A DATA MINING APPROACH ON ATTRITION RATE ANALYSIS OF EMPLOYEES

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PROJECT GOAL

"A GREAT EMPLOYEE IS LIKE A FOUR LEAF CLOVER, HARD TO FIND AND LUCKY TO HAVE"

- This makes employee retention a very important aspect for the growth of the organization.
- **Attrition rate** is a measure of the number of individuals or items moving out of a collective group over a specific period.
- Our goal of the project was to develop an evaluation model to determine the most important factors that influence the attrition rate of employees in an organization.

DATASET

- Used the HR Analytics dataset available in Kaggle.
- The factors that describe each employee's record are employee satisfaction level, last evaluation, number of projects, average monthly hours, time invested for the company, work accident, promotion in the last 5 years, department, salary, current employee or ex-employee

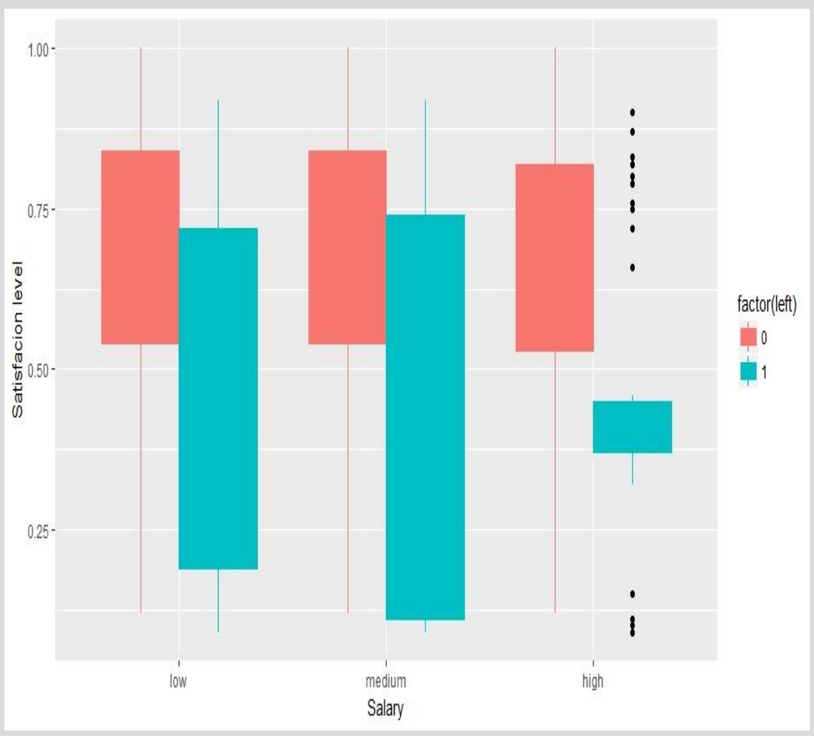
DATA PREPROCESSING

Added the following additional attributes:

- **Improper Evaluation** : Employees with last evaluation > 0.87 and salary = low , assign "YES"
- **Overrated** : Employees with satisfaction level, last evaluation and number of project less than median value, and, promoted= "yes", assign "YES"
- **Average Daily Hours** = Average Monthly Hours/22

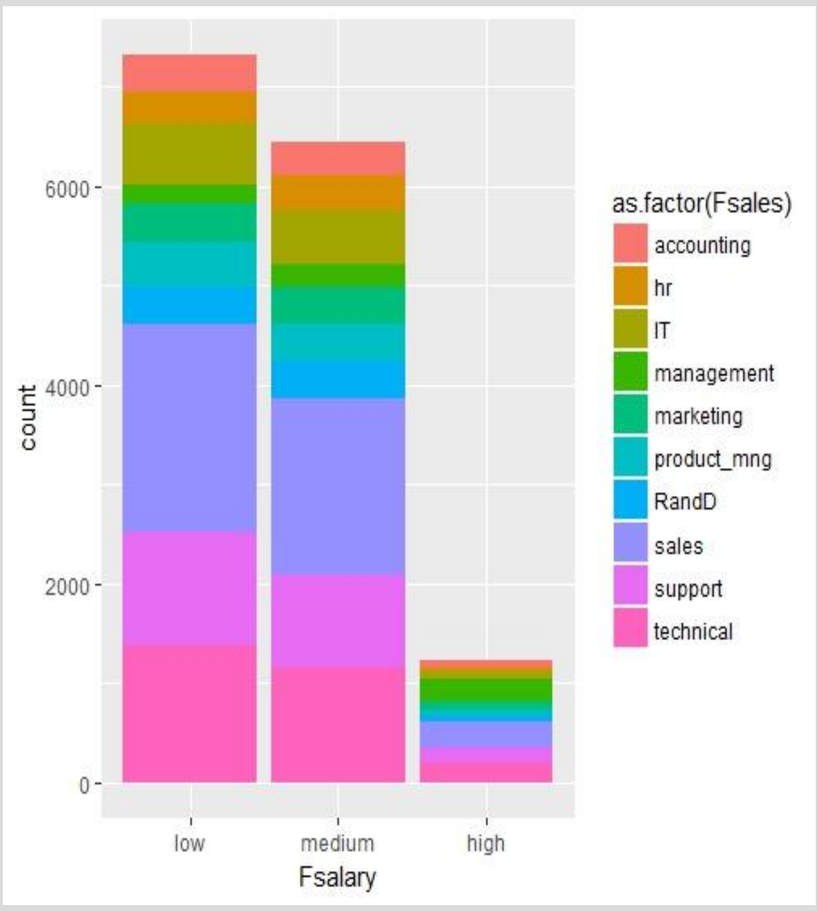
DATA EXPLORATION

- Exploration done with seaborn plots in Python and plots in R.



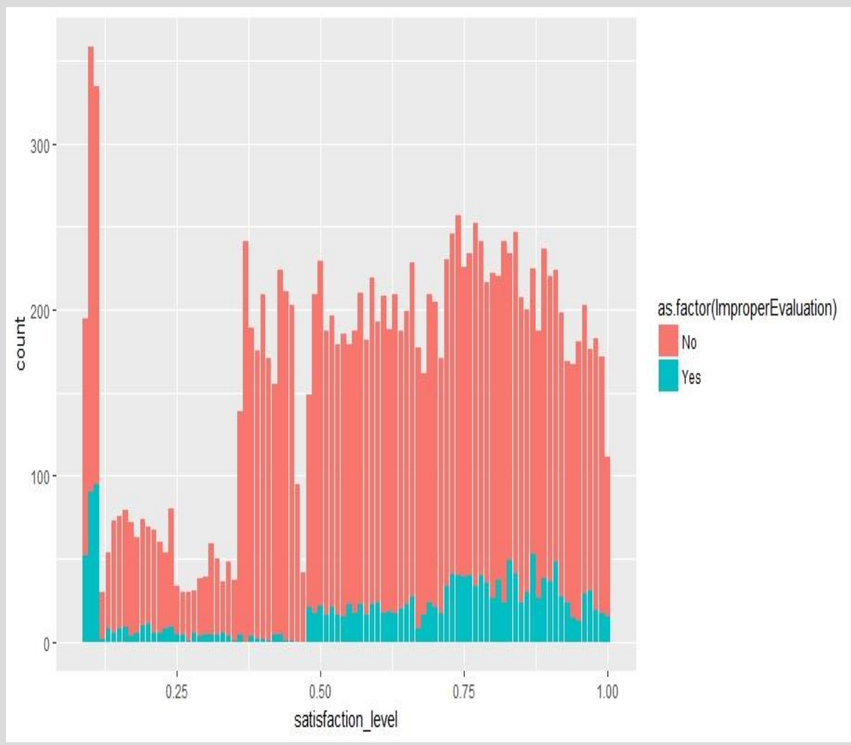
ANALYSIS

Employees leaving the company have spent more years with salary levels "low " and "medium"



ANALYSIS

The sales department has majority of employees falling under salary levels "low" and "medium" category.

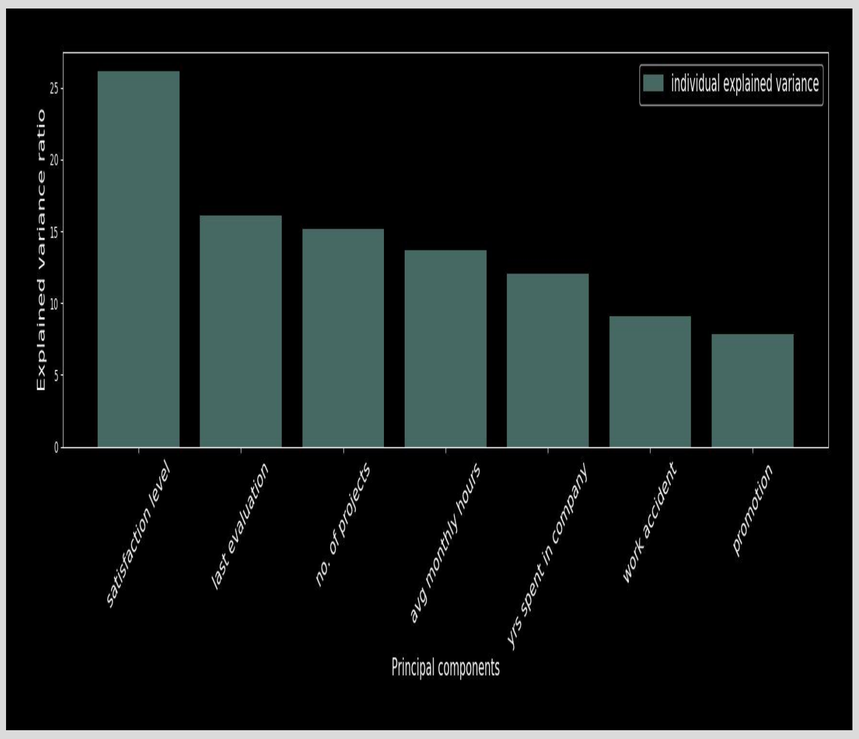


ANALYSIS

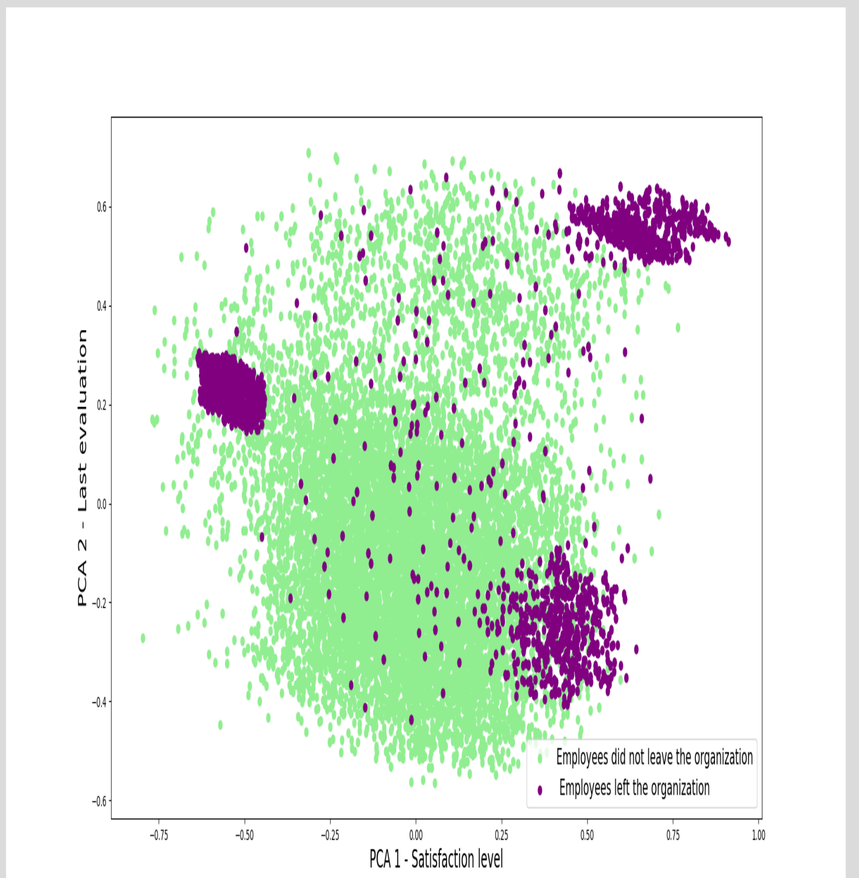
Employees with higher "satisfaction level" are evaluated incorrectly.

PRINCIPAL COMPONENT ANALYSIS (2-COMPONENTS PCA)

- It is a dimensionality reduction technique that reduces the existing set of variables into a smaller set.
- The reduced set will still contain the most important attributes (with maximum variance) required to determine the attrition rate

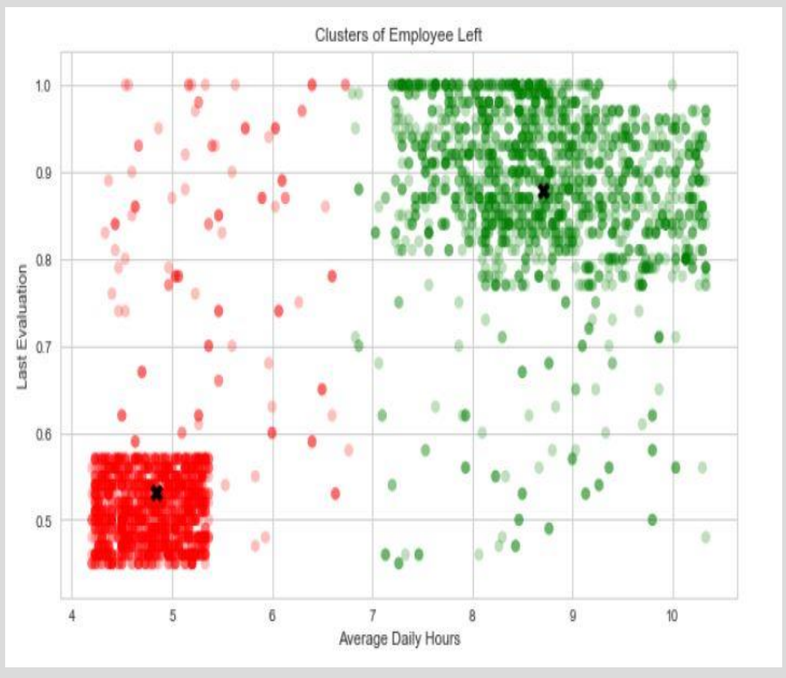


2-COMPONENT PCA



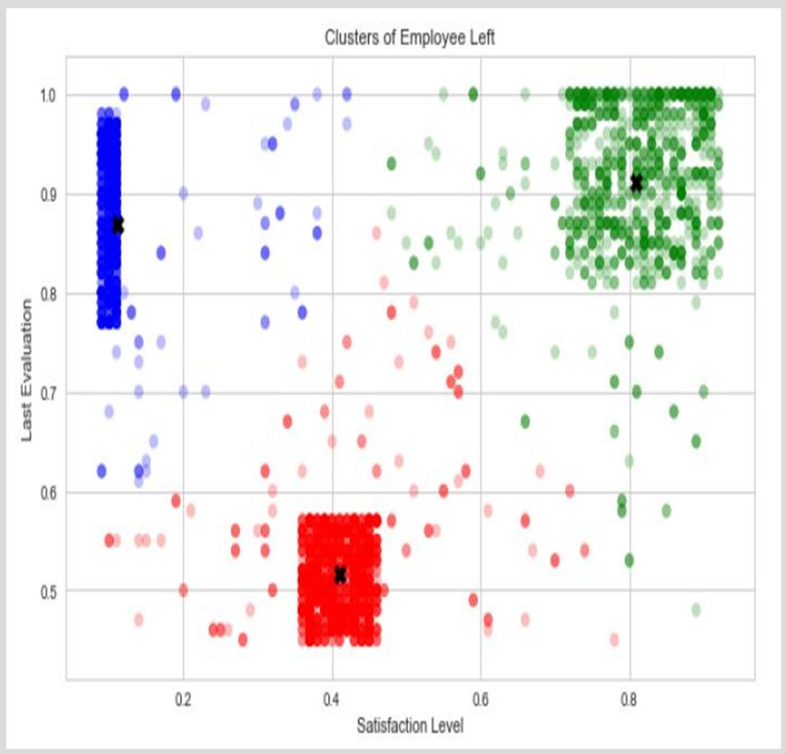
K-MEANS CLUSTERING

Clustering is an interesting technique that helps find natural and inherent structures amongst the objects.
We implemented assignment based clustering (k-means) on attributes with continuous values.
The cluster graphs were plotted for employees who left the organization based on attributes obtained from PCA.



ANALYSIS

Employees with high "average daily hours" and high "last evaluation" , "low" average daily hours and "low" evaluation tend to leave the organization.

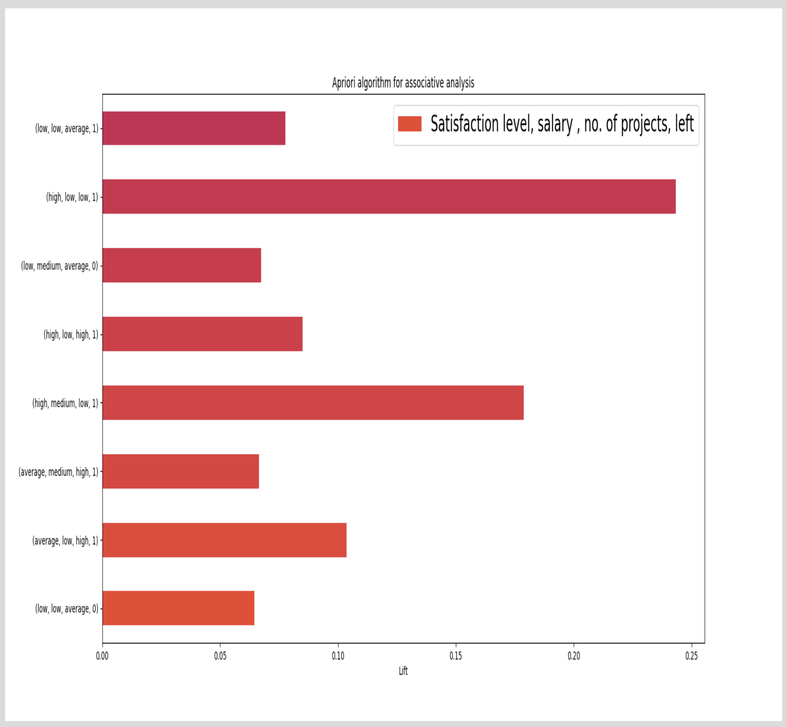


ANALYSIS

Employees with "average" satisfaction level and low "last evaluation" , "low" satisfaction level and "high" last evaluation, "high" satisfaction level and "high" last evaluation tend to leave the organization.

ASSOCIATIVE ANALYSIS (USING APRIORI ALGORITHM)

- Association Analysis is a technique for uncovering the interesting relations between the variables.
- We used Apriori algorithm with minimum support and confidence to determine the associativity between attributes (not clusterable attributes) and employees who left the organization.



CONCLUSION

- The major factors that are responsible to evaluate the employees attrition rate are **satisfaction level, last evaluation, number of projects, salary** and **average daily hours.**
- The result obtained above would help an organization make positive changes and deliver better experiences to meet the employee's expectations.
- This will ultimately reduce the attrition rate of the employees