



SALIFORT MOTOR PROJECT

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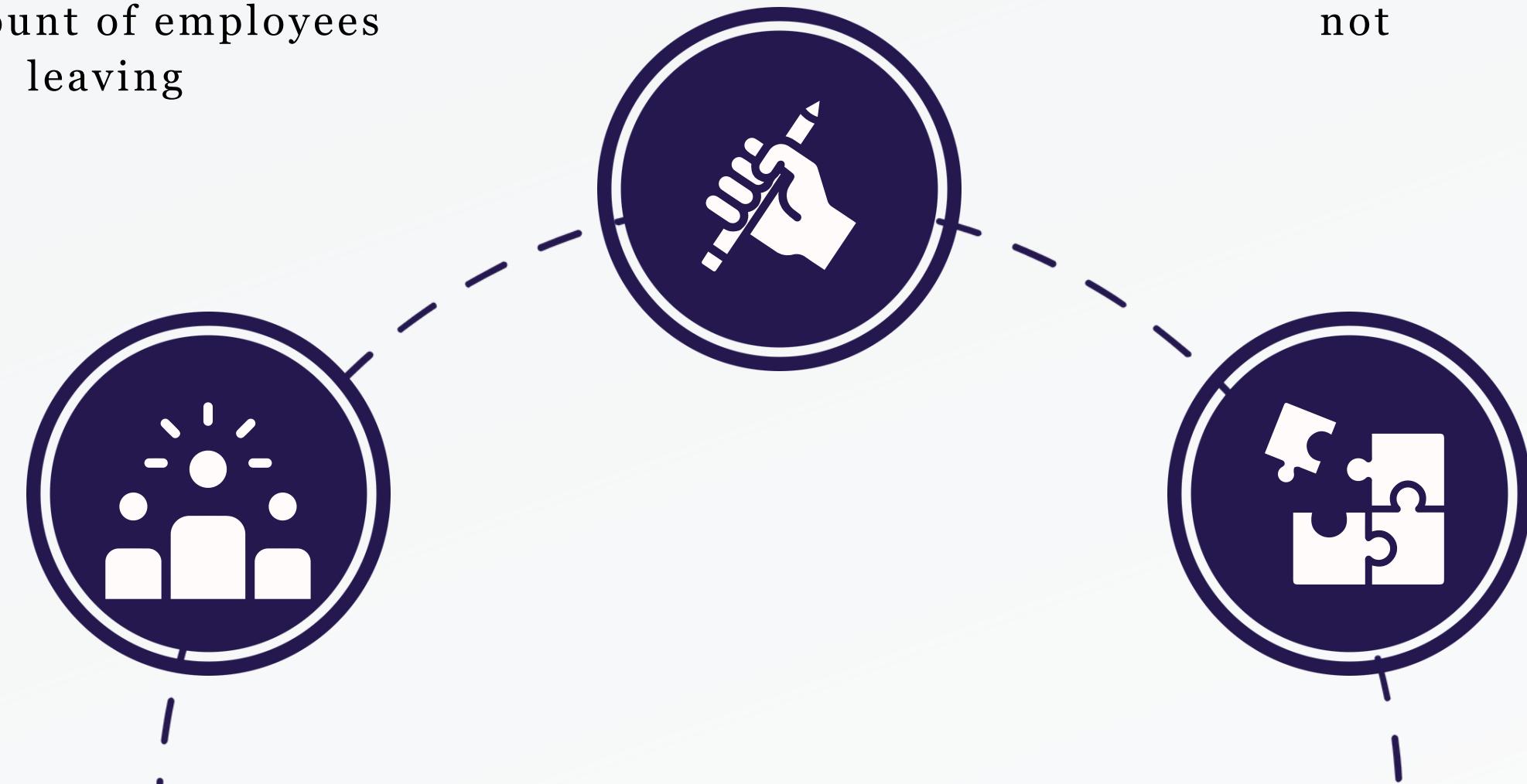
PROJECT OVERVIEW

Problem

Salifort Motors is experiencing high employee turnover and they are concerned about the amount of employees leaving

Goal

The goal of the project is to build a model that will predict if an employee will leave or not

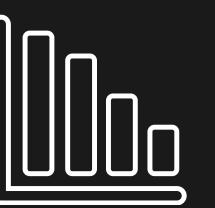


SOLUTION PROCESS



Data

- The data was collected by the HR department
- Sample Survey of 15,000 employees
- The dataset contains 10 columns and 14,999 rows



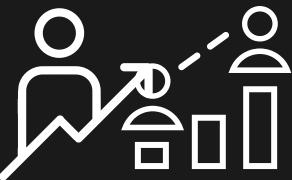
Analytical Approach

- Use Supervised Machine Learning Models
- Random Forest, XGBoost and Logistic Regression



Modeling Prep

- The data was split into training, test and validation sets (60/20/20 split)



Model Performance

- Check evaluation metrics (Accuracy, Precision, F1 and Recall scores)
- Confusion Matrix

MODEL COMPARISON

Logistic Regression Model

Precision Score



Recall Score



F1 Score



Accuracy Score



Random Forest Model

Precision Score



Recall Score



F1 Score



Accuracy Score



XGBoost Model

Precision Score



Recall Score

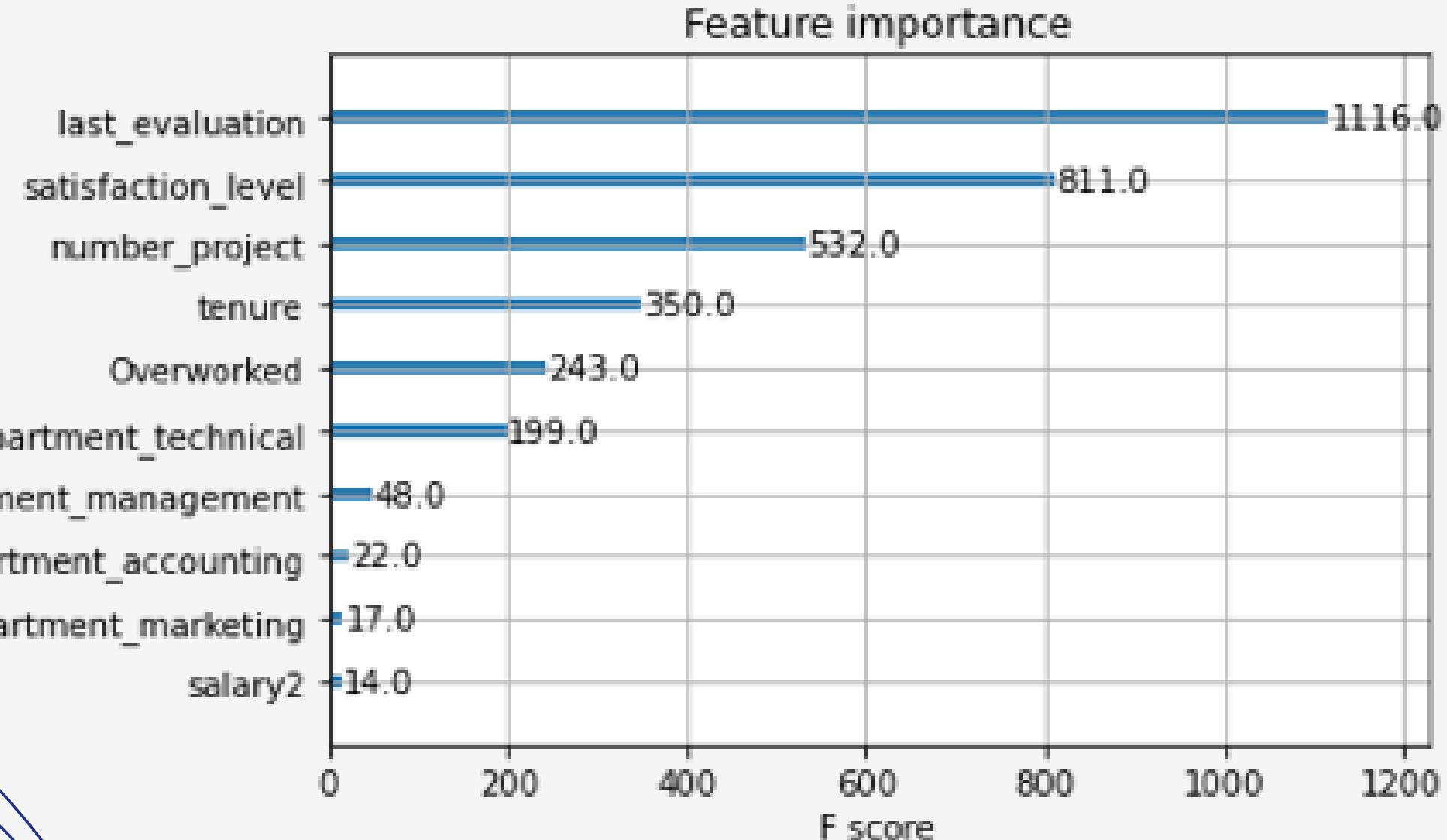


F1 Score



Accuracy Score





Key Findings

TOP PREDICTIVE FEATURES

- The top five features that help predict if an employee will leave are:
 - Last Evaluation
 - Satisfaction Level
 - Number Projects
 - Tenure
 - Overworked

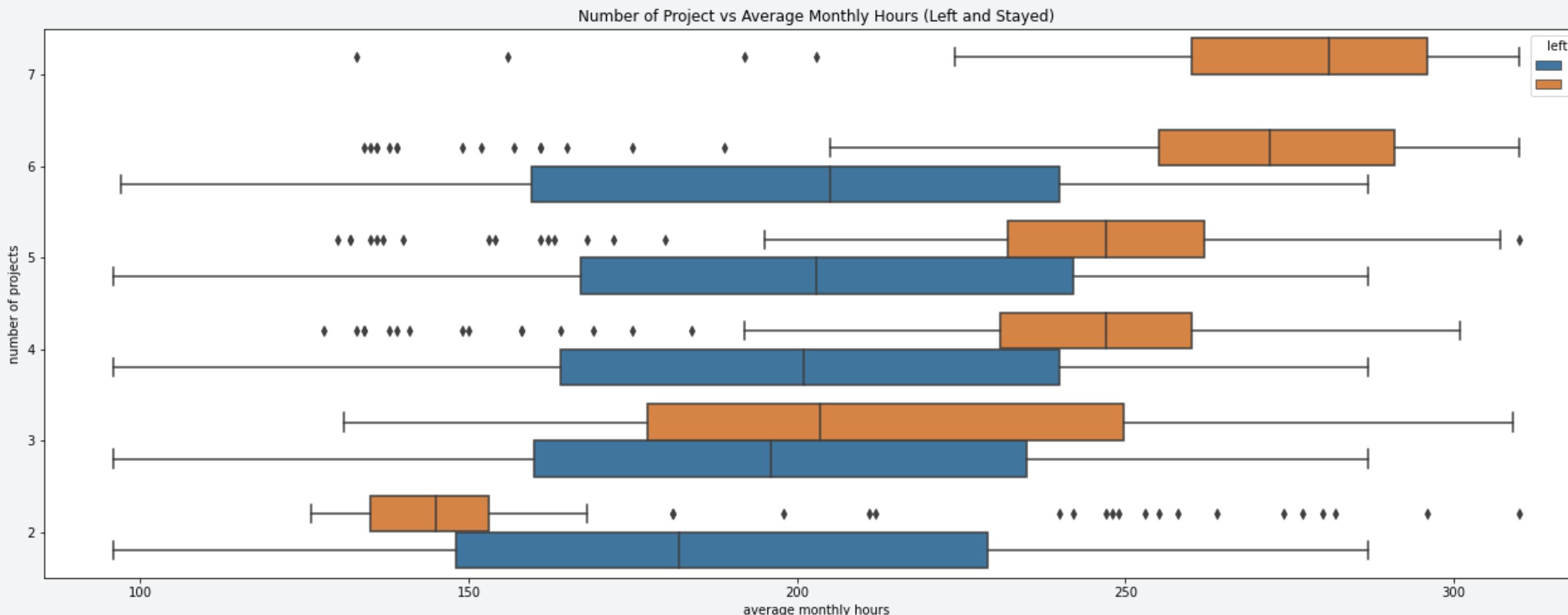
LAST EVALUATION VS. MONTHLY HOURS

- The average monthly working hours is 167 hrs/month
- The scatterplot shows that many of the employees worked well over the average monthly hours
- Two main groups of employees that left;
 - Group that were overworked and had high evaluation scores
 - Group that worked below the monthly average and received low evaluation scores



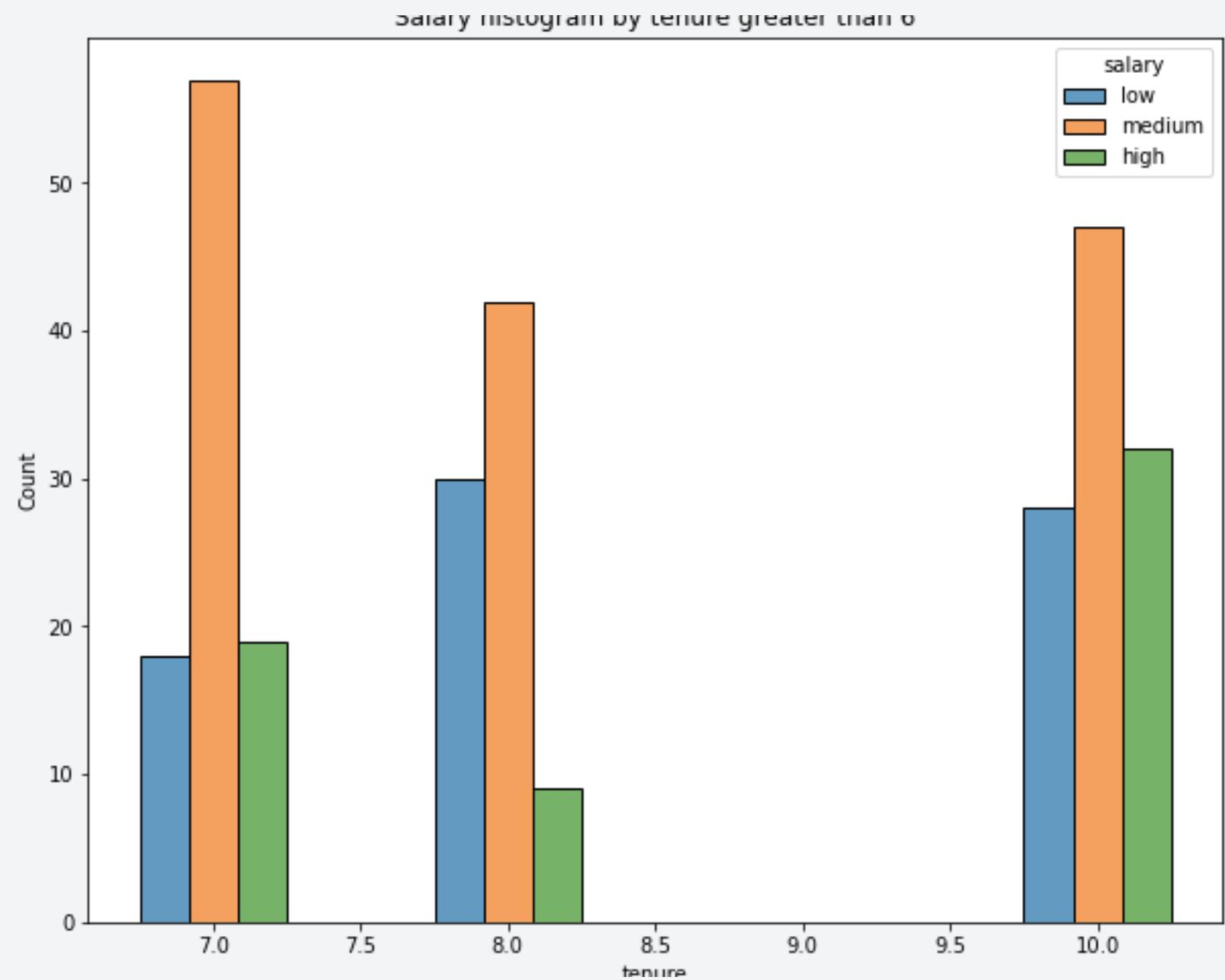
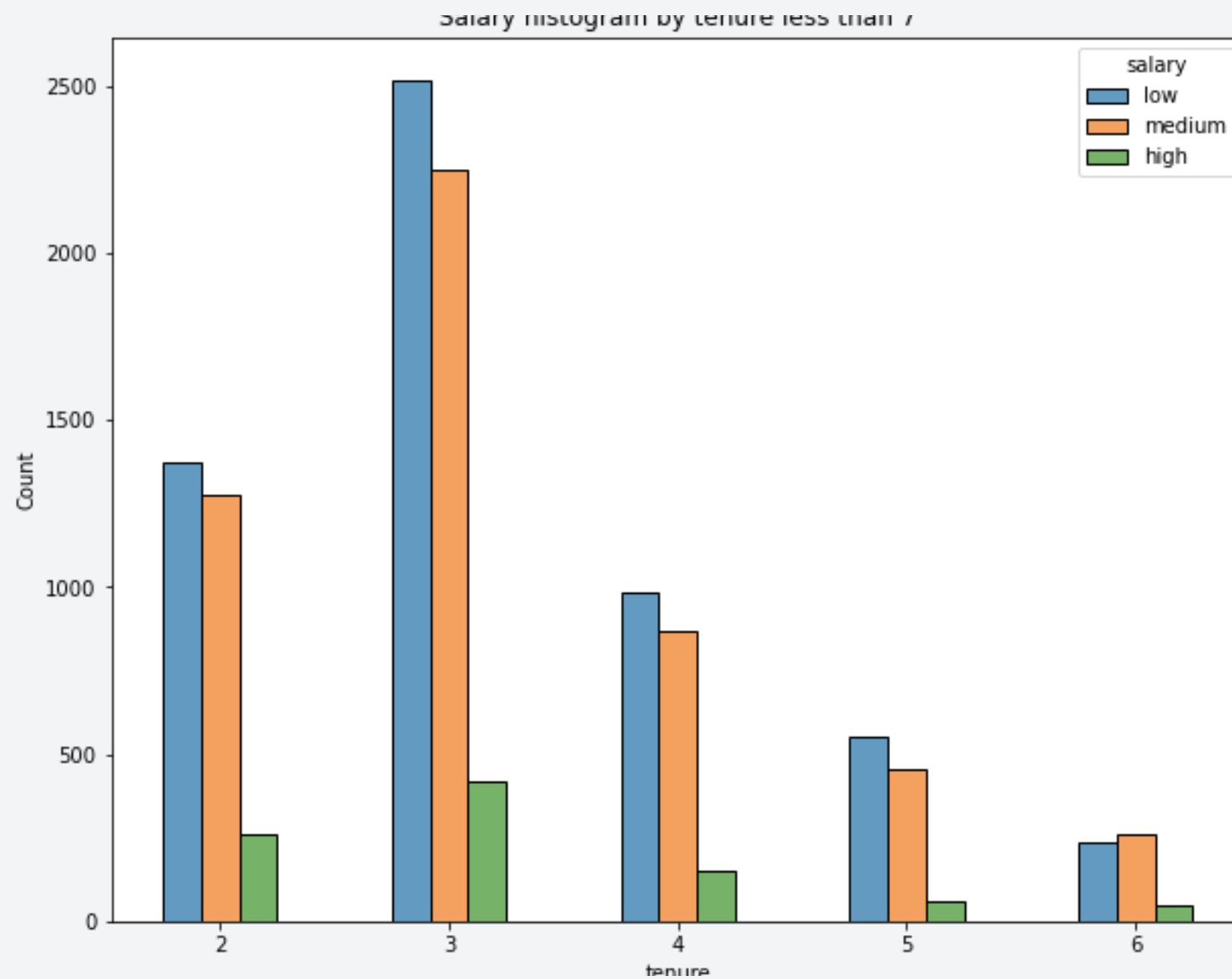
MONTHLY HOURS VS. NUMBER PROJECTS

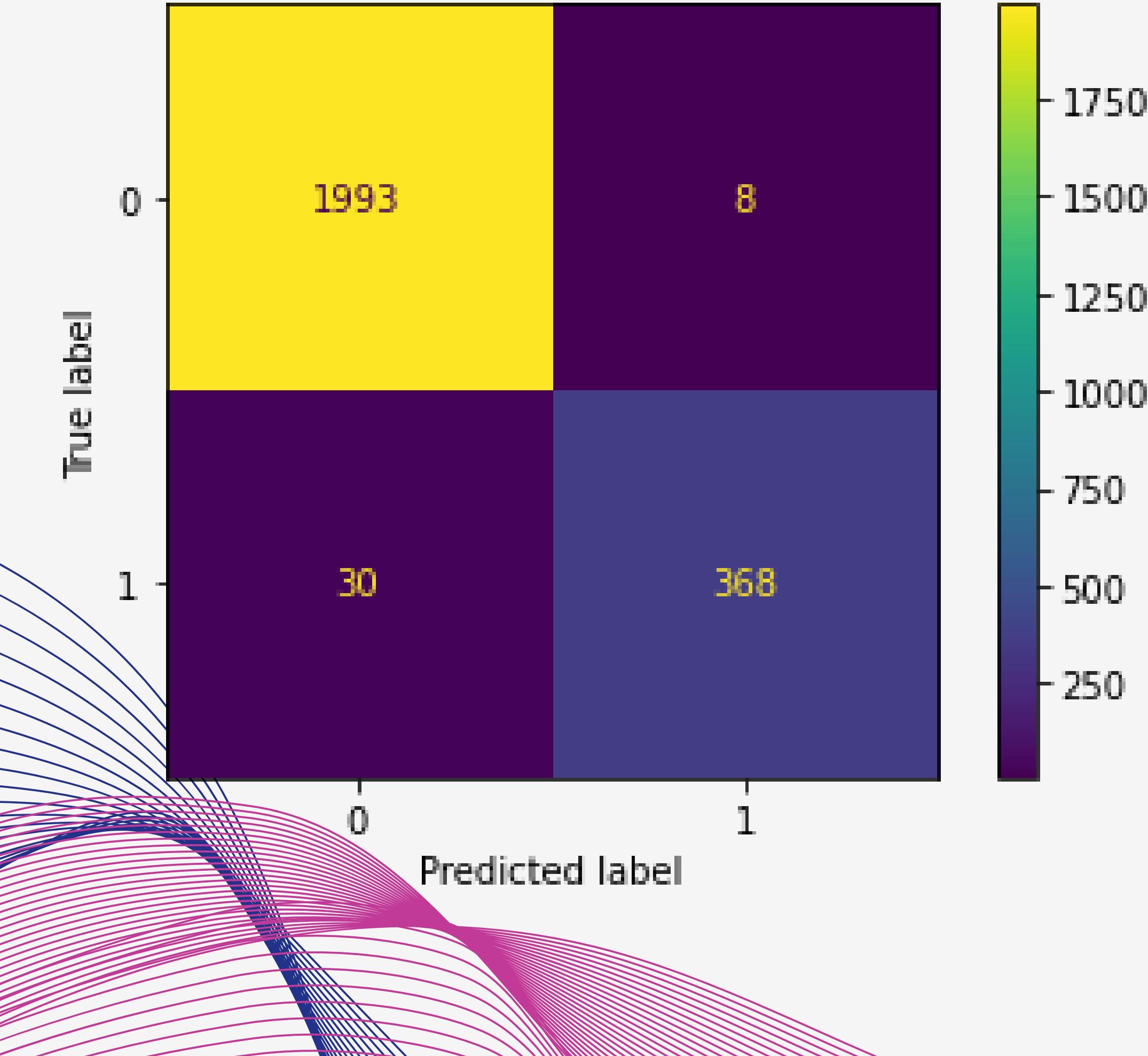
- With the employees who left (in orange) we see that the more projects they had, the higher number of hours they worked
- At the top of the plot, those who worked on 7 projects were only employees who left and worked more than ~250hrs/month



TENURE VS. SALARY

- Higher tenure does not equate to a higher salary





Key Findings
continued..

CONFUSION MATRIX TABLE

- The model correctly identified ~94% of employees that 'left'.
- The model identified 3x as many False Negatives than it did False Positives

Recommendations

1. As employee tenure goes up, so should their salary.
2. There needs to be a better scale for evaluations.
3. There should be better management on dividing projects up between employees. If an employee is going to take on more projects and more hours there should be an incentive of higher pay or higher overtime pay.

Next Steps

1. To acquire a sample from employees that are not in line to possibly being fired.
2. It may be wise to conduct a survey/building a predictive model on each individual department.
3. Have a discussion or take a survey on company culture, would be beneficial. Maybe having questions about employee benefits, work life balance or even work culture would be beneficial.

Thank You
