

# DDSAalytics Employee Attrition Analysis

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# Agenda

## An Analysis of Employee Attrition

- Understand Employee Attrition
- Predict future attrition & salaries
- Next Steps
- link to Youtube Video Youtube Video

# The Data Set

There were a total of 870 employees observed in the analysis, of which 16% were lost to attrition.

<b>Data</b>	<b>Count</b>
Attrition	1
Categorical	7
Numeric	23

# Attrition Classifier Tool

Rank	Accuracy	Model
1	97.24%	Randomforest
2	91.03%	Ensemble_vote
3	83.79%	Knn
4	82.64%	Neuralnetwork
5	81.95%	Naive_bayes

Randomforest had the best classification rate of 97.24%

## Attrition Top 6 Important Features

Rank	MeanDecreaseAccuracy	Variable
1	20.782289	OverTime
2	10.866318	MonthlyIncome
3	8.369030	StockOptionLevel
4	8.019418	JobLevel
5	8.005790	YearsAtCompany
6	7.713877	MaritalStatus

## Attrition Bottom 6 Important Features

Rank	MeanDecreaseAccuracy	Variable
25	-0.2335147	RelationshipSatisfaction
26	-0.5665574	EnvironmentSatisfaction
27	-0.7627391	TrainingTimesLastYear
28	-0.7746113	DistanceFromHome
29	-0.8593954	DailyRate
30	-2.0373400	HourlyRate

# Salary Projections Tool

Rank	Model	Root Mean-Squared Error
1	randomforest	\$670
2	ensemble mean	\$877
3	ensemble max	\$897
4	ensemble min	\$928
5	ensemble median	\$985
6	linear_regression	\$1034
7	lasso	\$1058

Randomforest had the best predictive ability with a RMSE of \$670.33

## Salary Top 6 Important Features

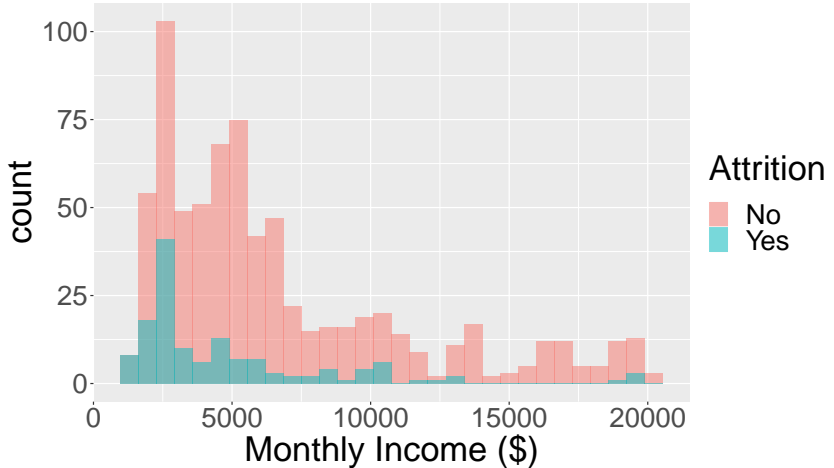
Rank	%IncMSE	Variable
1	32.667597	JobLevel
2	28.349499	JobRole
3	19.451366	TotalWorkingYears
4	11.130667	Age
5	10.101148	YearsAtCompany
6	8.071508	Department



## Salary Bottom 6 Important Features

Rank	%IncMSE	Variable
25	-0.3703881	PerformanceRating
26	-0.9053742	StockOptionLevel
27	-1.0120805	PercentSalaryHike
28	-1.3591762	MaritalStatus
29	-1.4335632	OverTime
30	-1.7421191	TrainingTimesLastYear

# Employee Salary Histogram by Attrition

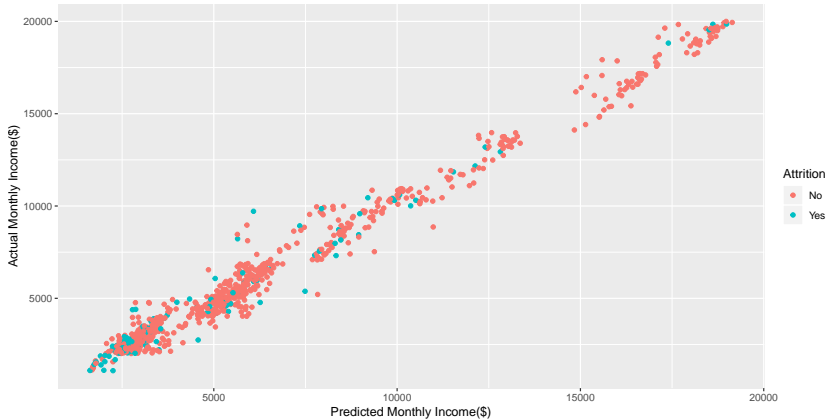


# Salary Compared by Attrition

- Employees retained had a mean salary of \$6702
- Employees lost due to attrition had a mean salary of \$4765

Attrition	Actual vs Predicted Income(\$)
No	6.60
Yes	-34.94

# Predicted Salary versus Actual Plot



# Attrition in Protected Classes



Equal Employment Opportunity Commission

# Attrition in Protected Classes

<b>Attrition</b>	<b>Over 40</b>	<b>Female</b>	<b>Average Age</b>
No	37%	41%	37.4
Yes	24%	38%	33.8

# Future Projections

Using the randomforest prediction model we predict a median salary of \$5375. This is an increase from the median observed in the historic data, which was \$4946

Using the randomforest classifier model we predict a future attrition of 1.67%. This is an increase from the attrition percentage observed in the historic data, which was 16%

# Next Steps

- 1 Pilot attrition intervention program on “at-risk” employees.
- 2 Gather more subjective or perception-based data.
- 3 Further analysis and Data Modeling.