



Human Resource Analysis

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Business Goal

HR turnover data

Help companies determine what causes employees to leave as studies suggest that the average cost of employee turnover is 6 to 9 months salary of that employee

We want to determine what variables are causing employees to leave, in order to help keep turnover costs down



Dataset Description

Source: <https://www.kaggle.com/ludobenistant/hr-analytics/data>

Features:

Seed #671329

1. Satisfaction Level - Numeric
2. Last Evaluation - Numeric
3. Number of Projects - Numeric
4. Monthly Hours - Numeric
5. Years with Company - Numeric
6. Workplace Accident - Categorical
7. Promotion last five years - Categorical
8. Department Worked For - Categorical
9. Salary - Categorical
10. Target variable: Left - Categorical



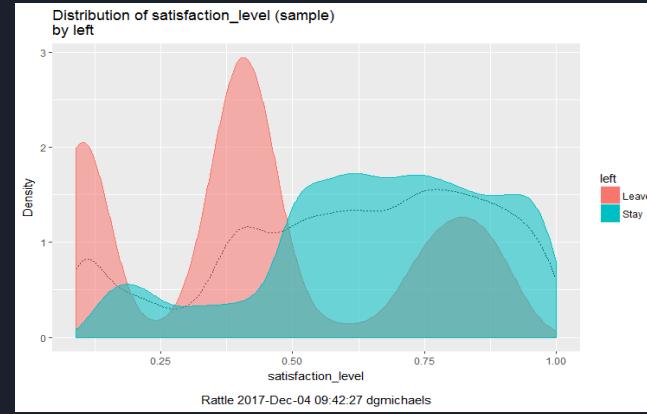
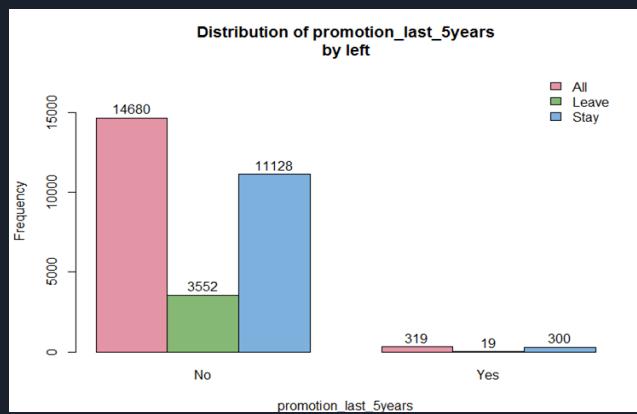
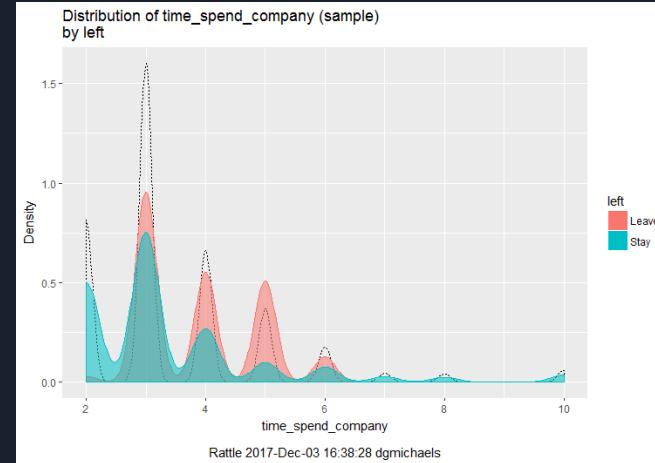
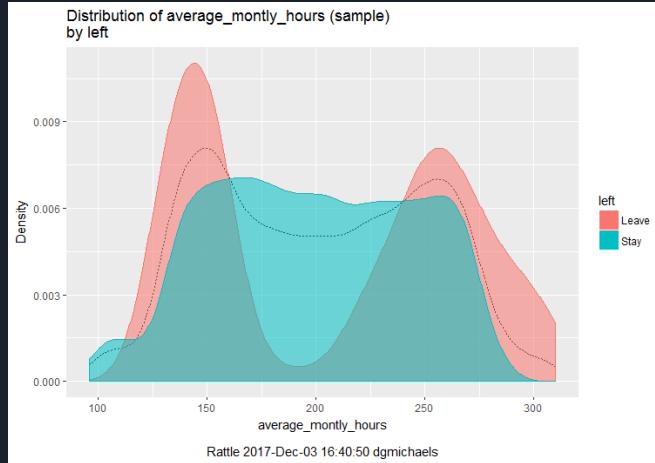
Data Mining Goal

Predict what variables are significant in determining whether an employee leaves

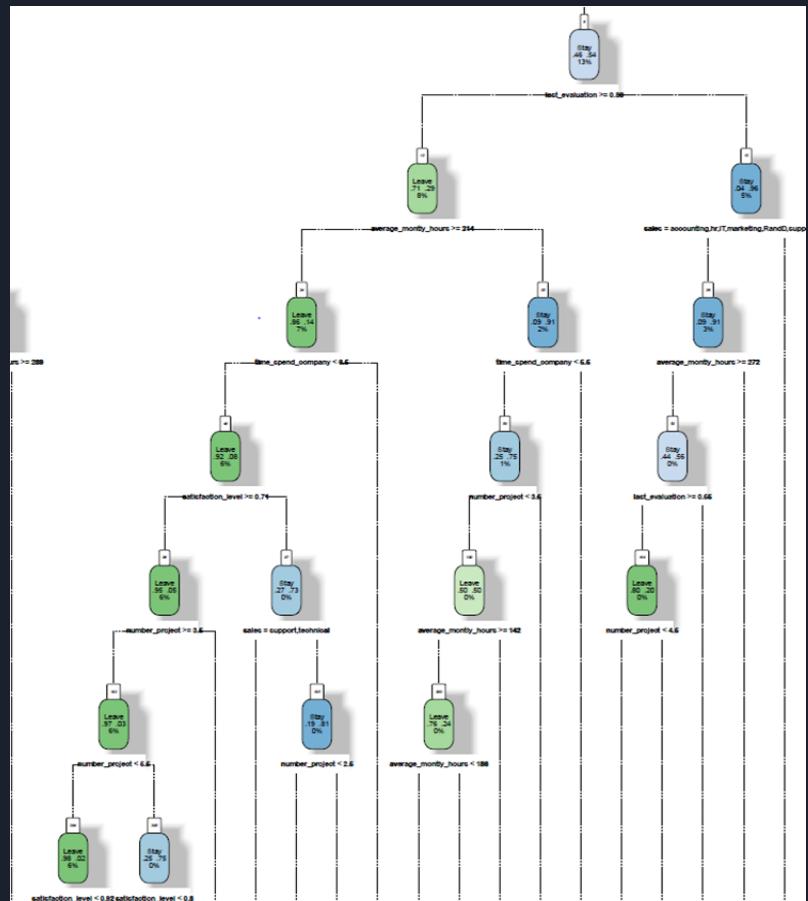
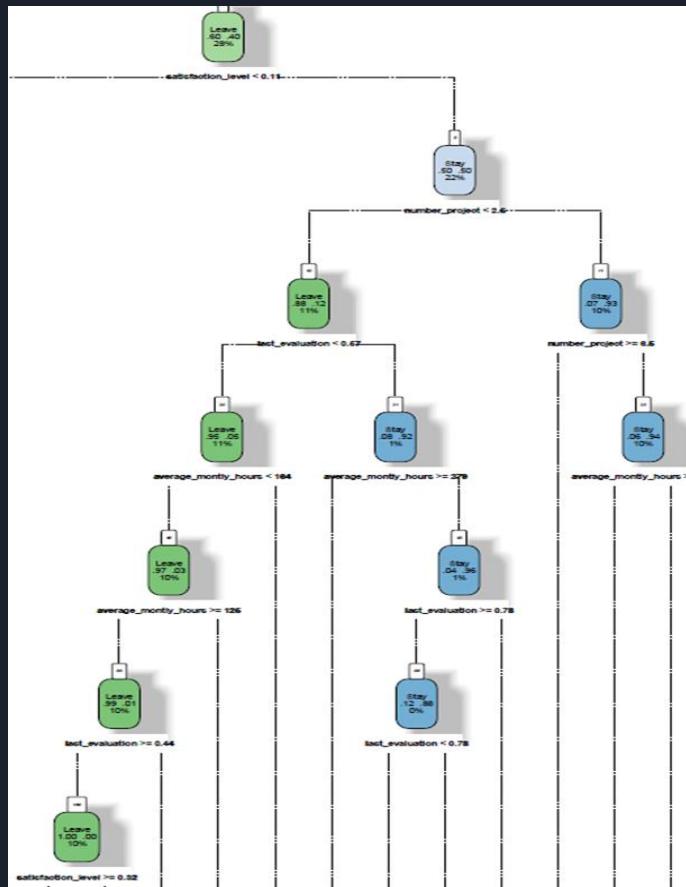
Supervised

Classification

Exploratory Analysis



Decision Tree Model



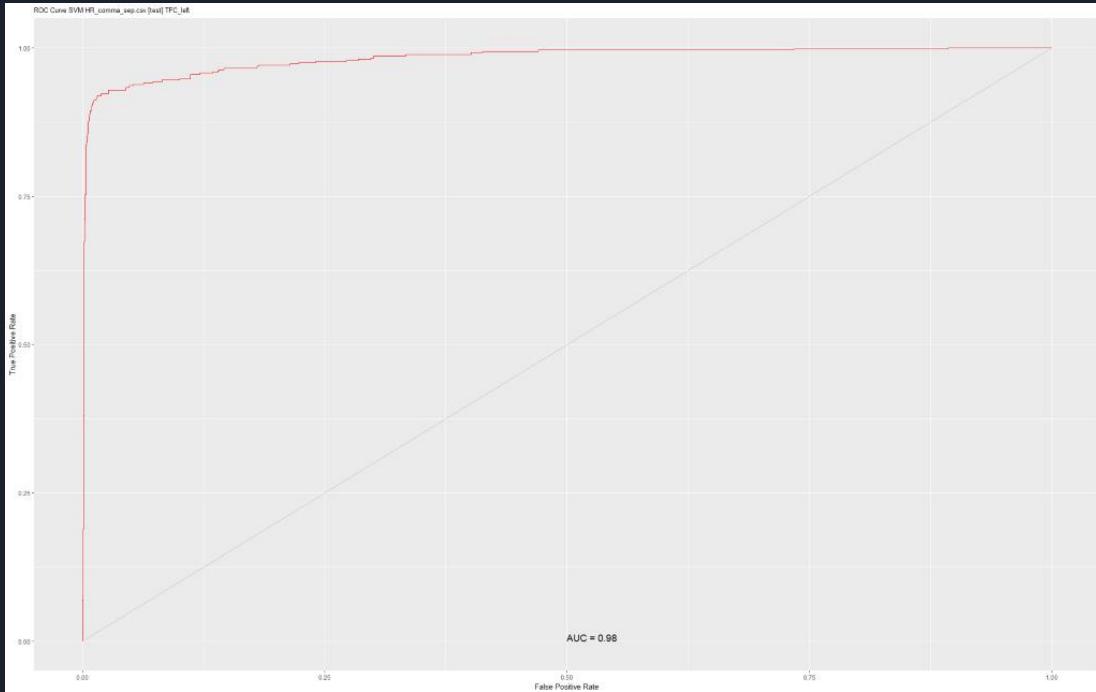
SVM

RBF C=1

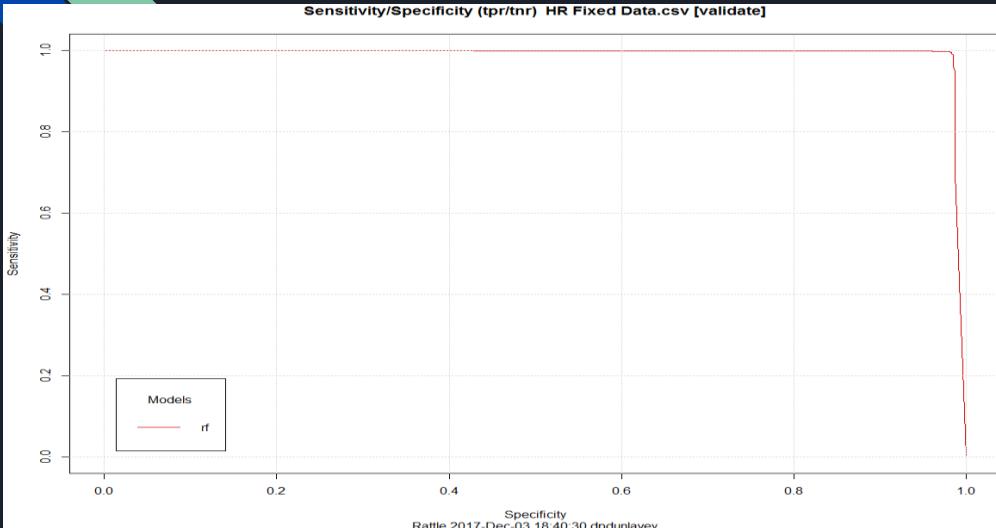
Error of 3%

Soft Margin

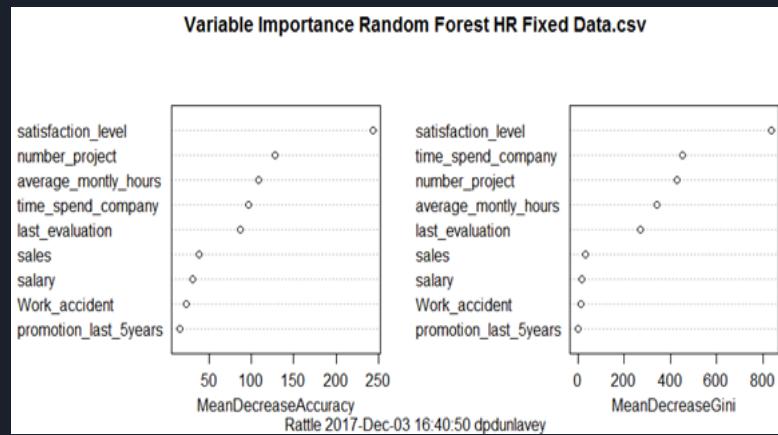
ROC Curve



Random Forest Model



- TP = 2408 observations
- FN = 27 observations
- False Negative Rate = 1.1%
 - Type II error





Conclusions/Insights/recommendations

Satisfaction level, average number of monthly hours, and promotion within the last 5 years are the most important factors

This random forest is useful because we can use it best to predict which variables are a greater factor in employees leaving. Employers could then use the information to focus their efforts on those employees and prevent high turnover cost.

We recommend employers keep average monthly hours between 150 and 240 and to keep satisfaction levels above a .5. You could meet with employees with low satisfaction levels and talk about what would keep them happier on the job.

To improve the model we could add more features and indicators on satisfaction levels to see what drives employee satisfaction.