

# Employee Turnover Analysis

## DS 6306 – Case Study 2

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**SMU**<sup>®</sup>



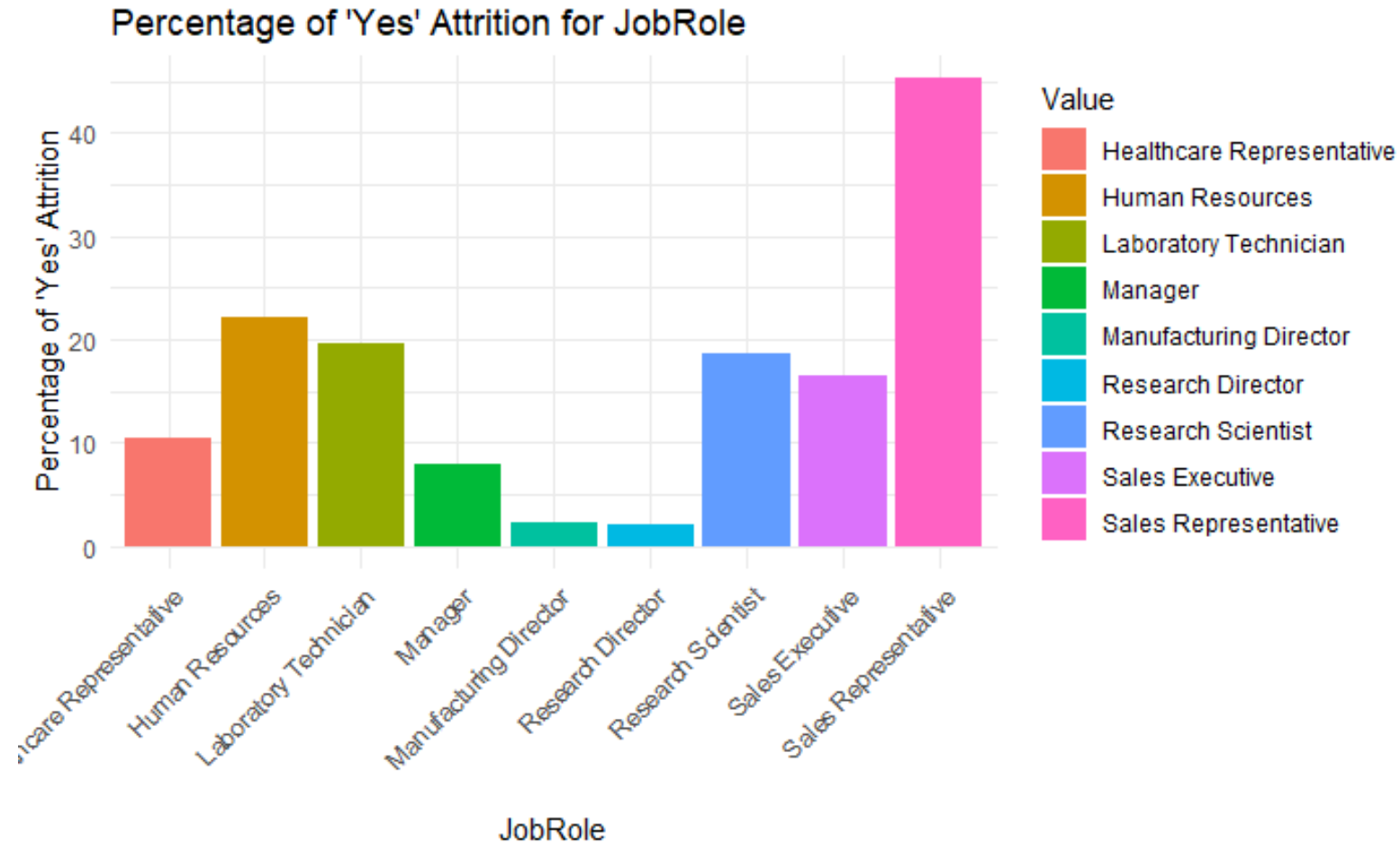


# Agenda

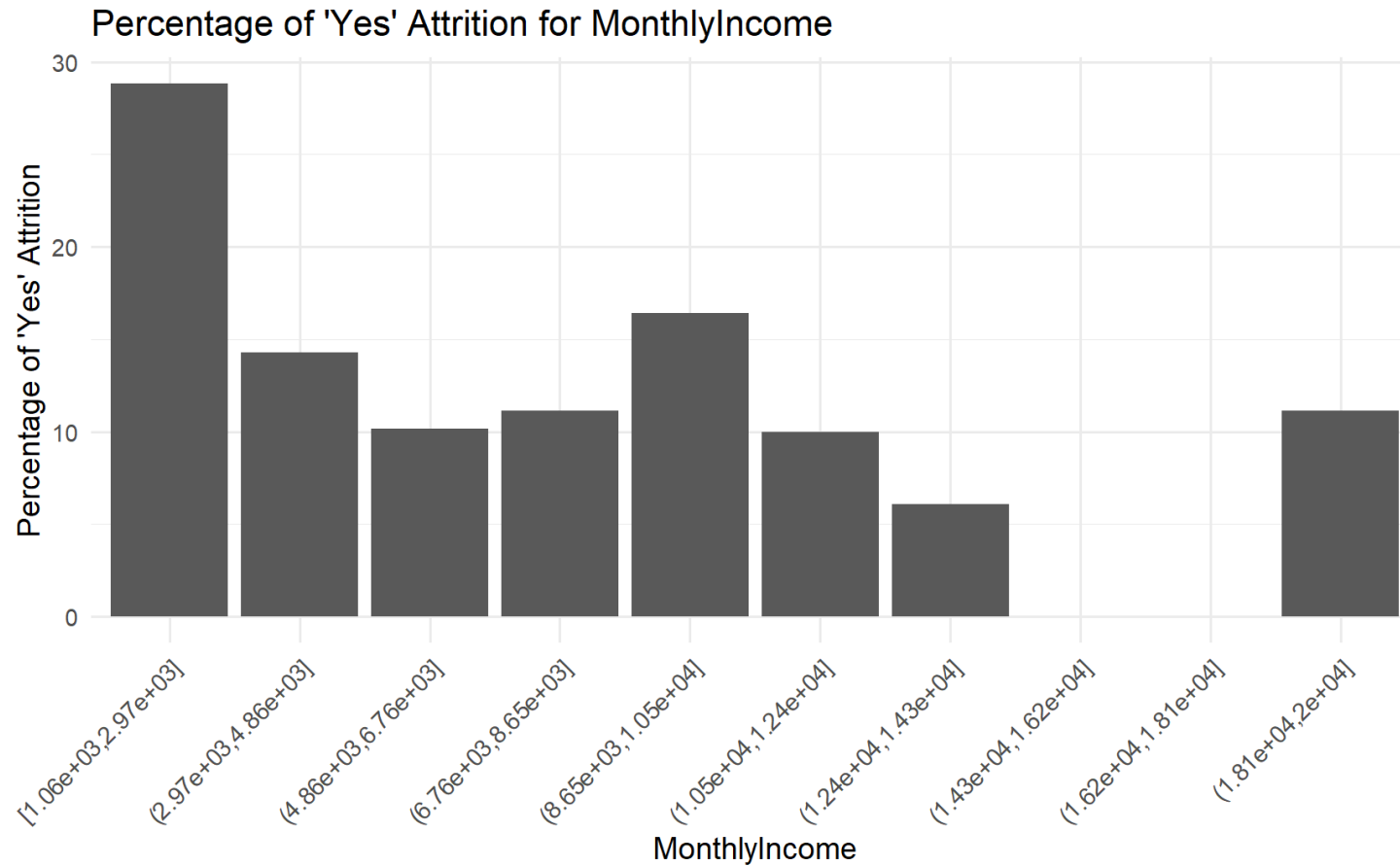
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- » Feature selection for Attrition model
  - » Results of Attrition prediction model
  - » Results of Salary prediction model
  - » RShiny App for Job Role analyses
  - » Recommendations
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- » Objective:
    - » Help DDSAnalytics identify factors that lead to Attrition
    - » Help predict salaries
    - » Provide analysis on job specific roles

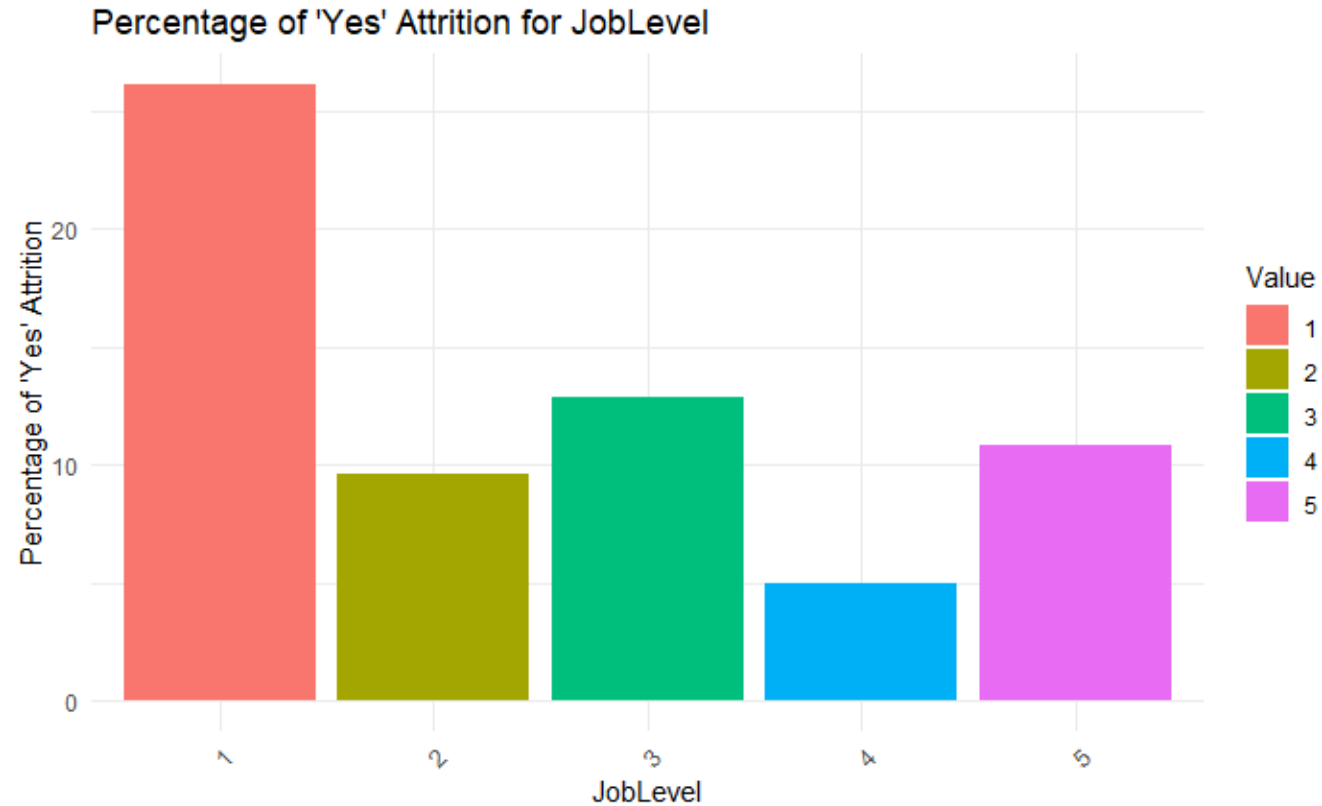
# Feature Selection – Job Role



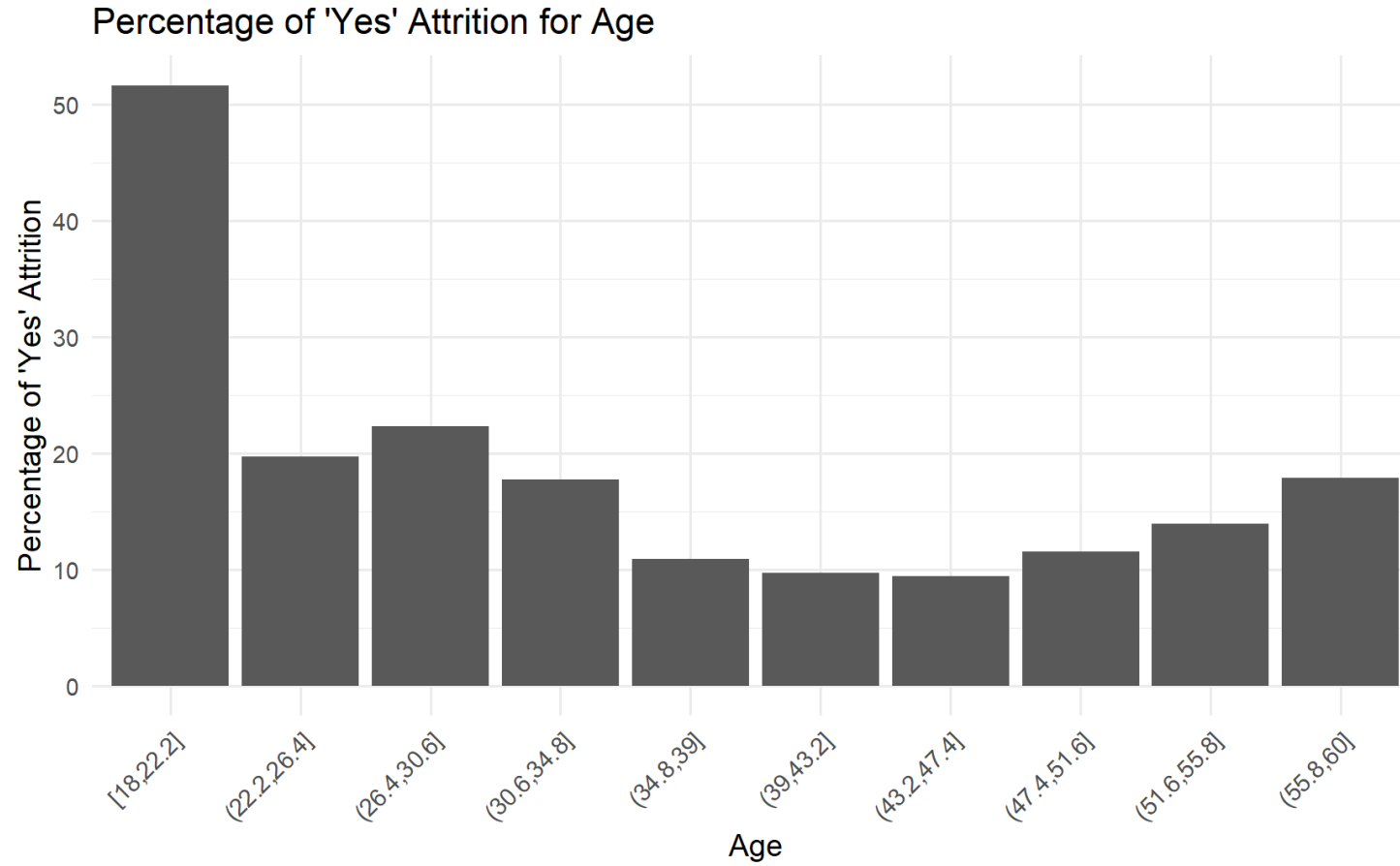
# Feature Selection – Monthly Income



# Feature Selection – Job Level



# Feature Selection - Age



# Navie Bayes Model for Attrition Prediction

		Actual	
		No	Yes
Prediction	No	109	14
	Yes	47	22

## Results

Accuracy: 68%  
Sensitivity: 70%  
Specificity: 61%

Top 3 Contributors to turnover:

1. Job Level
2. Monthly Income
3. Job Role

# Multiple Linear Regression for Salary Prediction

Build a model:  $\text{Predicted Salary}(\text{monthly income}) = \beta_0 + \beta_1(\text{JobLevel}) + \beta_2(\text{JobRole}) + \beta_3(\text{TotalWorkingYears})$

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	3605.820	214.435	16.815	< 2e-16	***
JobLevel2	1736.334	161.708	10.737	< 2e-16	***
JobLevel3	5034.593	219.136	22.975	< 2e-16	***
JobLevel4	8206.780	334.481	24.536	< 2e-16	***
JobLevel5	10948.198	385.506	28.400	< 2e-16	***
JobRoleHuman Resources	-1065.847	311.088	-3.426	0.000654	***
JobRoleLaboratory Technician	-1134.148	207.066	-5.477	6.38e-08	***
JobRoleManager	3436.956	277.700	12.376	< 2e-16	***
JobRoleManufacturing Director	123.326	191.784	0.643	0.520440	
JobRoleResearch Director	3536.068	242.902	14.558	< 2e-16	***
JobRoleResearch Scientist	-944.382	212.452	-4.445	1.05e-05	***
JobRoleSales Executive	-38.370	166.604	-0.230	0.817933	
JobRoleSales Representative	-1259.096	257.718	-4.886	1.33e-06	***
TotalWorkingYears	42.733	9.255	4.617	4.77e-06	***

Fit a model:  $\text{Predicted Salary}(\text{monthly income}) = 3605.82 + 10948.198 + 3436.956 + 42.733(12) = 18,563.77$



## Analysis on Job Specific Roles

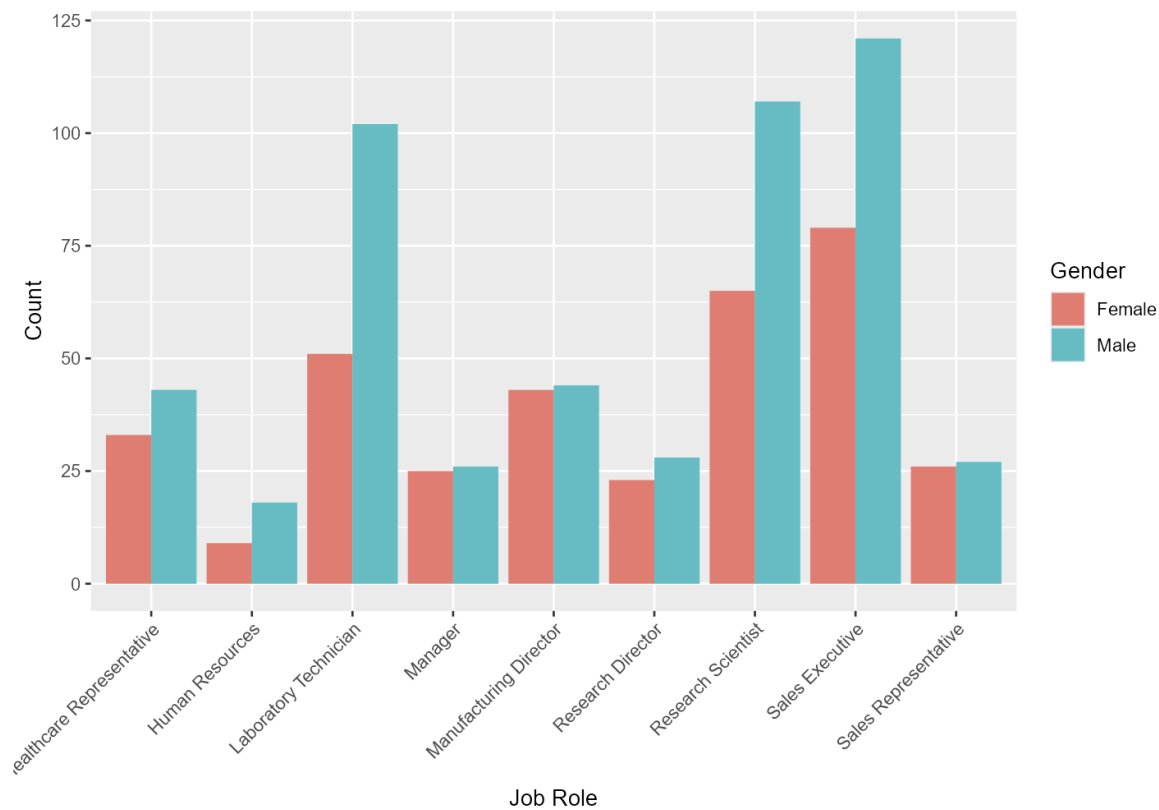
Select Analysis Type:

Gender analysis

Gender analysis

Income vs Working years analysis

Job satisfaction analysis



Link for app: <http://127.0.0.1:3336/>

# Recommendations

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## » Higher rate of turnover for:

- » Sales representative
- » Lower-level employees
- » Younger employees
- » Employees who make less money

» Recommendations: Focus on early career individuals and make it a point to talk about how they can grow and develop within their career at your company.

# Thank You!



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