

# Teladoc Health Employee Attrition Data Analysis

Analytics Showdown

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# Confidential Data Handling in Presentation

## Notice:

Due to the confidential nature of the data provided by Teladoc Health company, all charts and related descriptions within this presentation have been masked to ensure compliance with Teladoc Health's data protection policies. The masking process involves obscuring specific data points, values, and potentially identifiable information to prevent unauthorized access to sensitive company information.

# Attrition

- People analytics aims to understand employees and their needs in order to reduce attrition
- Attrition: departure of employees from a company
  - Proven to cost companies billions of dollars each year
  - Costs **one-half to two times** the worker's annual salary

# Research Question

- What are the most important reason that make employees stay or leave the company?
- How to prevent current employees from leaving their positions?
- The presentation will cover 3 parts:
  - Exploratory Data Analysis and Data Visualization
  - Predictive Modeling
  - Key conclusions and recommendations



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# 01

## Data Analysis

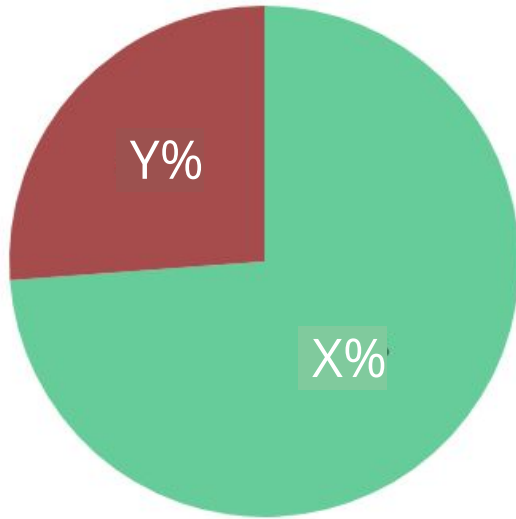
Factors that impact employee stay or leave



# Data Cleaning

- Rename/remove columns
- Assign proper data types
- Binary encoding
- Ordinal encoding
- One hot encoding
- Impute NaNs with relevant values

# Employee Attrition



- Employees currently working at Teledoc
- Employees who left Teledoc

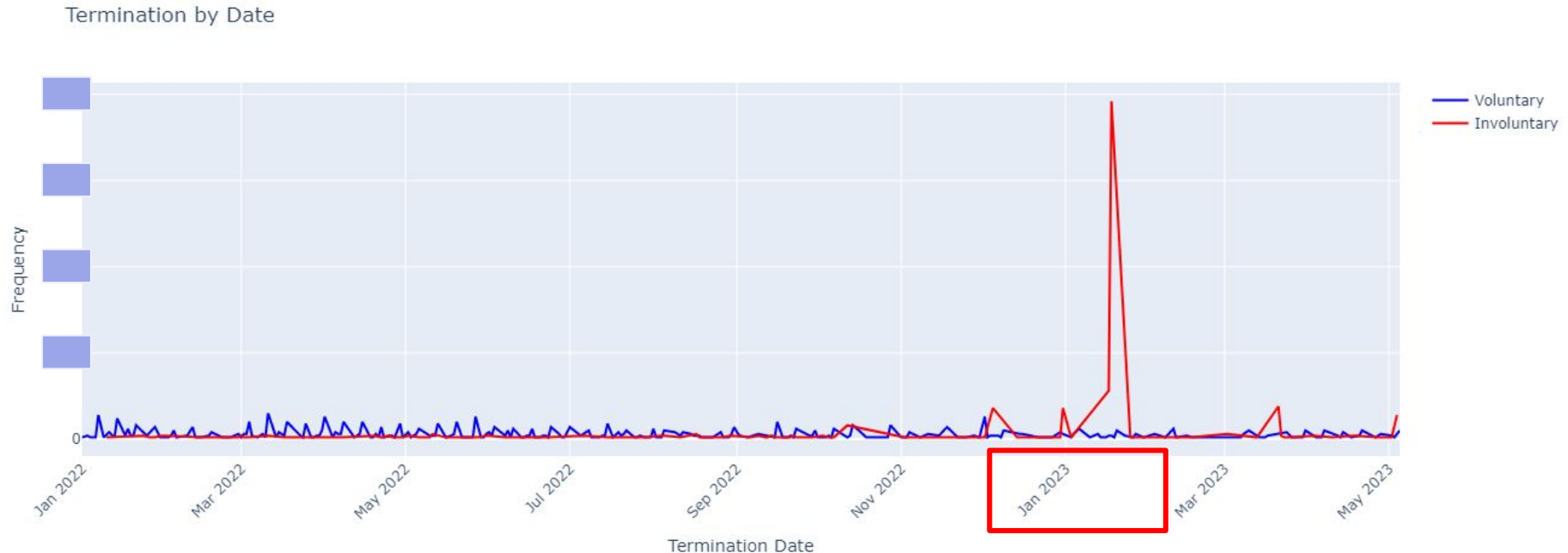
- According to the pie chart, there are X% of employees currently work at Teledoc Health and Y% of employees who left the company.



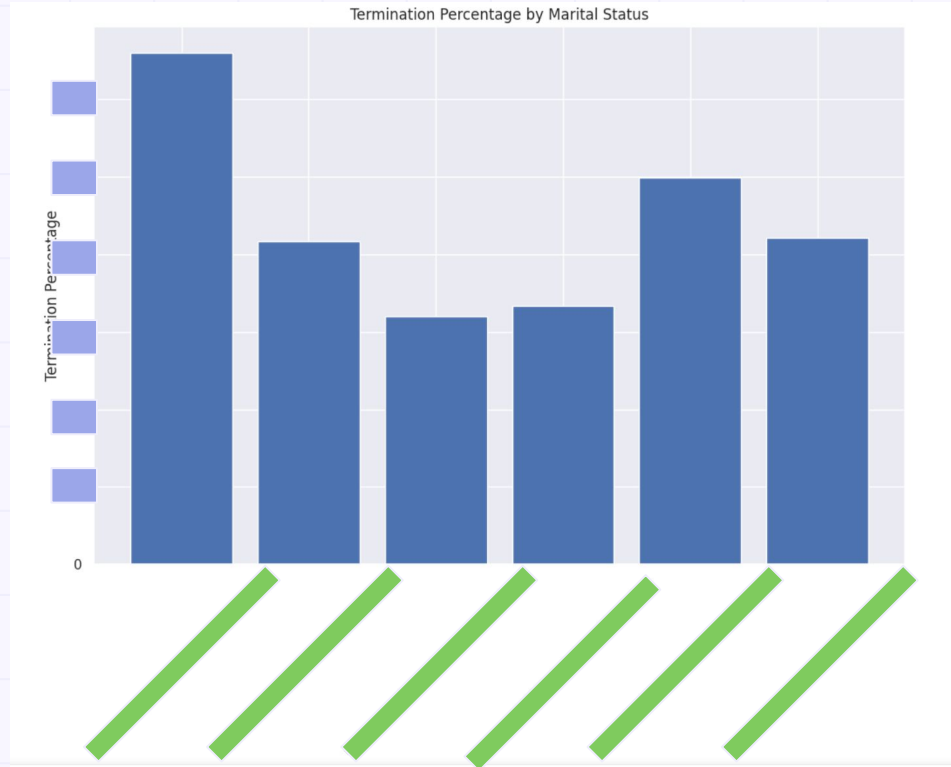
# Termination by Date

Source: [Teladoc Health layoff news](#)

- From this time series chart, we can clearly see a peak in the number of involuntary terminations from mid-January to February 2023, coinciding with the period of extensive layoffs in the tech industry.

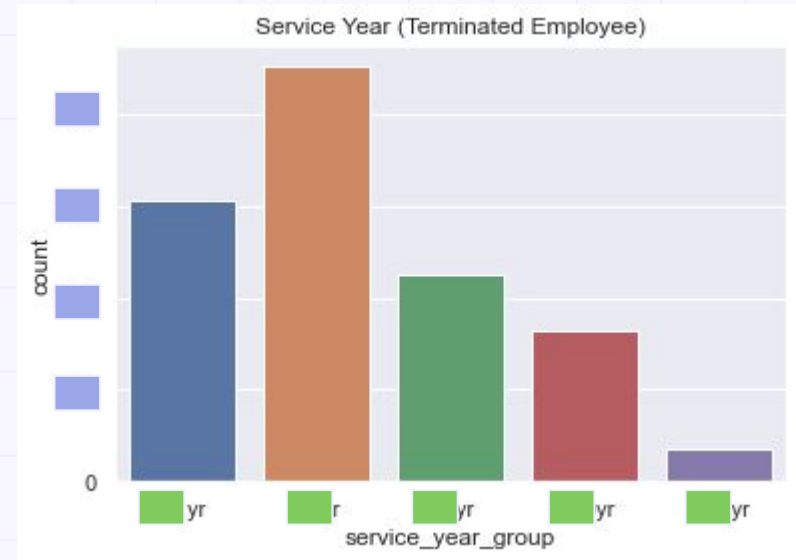
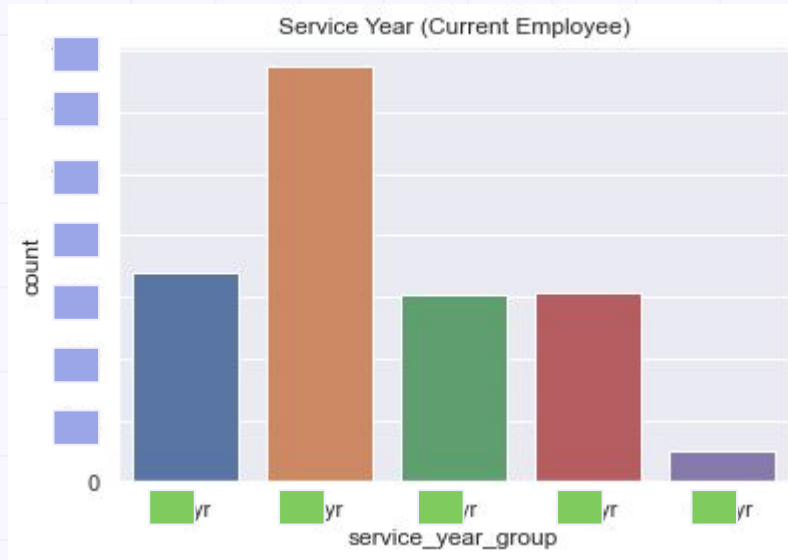


# Termination by Marital Status



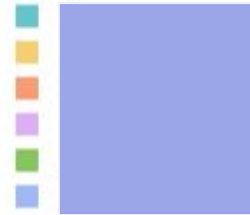
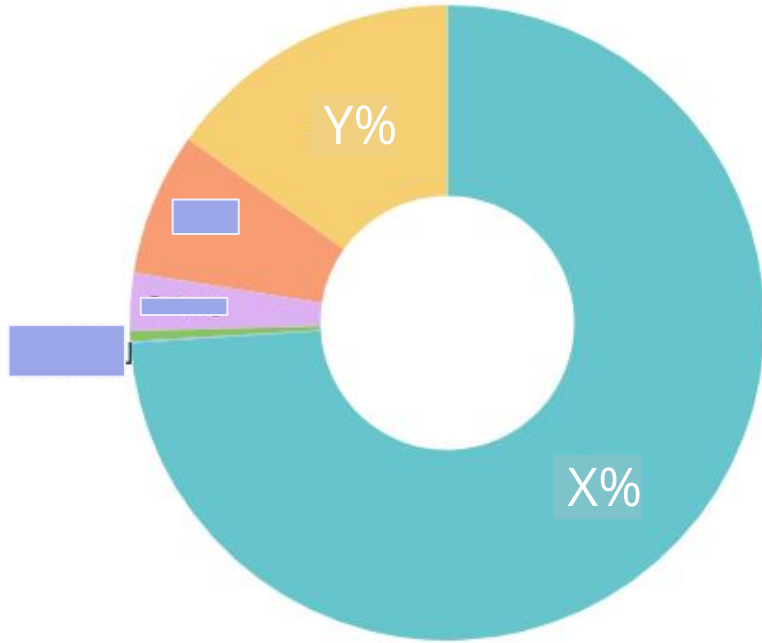
- A employees had the highest attrition rate which accounts for X%.
- B employees had the second highest attrition in the company with Y% attrition rate.
- C and D employees had the least attrition rate compare to other groups.

# 1. Years of Service



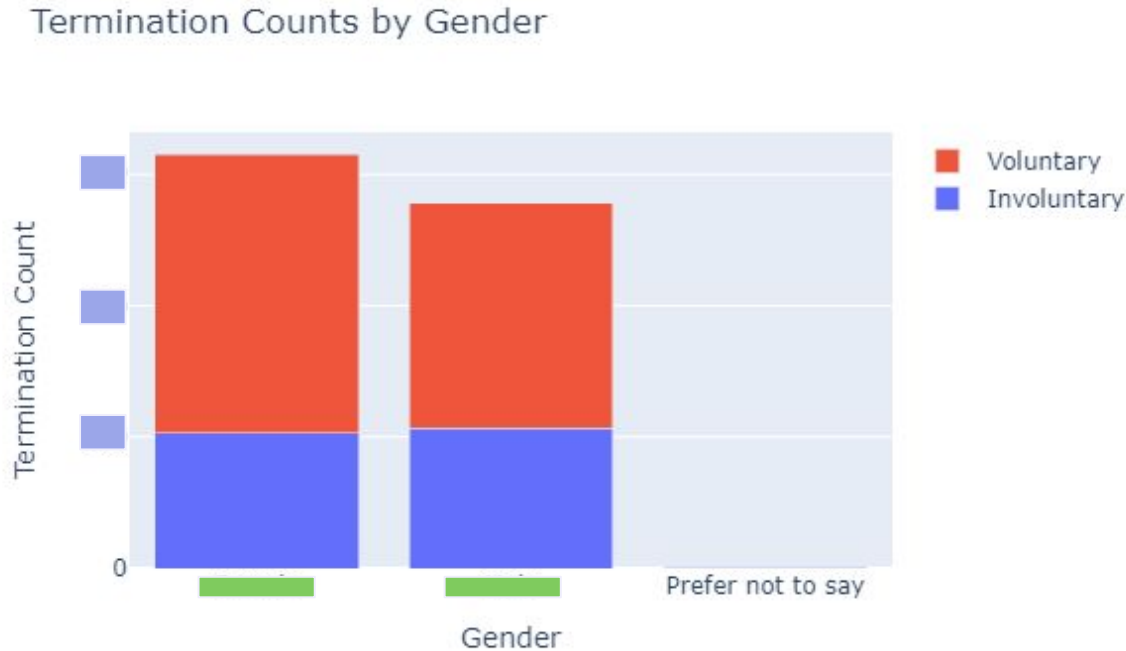
- People who worked for A to B years and less than A year are more likely to leave.

## 2. Termination Counts by Companies



- X% of the terminated employees are from A Company.
- Y% of the terminated employees are originally from B Company.

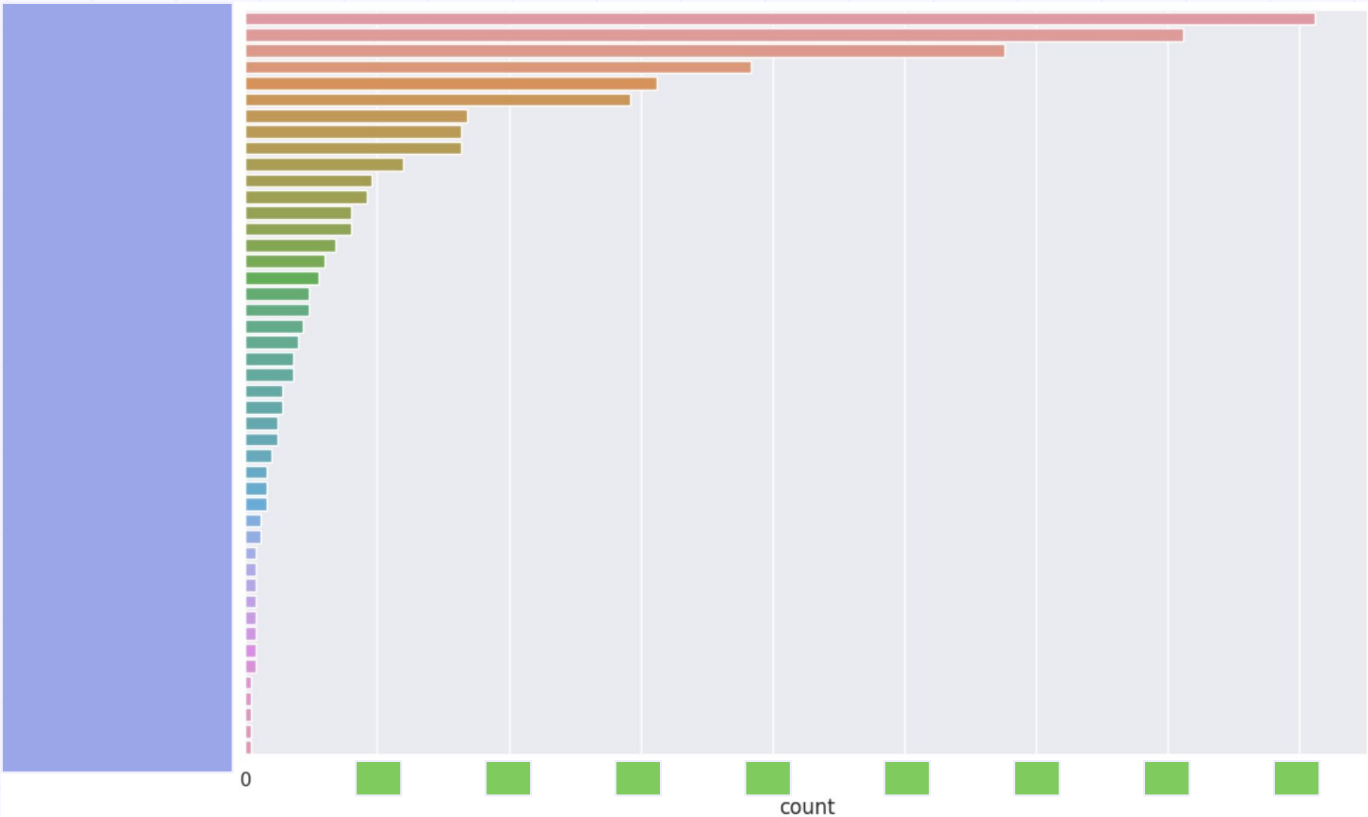
## 2. Termination Counts by Gender



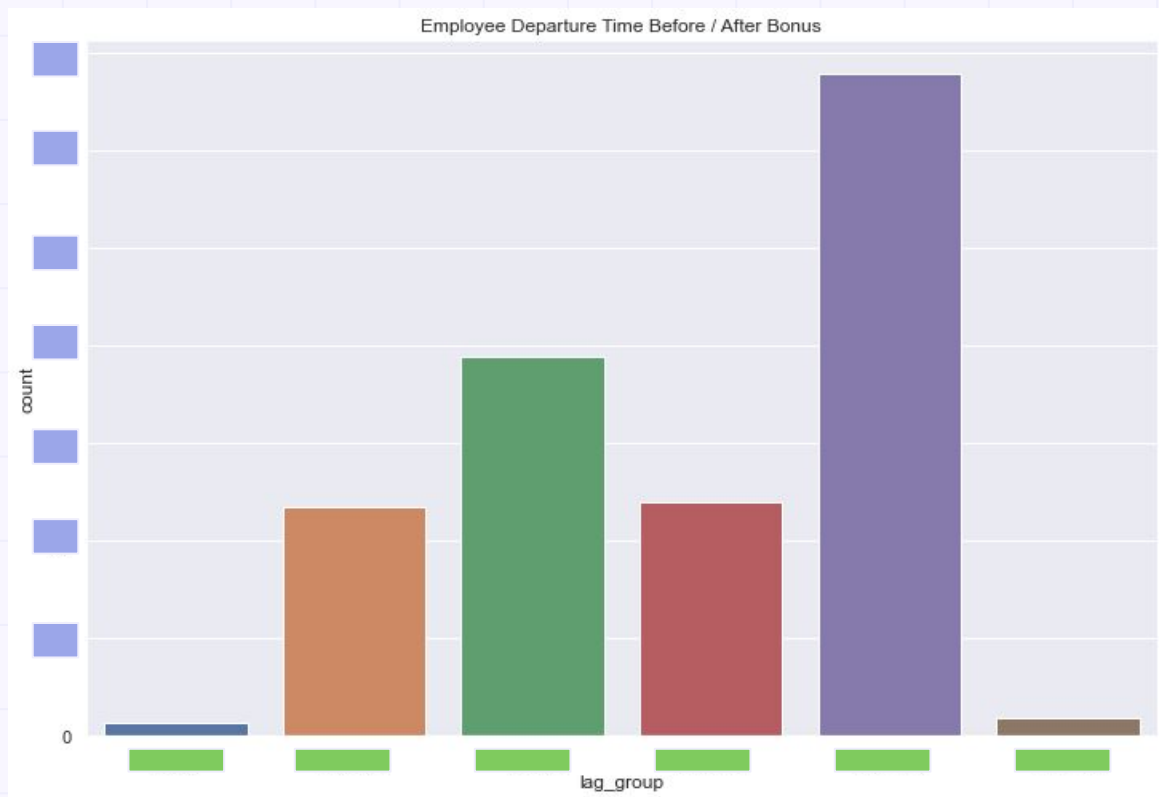
- A higher number of X employees tend to leave voluntarily.
- The Involuntary termination counts are likely equal in both genders.

### 3. Termination Counts by Department

- From the horizontal bar chart, we can clearly identify the department that experienced the highest rate of employee attrition.

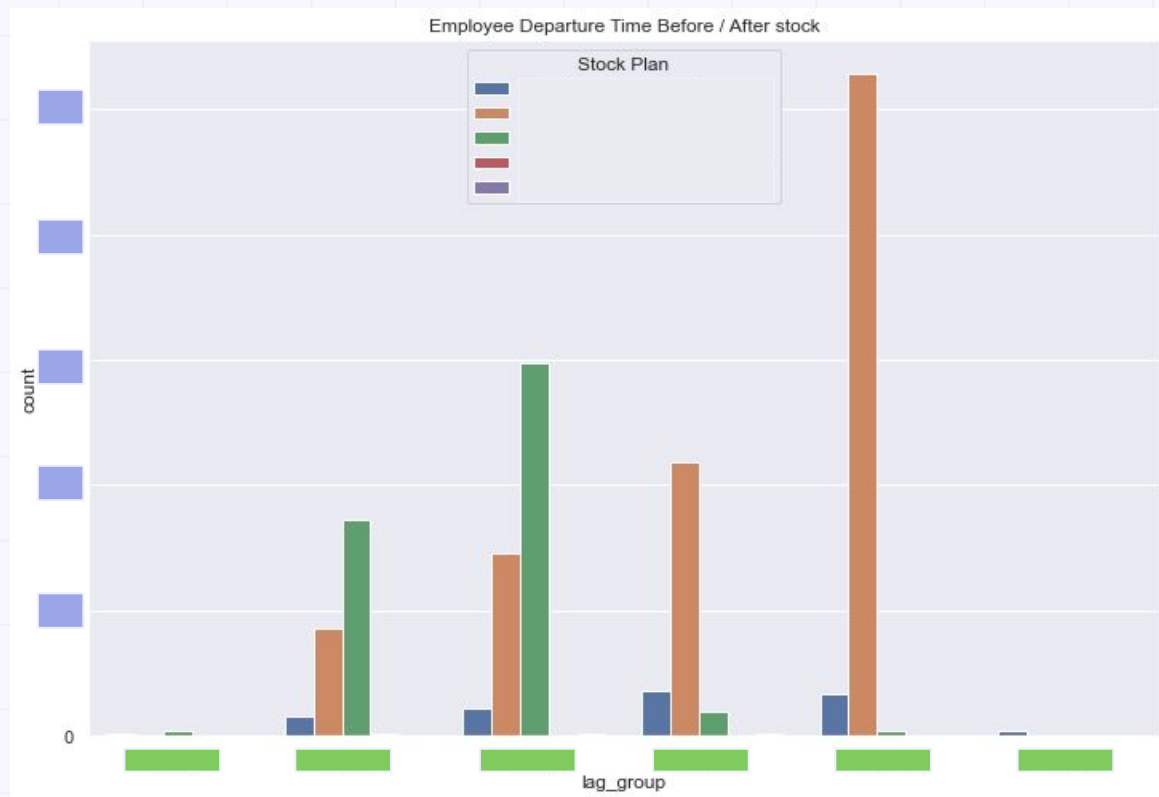


## 4. Bonus history



- People tend to stay longer if they receive the bonus.
- X% of the terminated employees stayed more than A months after receiving bonus.
- Only Y people left the company without getting any bonus.
- Giving bonus could be a good incentive to keep employees.

## 4. Equity Grants History



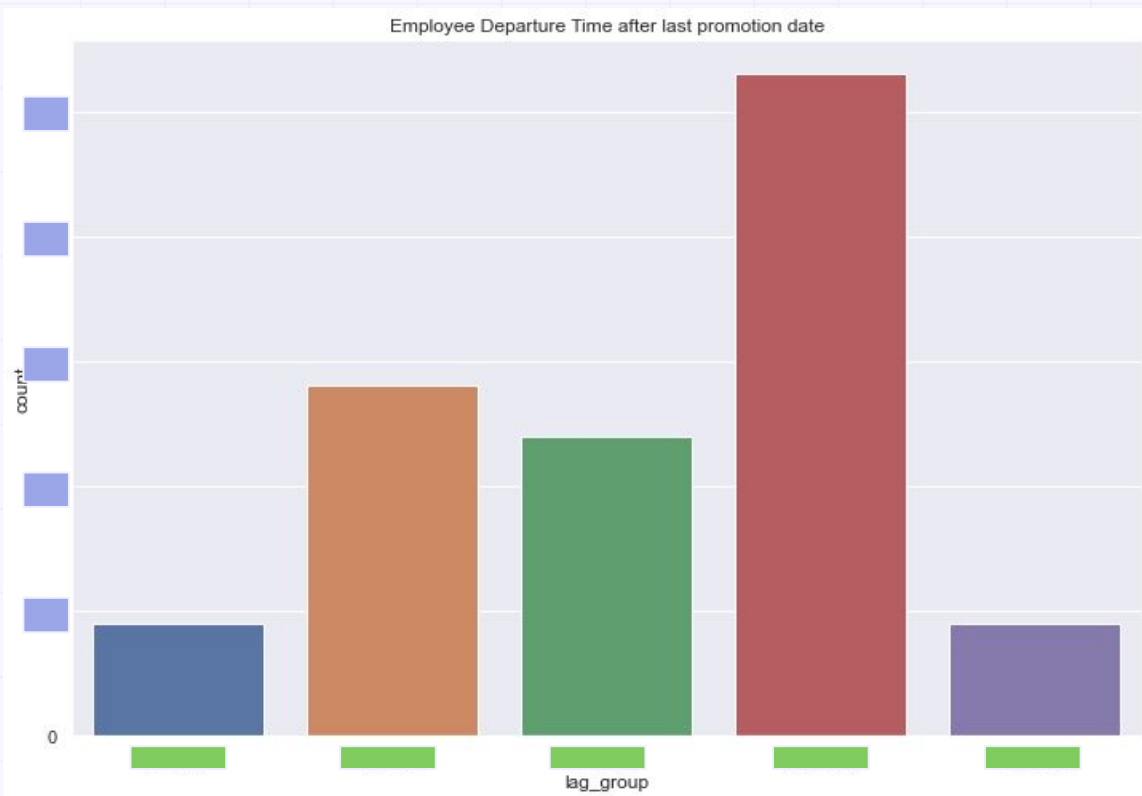
- **Stock Plan A** is the best stock plan to encourage employees staying longer.
- X% of the terminated employees stayed more than A months after receiving bonus.
- Most people who receive **Stock Plan B** would leave within B months.
- Only Y people left the company without getting any stock bonus.



## 4. Promotion History

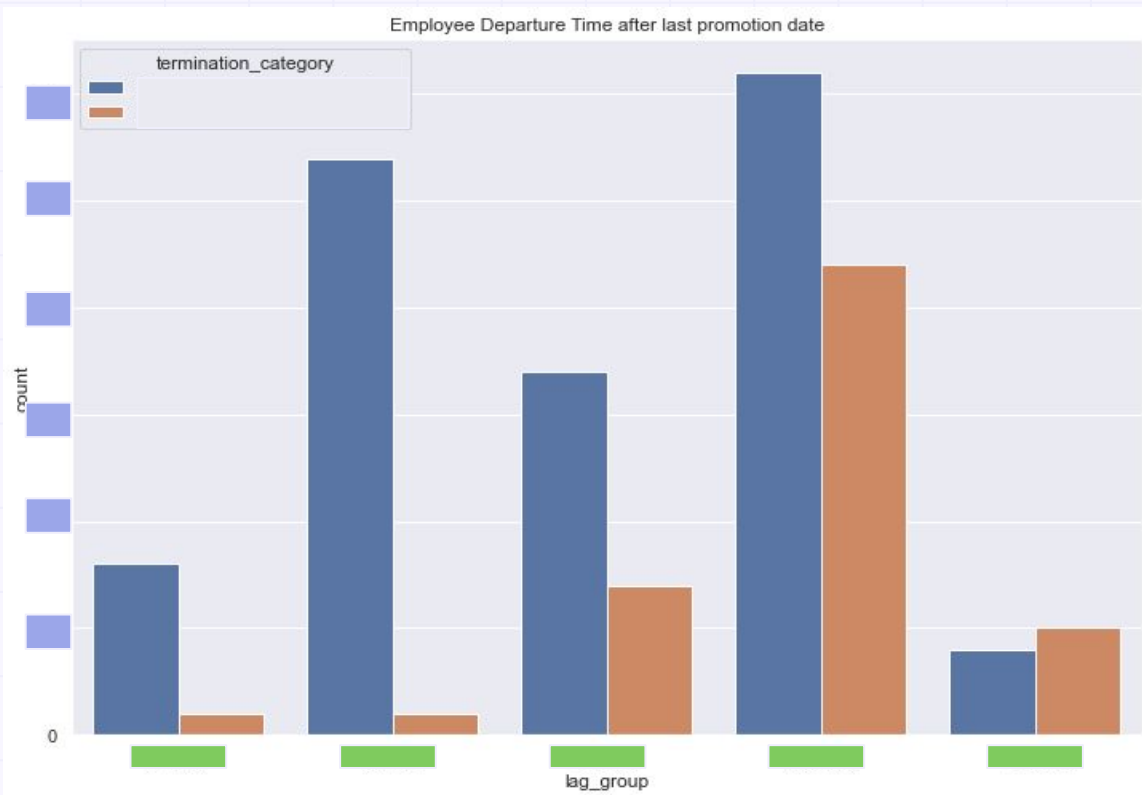
- Nearly  $X\%$  of the terminated employees have never been promoted before leaving the company. Only  $A$  people ( $(1-X)\%$ ) got promoted before.
- Nearly  $Y\%$  of the current employees never got promotion.
- Whether receiving promotion seems to be an important factor to influence an employee's decision to leave.
- Among  $B$  terminated people who never got promoted,  $Z\%$  of them quit their job voluntarily.
- Among  $C$  terminated people but got promoted before,  $W\%$  of them quit their job voluntarily.

## 4. Promotion History



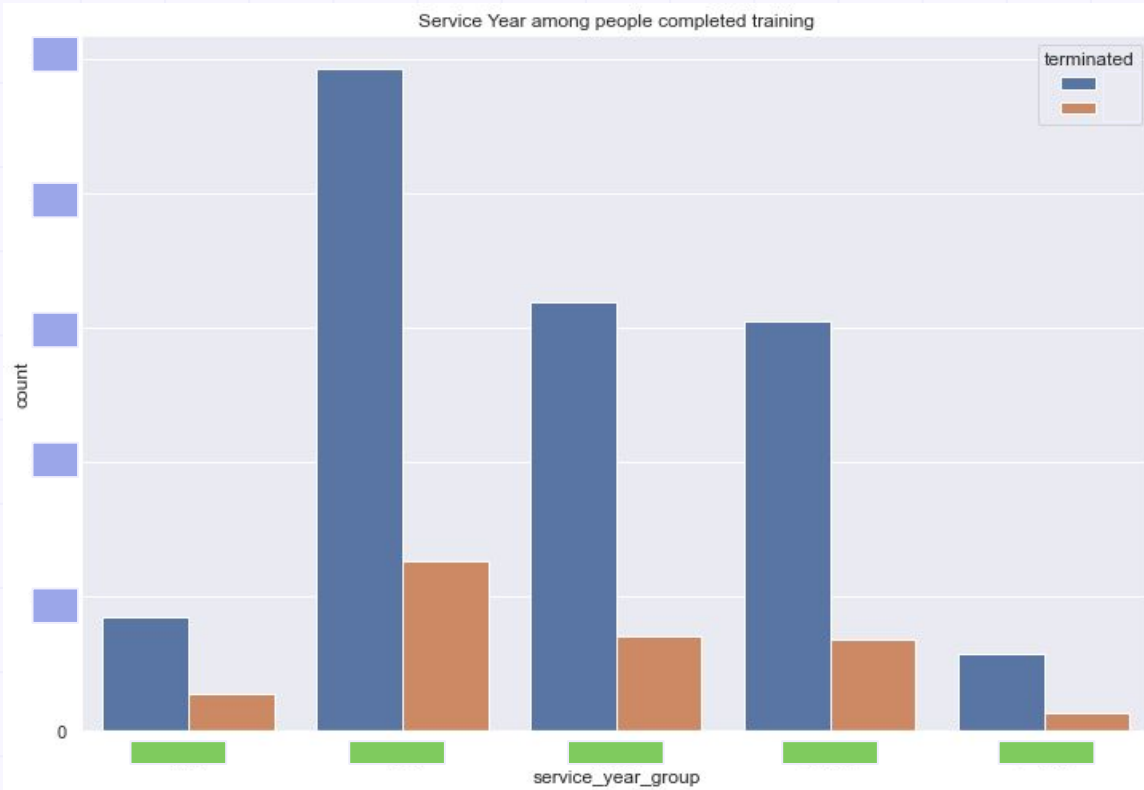
- People tend to leave if they don't get promoted for X to Y months.
- Less than A people left within Z months after getting promoted.
- Did these people end up quitting voluntarily or involuntarily ?

## 4. Promotion History



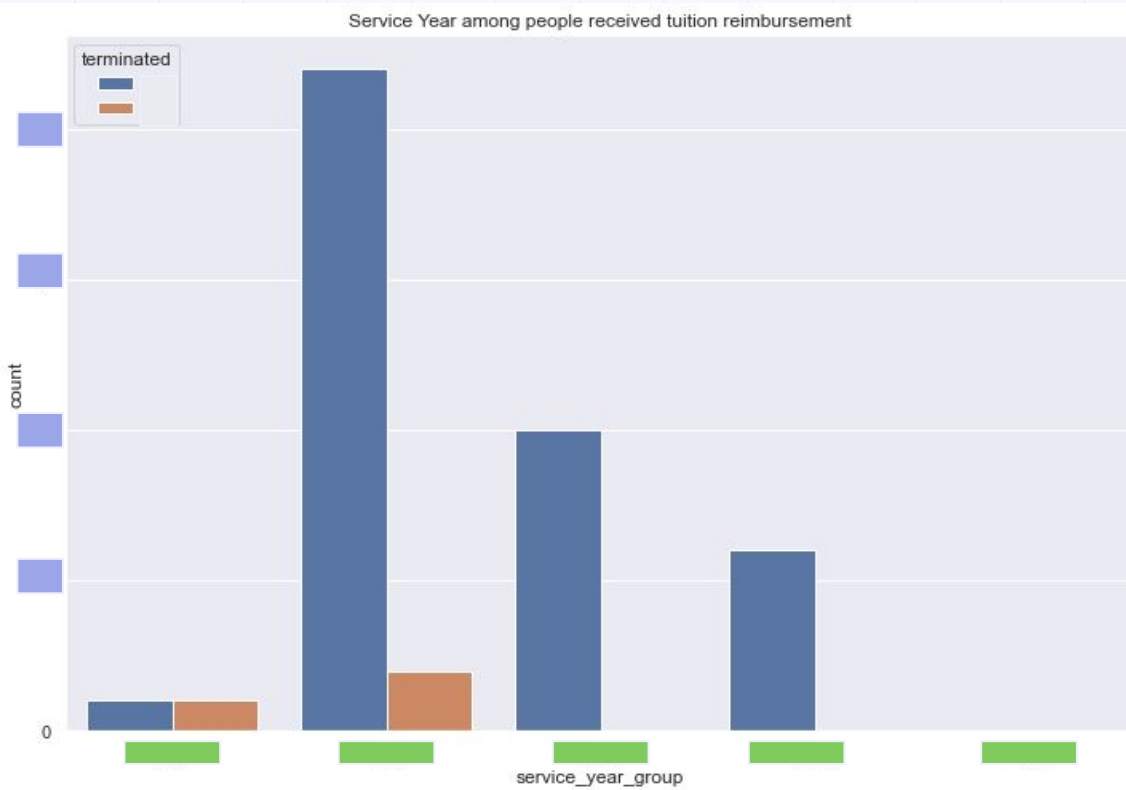
- The possibility of getting fired increases when they don't receive any promotion after X months.
- After Y months of promotion, the number of people getting fired has become larger than people who voluntarily quit the job.

# 5. Completed Training?



- There are A employees who have completed at least one training in the company.
- Among A employees, X% of them are still current employees, and Y% of them have quit.
- The ratio of current completed employees is slightly higher than current employees (Z%).

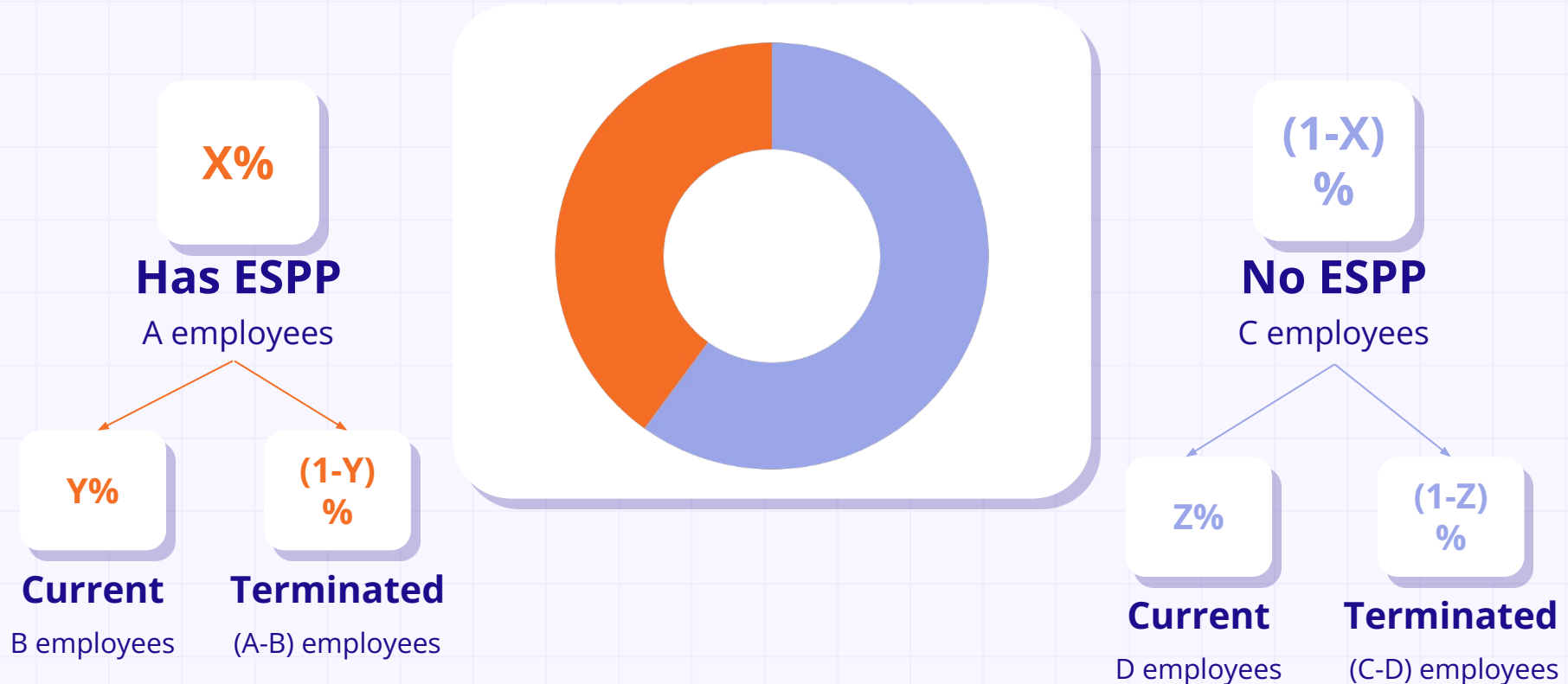
# 5. Receiving Tuition Reimbursement?



- There are A employees who at least received one tuition reimbursement.
- Only B people left their job and they all stayed less than X years.
- Providing tuition reimbursement could be a good strategy to keep employees.

## 6. Participation in ESPP

- Whether participating in ESPP **does not influence** employees' decision to stay or leave the company.



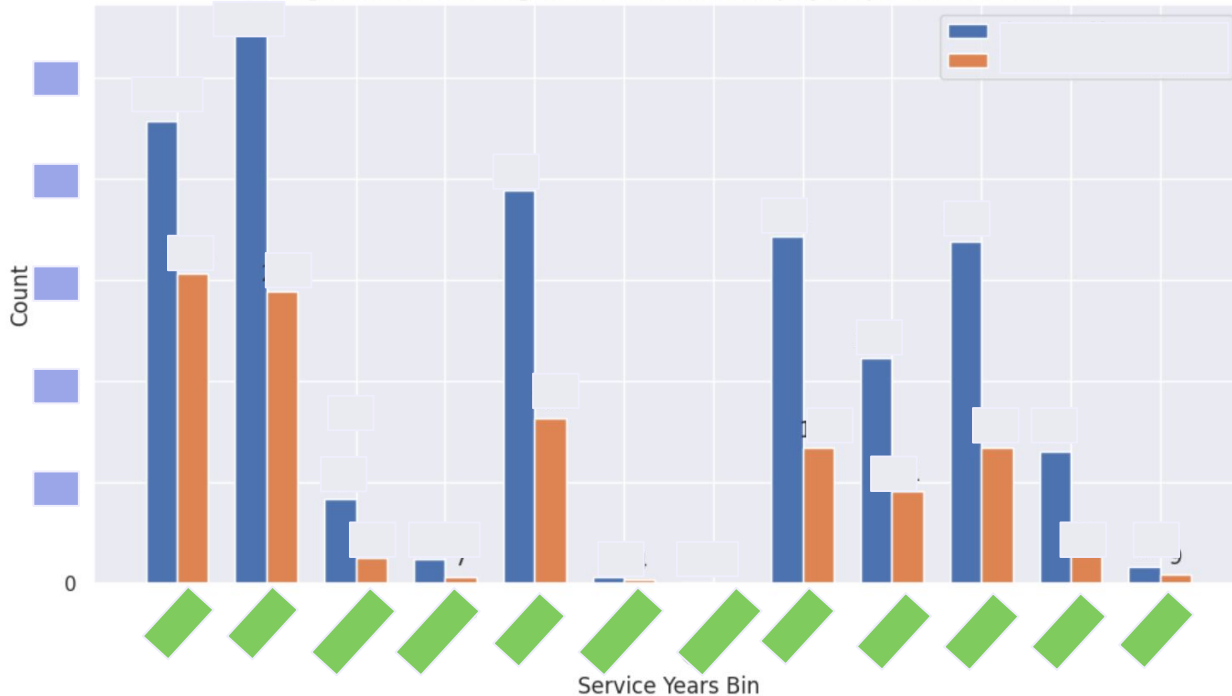
# Managers and Service Years



- The graph shows the average number of managers for employees belonging to different service year categories.
- It can be seen that most of the managers have been working in Teladoc Health for A to B years.

# Terminated Employees under Managers

Average Number of Managers and Terminated Employees per Service Years Bin



- The graph shows the average number of managers for employees belonging to different service year categories along with the number of terminated employees.



# Managers vs. Terminated Employees

[illegible]

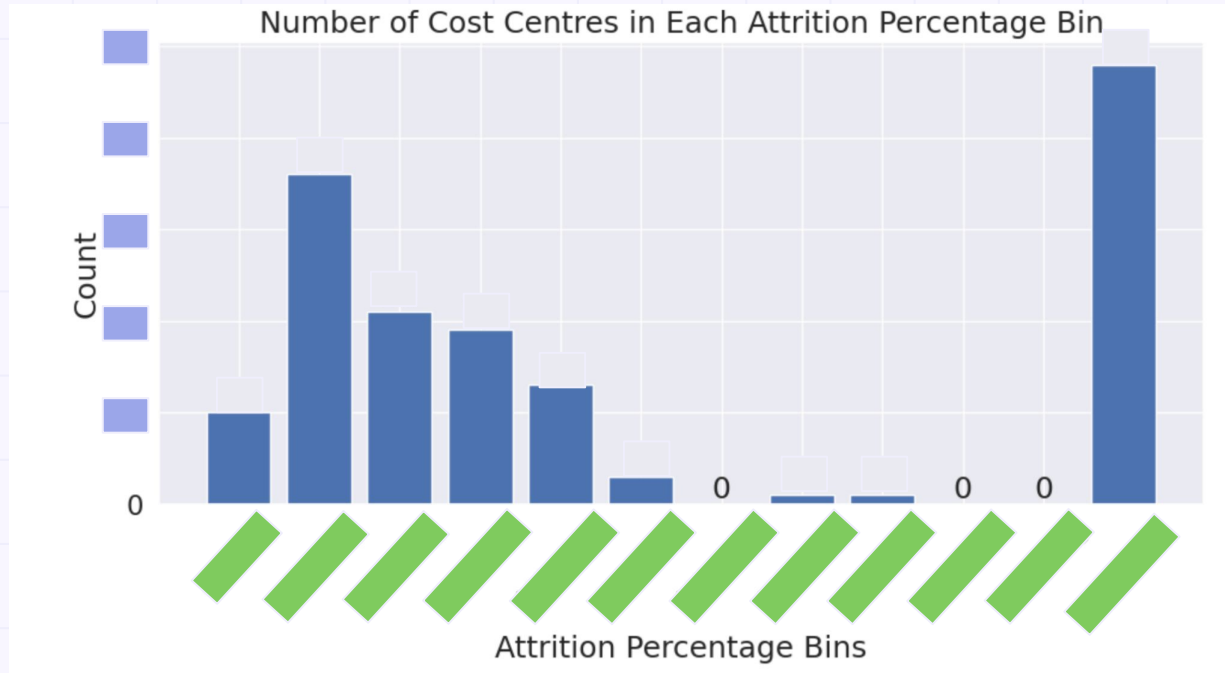
- Employees with tenure A years see the **highest manager changes**. This group also has the **highest attrition percentage**.

# Employees performance



- Terminated employees on average have (higher / lower) average performance rating from 2018-2022 (or during the tenure of the employee) across all periods of service.

# Number of Cost Centers



- A number of cost centers have X% of attrition. We speculate they may be temporary employees since the count of employees at each of these centers are between A to B.

# 02

## Predictive Modeling

Factors that impact employee stay or leave

# Building Models

After considering important factors that could potentially affect an employee's stay or leave, we developed 3 different classification models using boosting techniques.

- Model 1 - Gradient Boosting Classification Model
- Model 2 - eXtreme Gradient Boosting Classification Model (XGBoost)
- Model 3 - eXtreme Gradient Boosting Classification with hyperparameter tuning.

Choosing a model - Model 2 is chosen due to its higher accuracy, precision, recall, f1-scores and lower Mean Squared Error. (explained in the notebook)

# 03

## Key Conclusions

Insights and Suggestions



# Insights and Recommendations

- Recommendations:
  - Provide more opportunities for growth and promotions
  - Improve performance by highlighting learning and training opportunities
  - Benefits such as A, B, and C program.
- Too much movement in the company can lead to higher attrition rates, especially with younger employees
  - When an employee's "D factor" changed, the employee is more likely to depart from the company
- The best predictive model is Model 2 based on  $R^2$ , MSE, and accuracy score.

