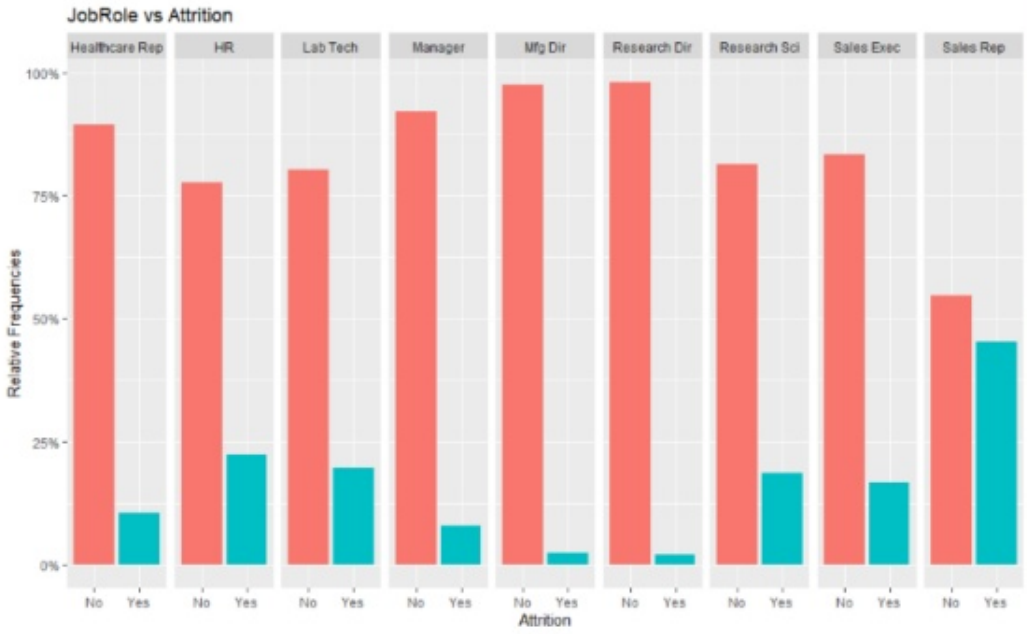
DDS Analytics
Attrition Analysis
Jenna Ford
08/17/2019
Job Role Trends
Attrition Prediction
kNN
Attrition Prediction
Logistic Regression
Monthly Income Prediction

Attrition by Job Role



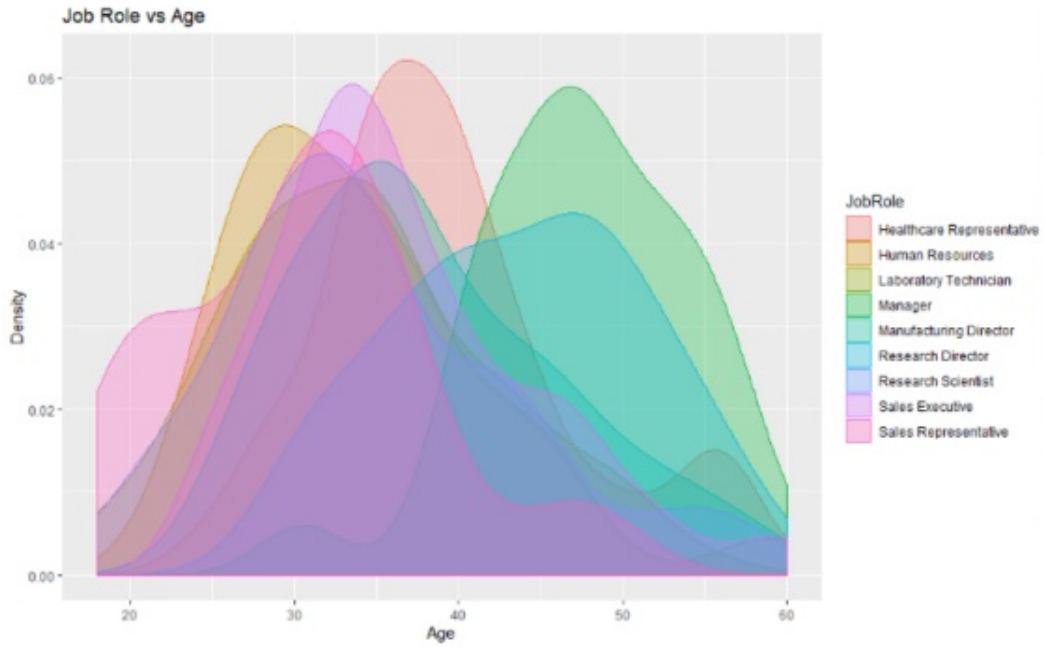
Sales Reps have the highest attrition % at 45%

Age

Gender

Years at the Company

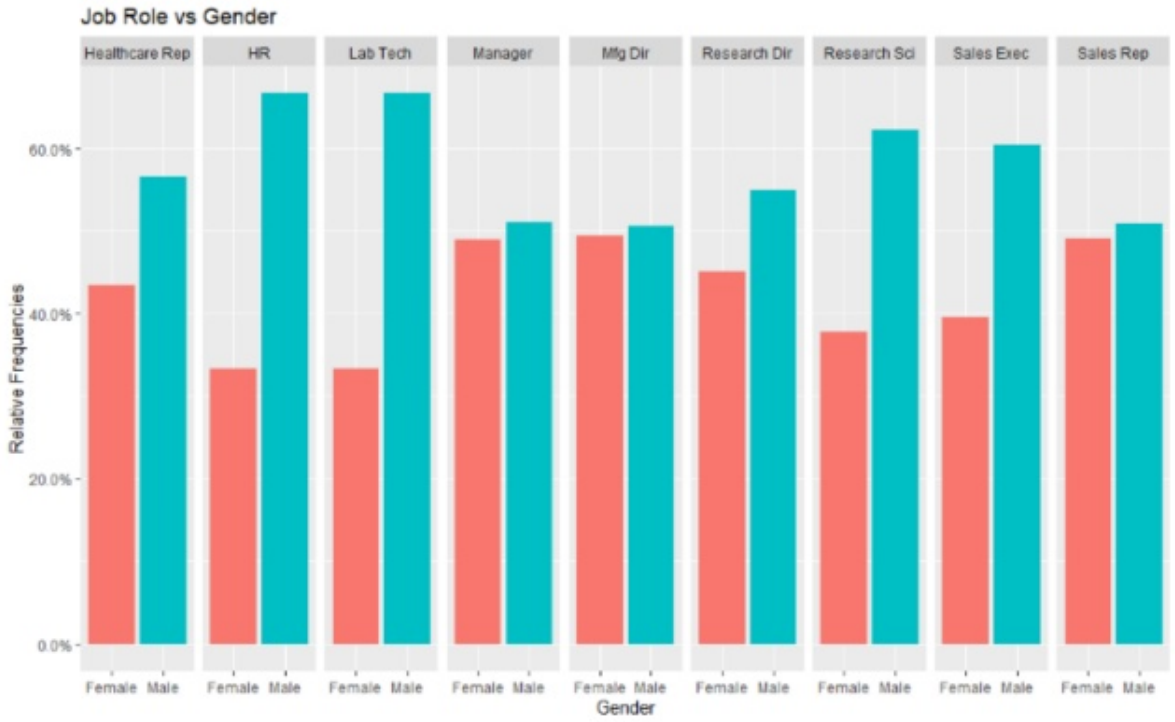
Age by Job Role



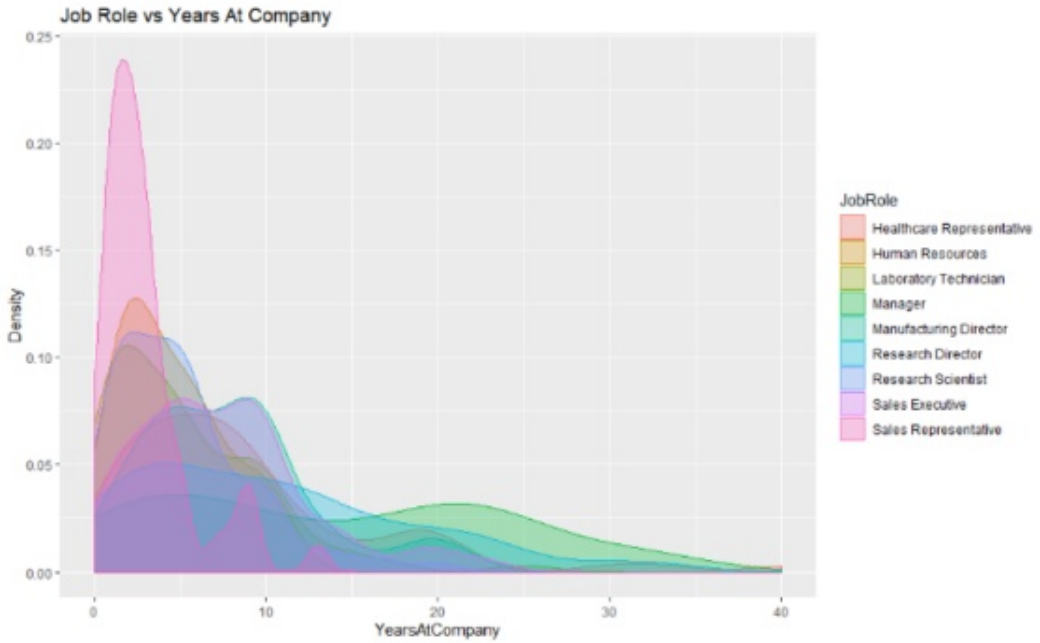
Managers have the highest avg age at 48

Gender by Job Role

- **Human Resources & Laboratory Technicians: 67% men, 33% women**
- Managers, Manufacturing Directors, & Sales Representatives: nearly 50%/50% split



Years at the Company by Job Role



83% of Sales Reps have been at the company less than 5 years

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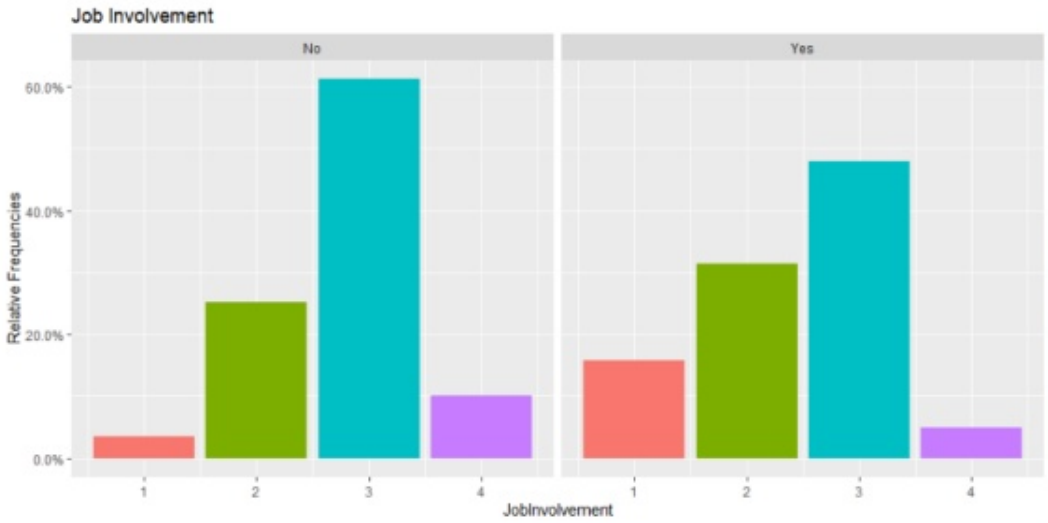
Job Involvement



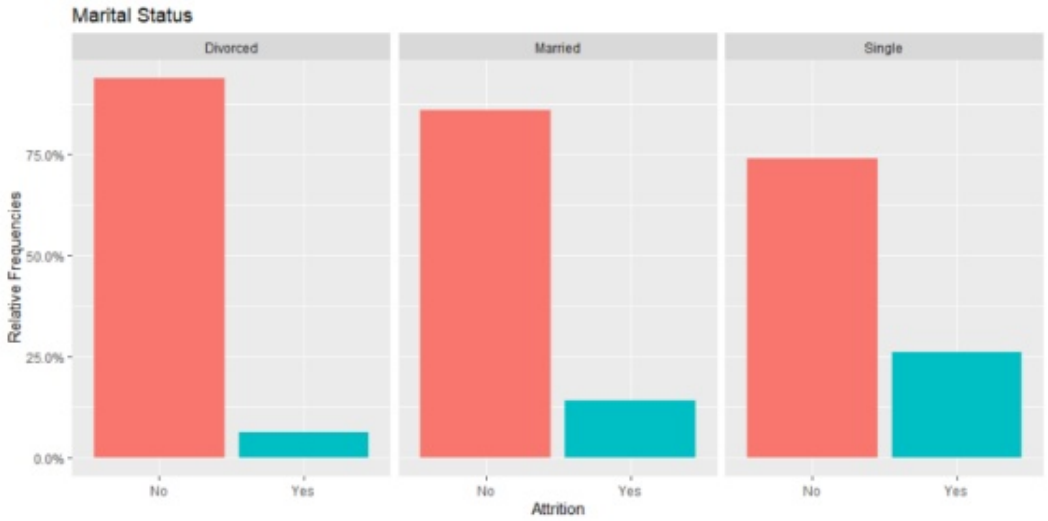
- 47% of employees who leave rate Job Involvement as a 1 or 2
- 28% of employees who stay rate Job Involvement as a 1 or 2

Marital Status

Overtime

Model Results

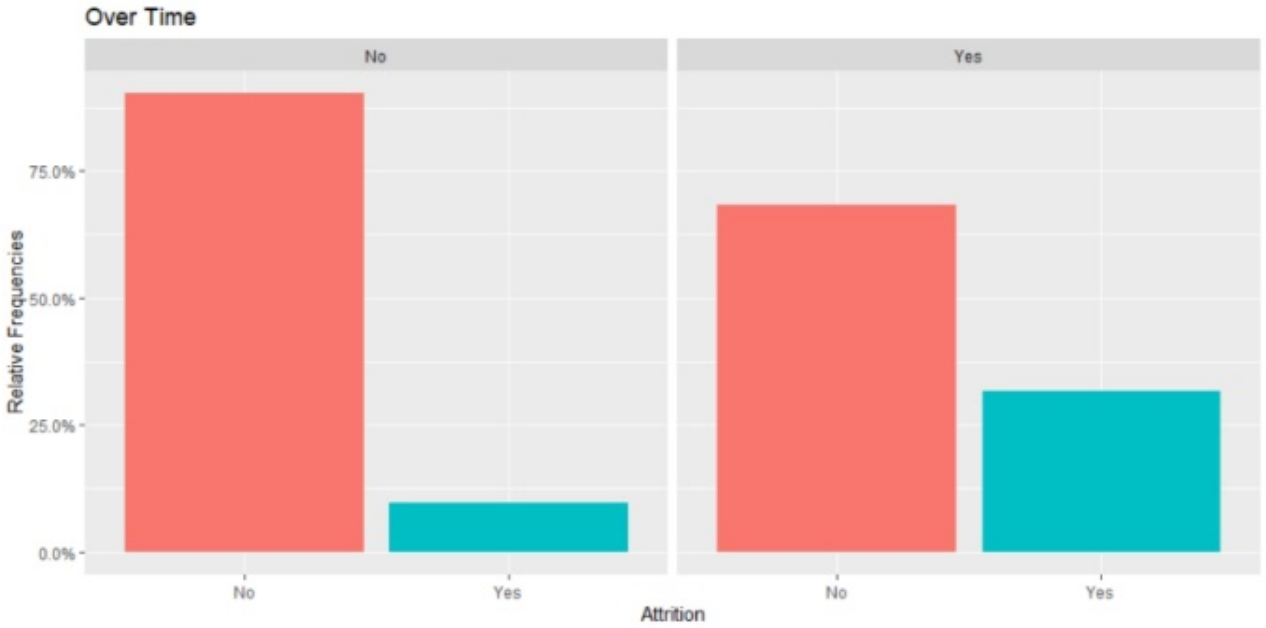
Marital Status



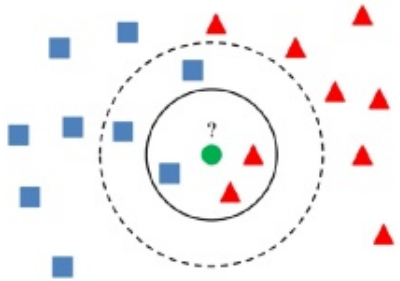
- Single employees have a 26% attrition rate
- Divorced employees have a 6% attrition rate

Overtime

- 32% of employees who work overtime leave
- 10% of employees who do not work overtime leave



kNN Model Results



- k = 3
- Variables: Job Involvement, Job Role, Marital Status, Overtime
- Accuracy: 87%
- Sensitivity: 97%
- Specificity: 32%

Image: https://www.researchgate.net/figure/K-nearest-neighbor-algorithm-illustration-The-green-circle-is-the-sample-which-is-to-be_fig14_267953942

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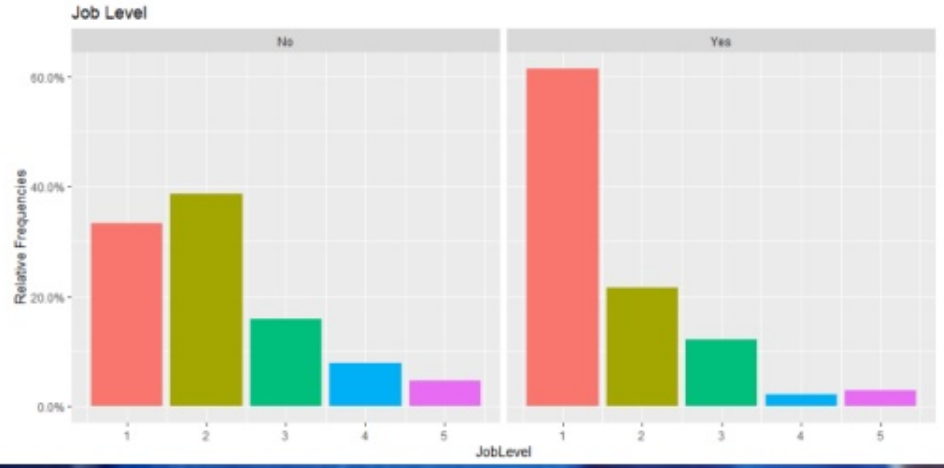
Logistic Regression Model

Variables Included:

- Age
- Business Travel
- Distance From Home
- Environment Satisfaction
- Job Involvement
- Job Level
- Job Role
- Job Satisfaction
- Marital Status
- Number of Companies Worked At
- Overtime
- Percent Salary Hike
- Performance Rating
- Relationship Satisfaction
- Total Working Years
- Work Life Balance
- Years at the Company

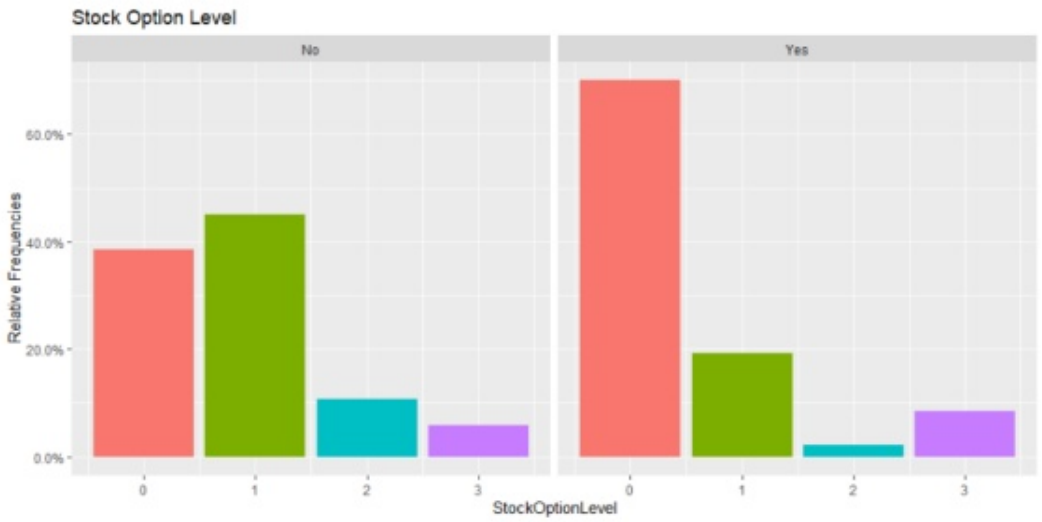


Stock Option Level

Years at the Company

Model Results

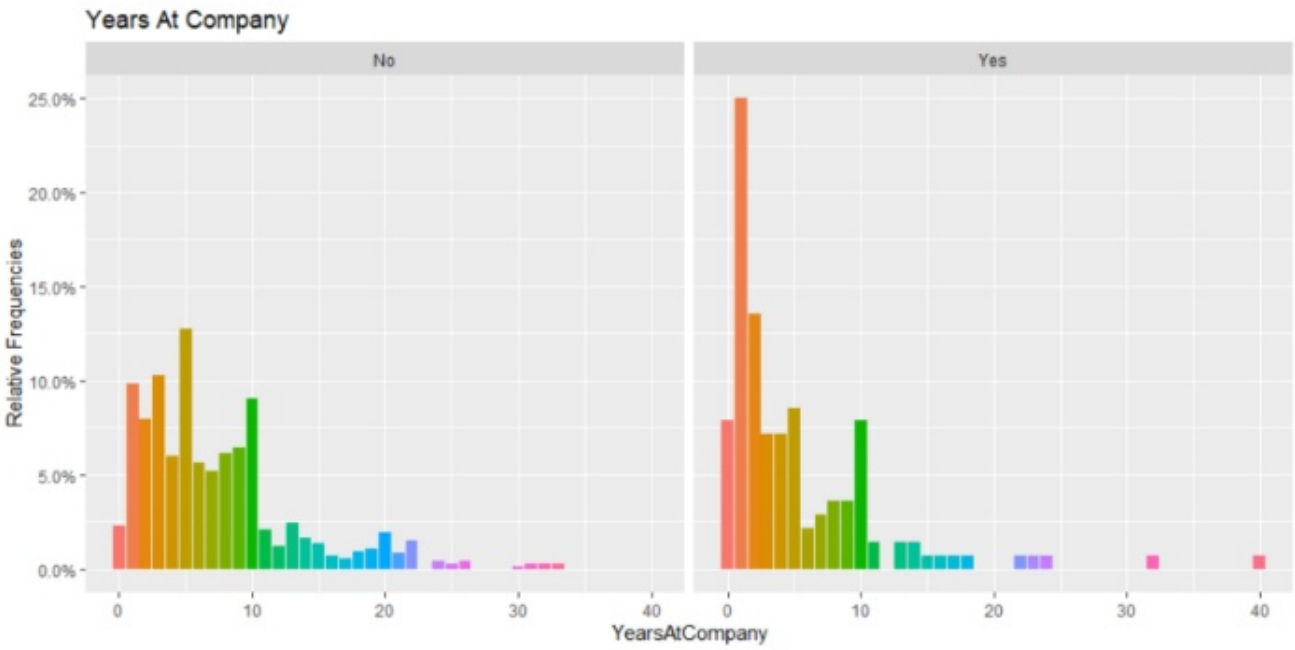
Stock Option Level



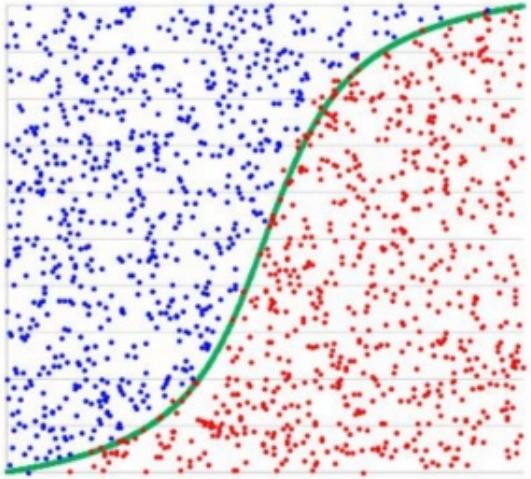
70% of employees who leave have a level 1 stock option

Years at the Company

Employees who have worked at the company 1 year have a 33% attrition rate, compared to the overall attrition rate of 20%



Logistic Regression Model Results



- Accuracy: 91%
- Sensitivity: 97%
- Specificity: 62%

Image: https://www.datasciencecentral.com/profiles/blogs/why-logistic-regression-should-be-the-last-thing-you-learn-when-b

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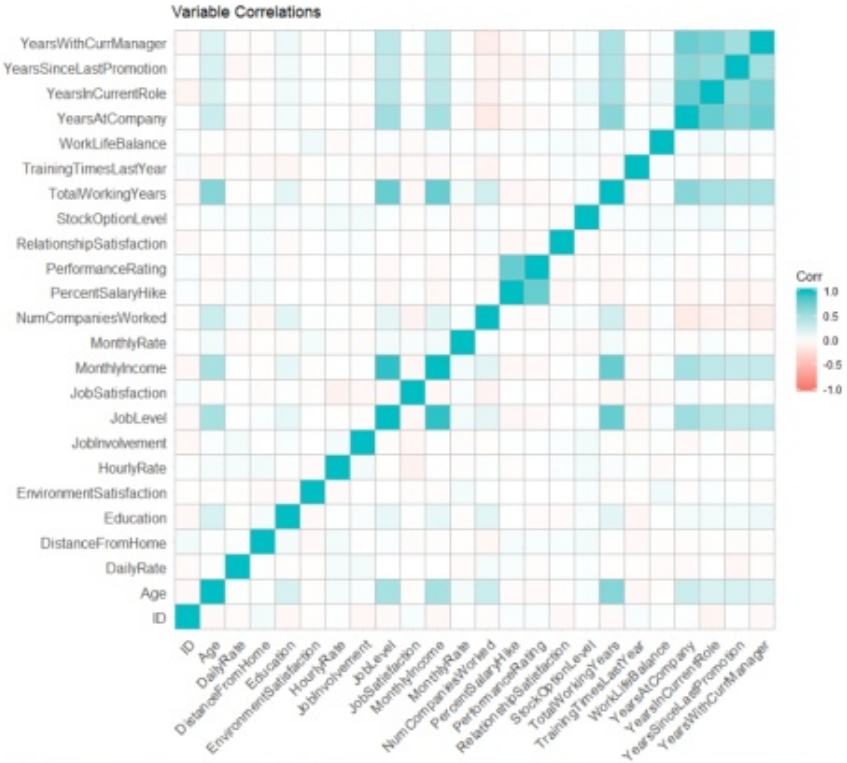
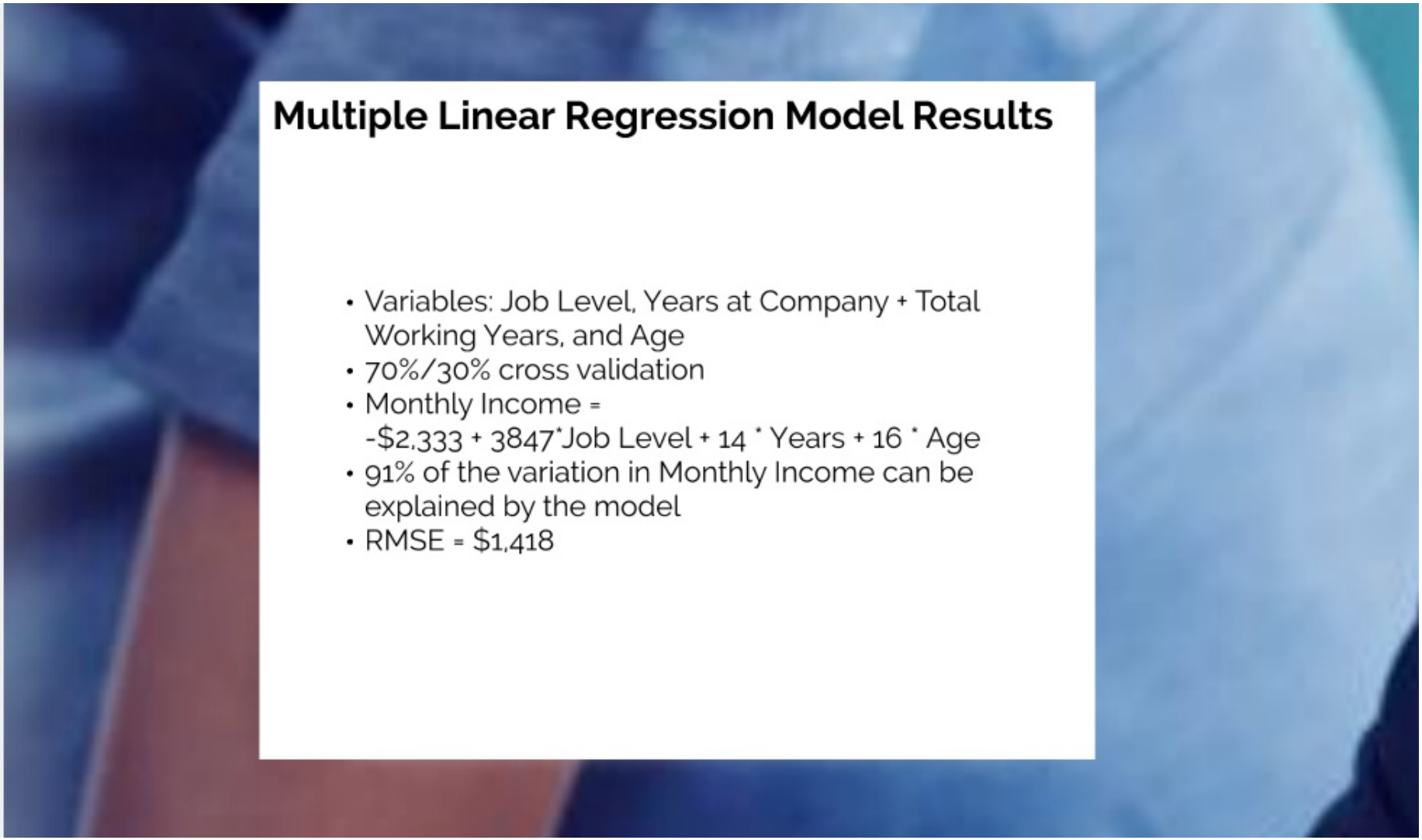
Correlation Matrix



Model Results


Multiple Linear Regression Model Results
• Variables: Job Level, Years at Company + Total Working Years, and Age
• 70%/30% cross validation
• Monthly Income = -$2,333 + 3847*Job Level + 14 * Years + 16 * Age
• 91% of the variation in Monthly Income can be explained by the model
• RMSE = $1,418

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