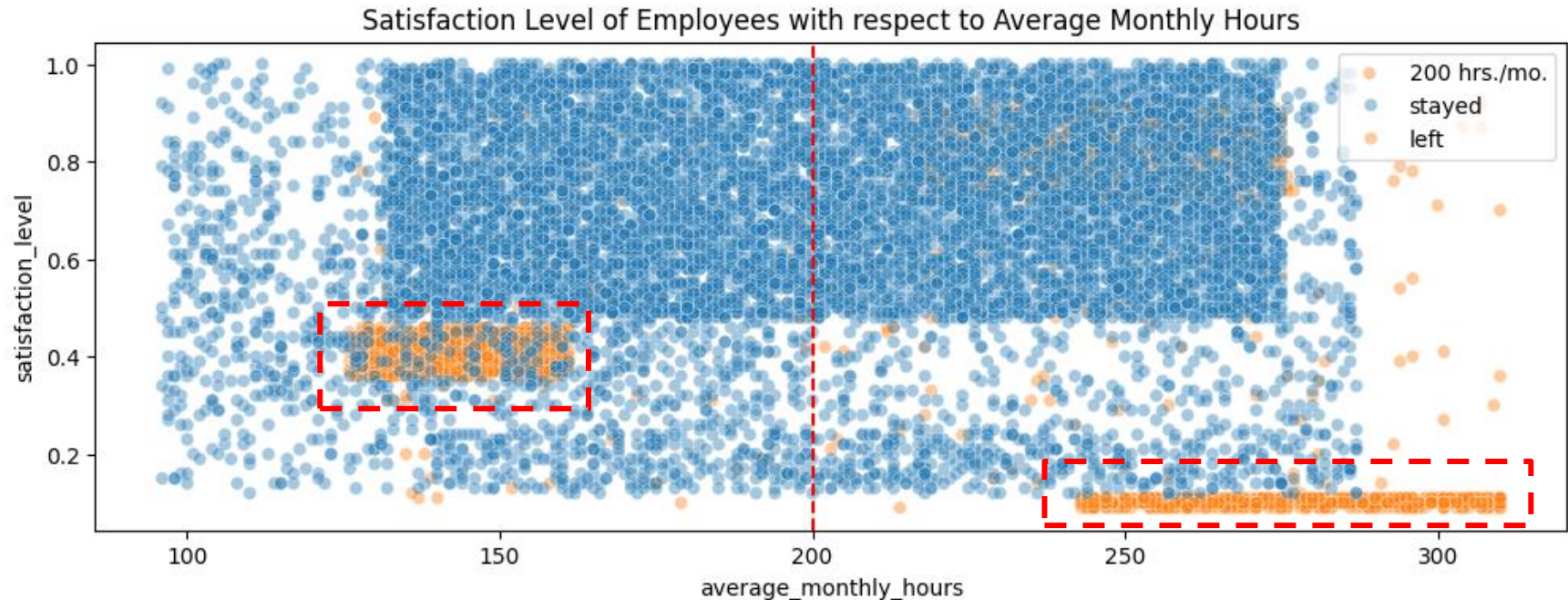
- Employees who properly managed or practice acceptable working hours of about 200 hours stayed even with increasing work load
- Majority of the employees who left were working more than 200 hours per month.
- **Inference:**
  - People who left probably felt **overworked and drained** due to long working hours



# Data Analysis

## Satisfaction Level

- Overworked employees who left had **near to zero** satisfaction scores
- Group of employees with relatively low working hours left. Inferred to be the employees who were fired

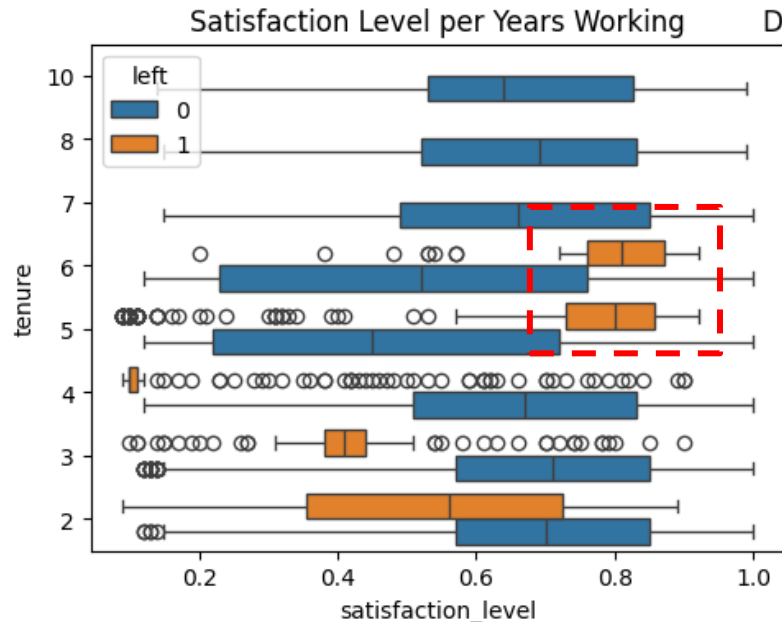




# Data Analysis

## Tenure

- Employees who has stayed for more than **7 years** had high satisfaction level. Additionally, no employee left.
- A group of highly satisfied employees with **5-6 years** working experience in the company still left.
- Majority of the employees who left were **3-5 years** in the company

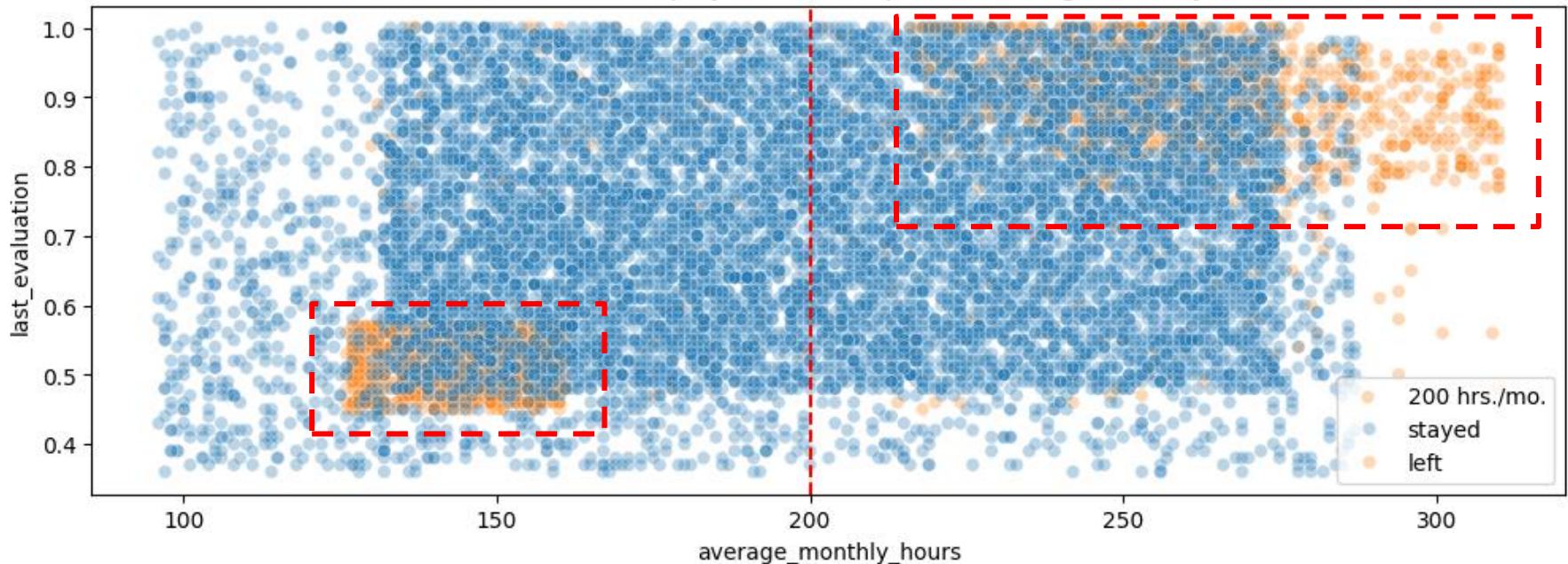


# Data Analysis

## Evaluation Score

- Employees who has stayed for more than **7 years** had high satisfaction level. Additionally, no employee left.
- A group of highly satisfied employees with **5-6 years** working experience in the company still left.
- Majority of the employees who left were **3-5 years** in the company

Evaluation Score of Employees with respect to Average Monthly Hours



# Data Analysis

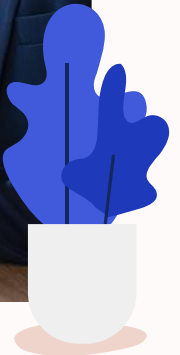
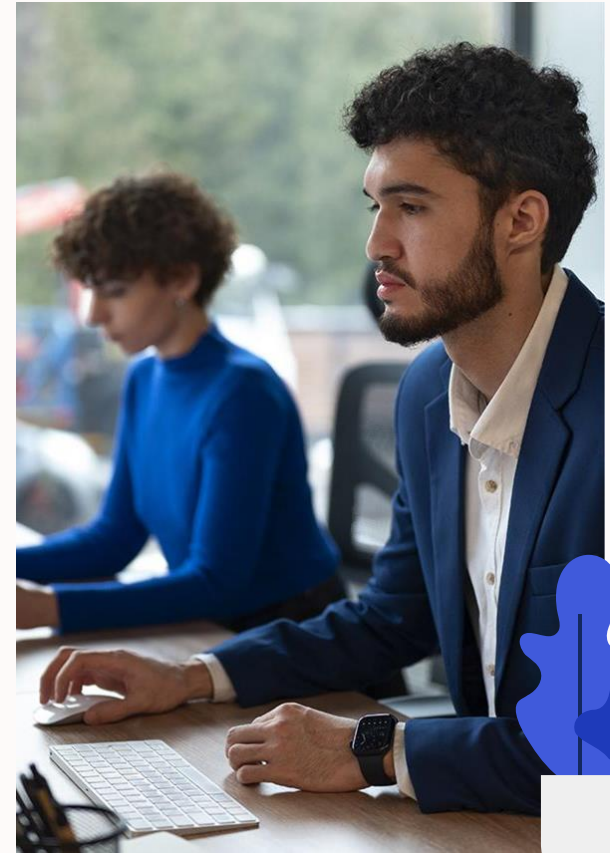
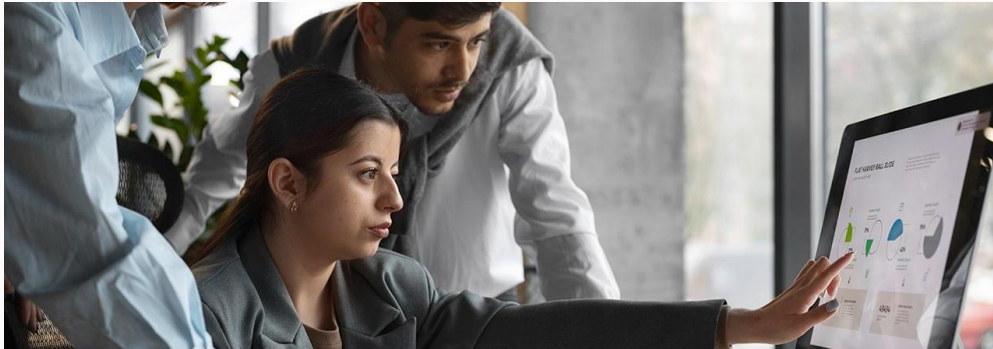
## Promotion

- Very few were promoted in the last 5 years (only 203 employees)
- Promotion is not highly dependent on average monthly hours
- Most people who left worked **overtime**



# Machine Learning Modeling

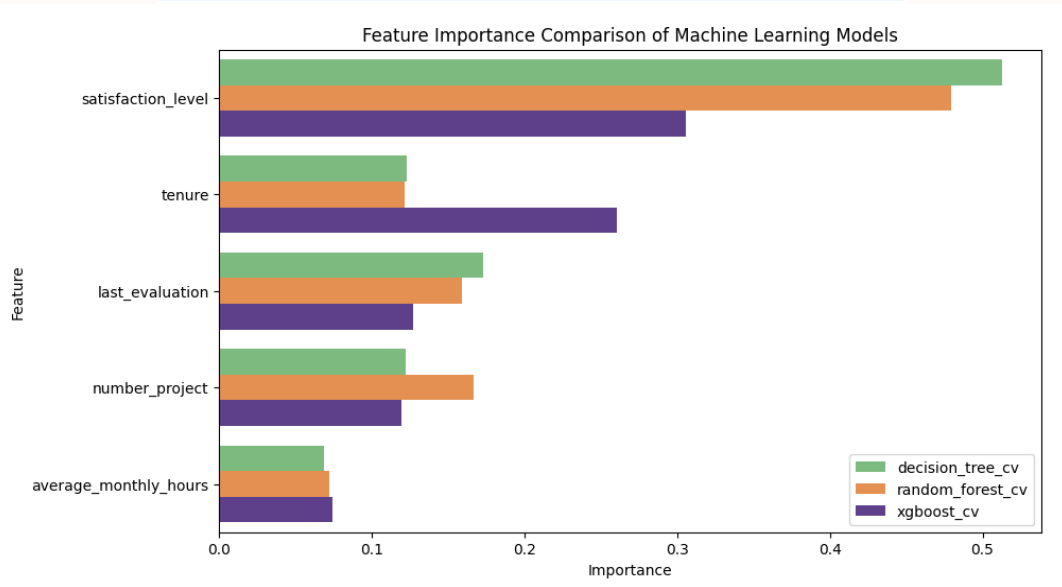
- Logistic Binomial Regression
- Decision Tree Classifier
- Random Forest Classifier
- XGBoost Classifier



# Machine Learning Modeling

	model	precision	recall	f1	accuracy	AUC
0	Logistic Regression	0.790556	0.819484	0.799963	0.819484	0.596967
0	Decision Tree CV Test	0.958506	0.927711	0.942857	0.981321	0.959855
0	Random Forest CV Test	0.958333	0.923695	0.940695	0.980654	0.957847
0	XGBoost CV Test	0.978769	0.925703	0.951496	0.984323	0.960851

- The four machine learning models showed good metric scores with the **XGBoost Model** having the highest test **AUC score 96.09%**



- Results of the feature importance indicates that the following had the greatest impact on whether an employee leaves or stays:
  - Satisfaction Level
  - Number of Projects
  - Tenure
  - Average Monthly Hours
  - Evaluation Score

# Recommended Course of Action



- Limit the number of projects assigned to an employee to **2-4 projects** only.
- Implement rules on work hours, either rewarding for working longer hours or **cap the working hours** to a reasonable amount keeping an eye on overwork signs.
- **Streamline evaluation scoring** for employees putting more score weight on contribution and effort
- Evaluate and discuss about **company culture** across different departments

