Employee Promotion Prediction

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Employee Promotion Prediction

Data Details:

- Data Set Consists of 54808 Entries with 14 Features

Null Values:

- Education: 2409
- Previous Year Rating: 4124

Categorical Variables:

- Department
- Region
- Education
- Gender
- Recruitment Channel

Numerical Variables:

- No. of Trainings
- Age
- Previous Year Rating
- Length of Service
- KPI met >80
- Awards Won
- Average Training Score

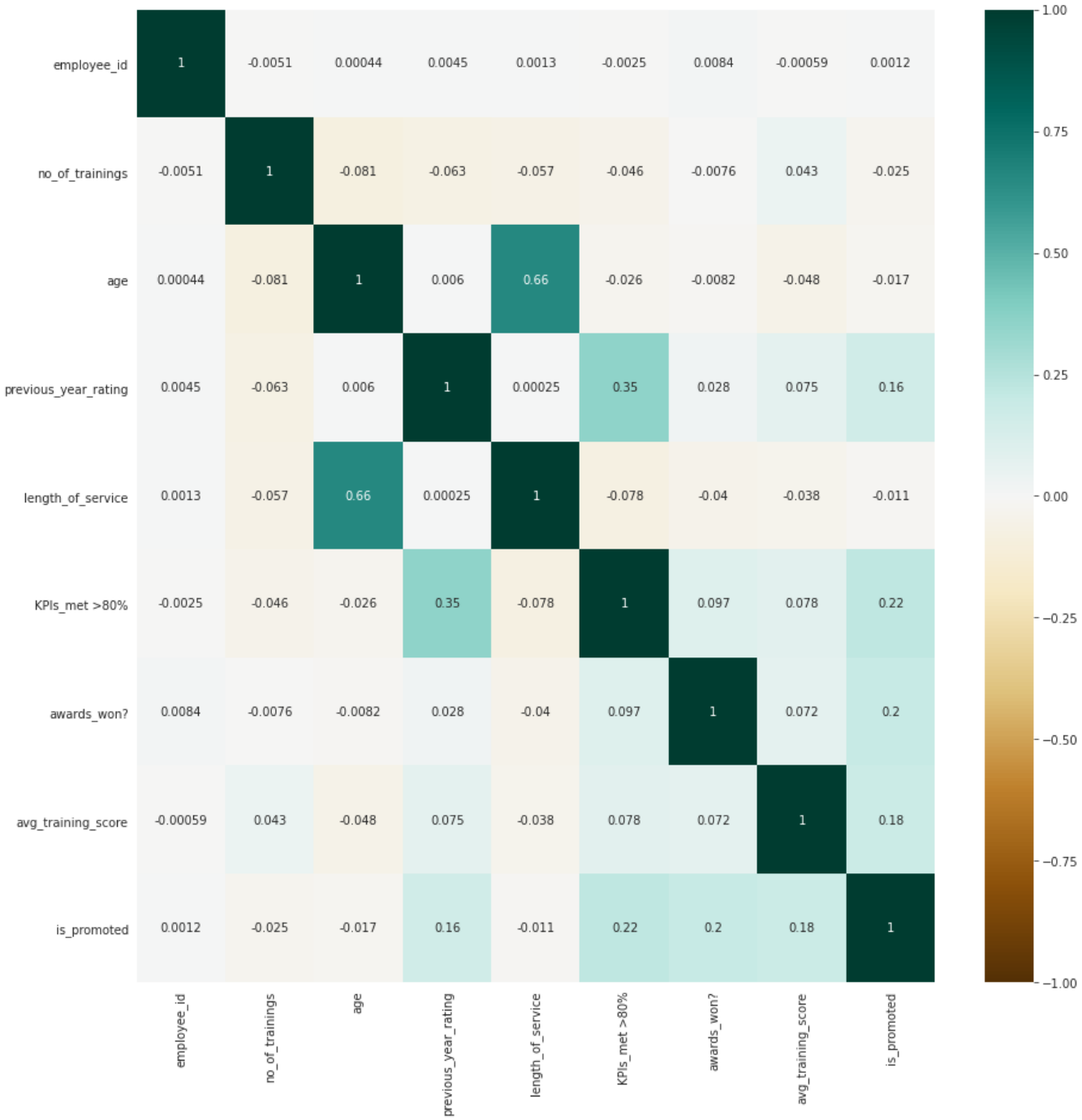
Target Variable:

- Is Promoted

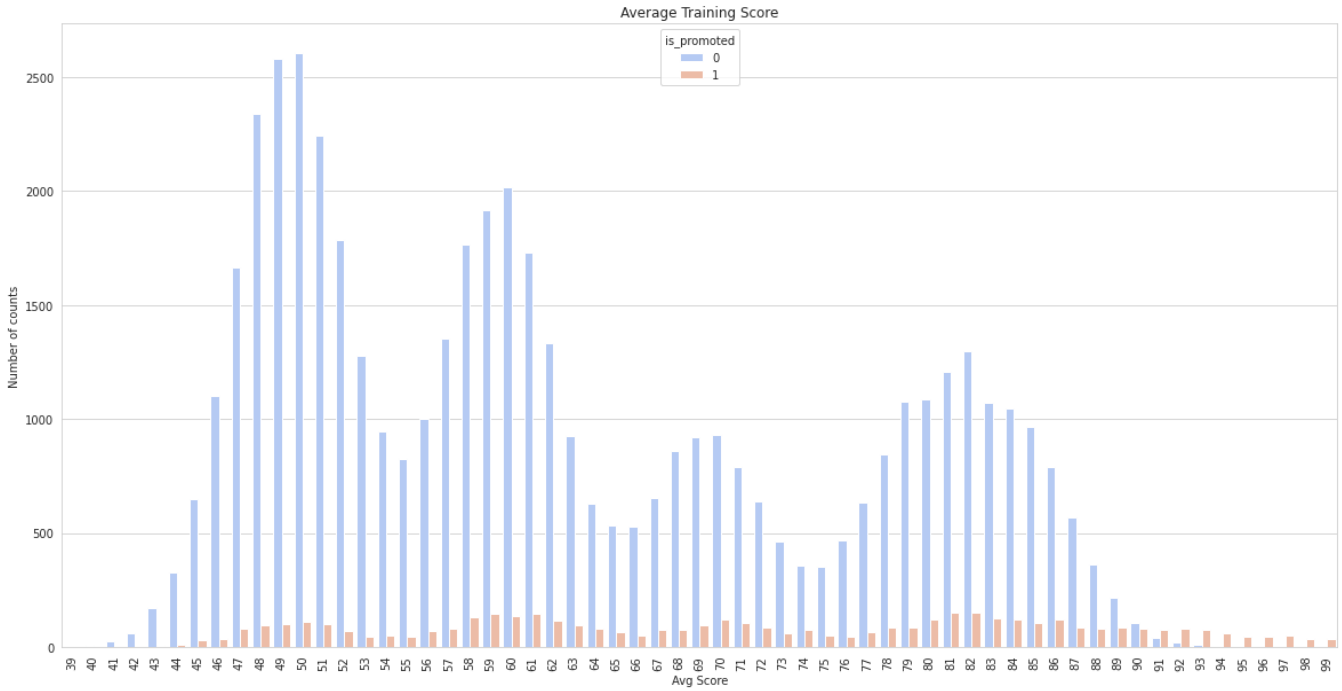
Uniqueness in Each Features

Department	: 9
Region	: 34
Education	: 3
Gender	: 2
Recr. Channel	: 3
No. of Trainings	: 10
Age	: 41
Pre. Year Rating	: 5
Length of Service	: 35
KPI met >80	: 2
Awards Won	: 2
Avg. Training Score	: 61
Is Promoted	: 2

Insights:

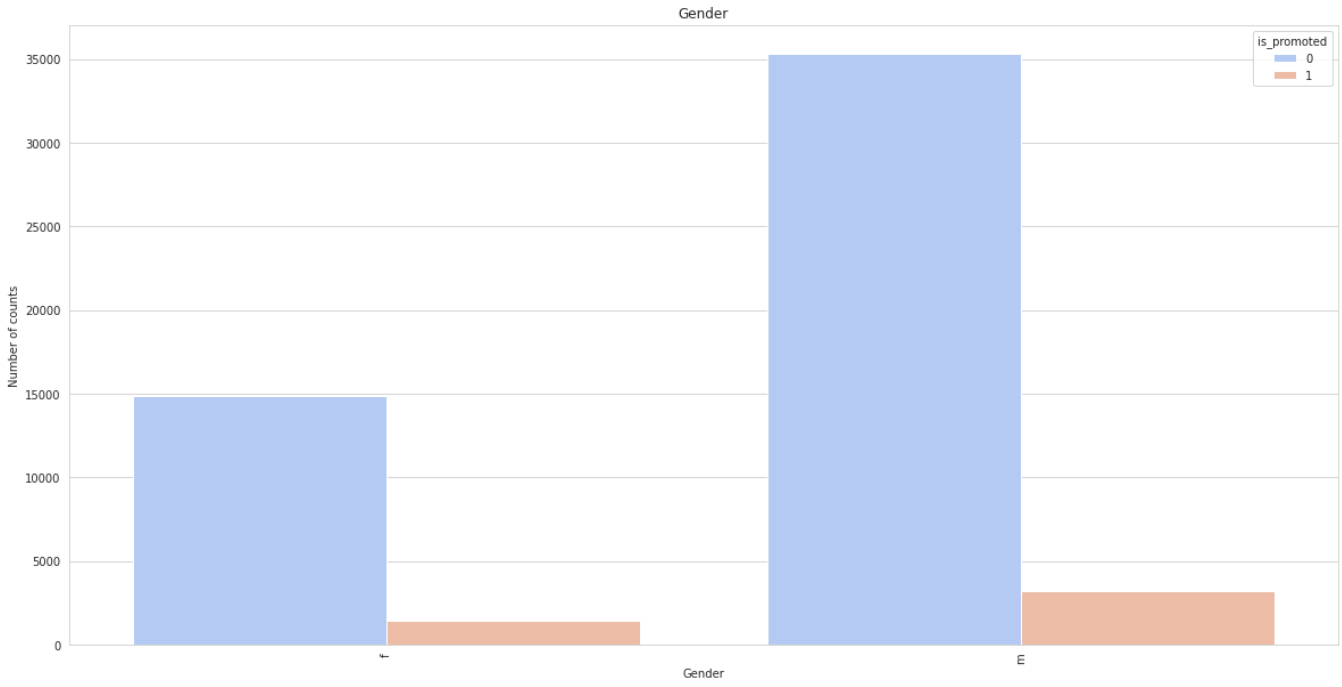


Promotion is not directly related with any features.

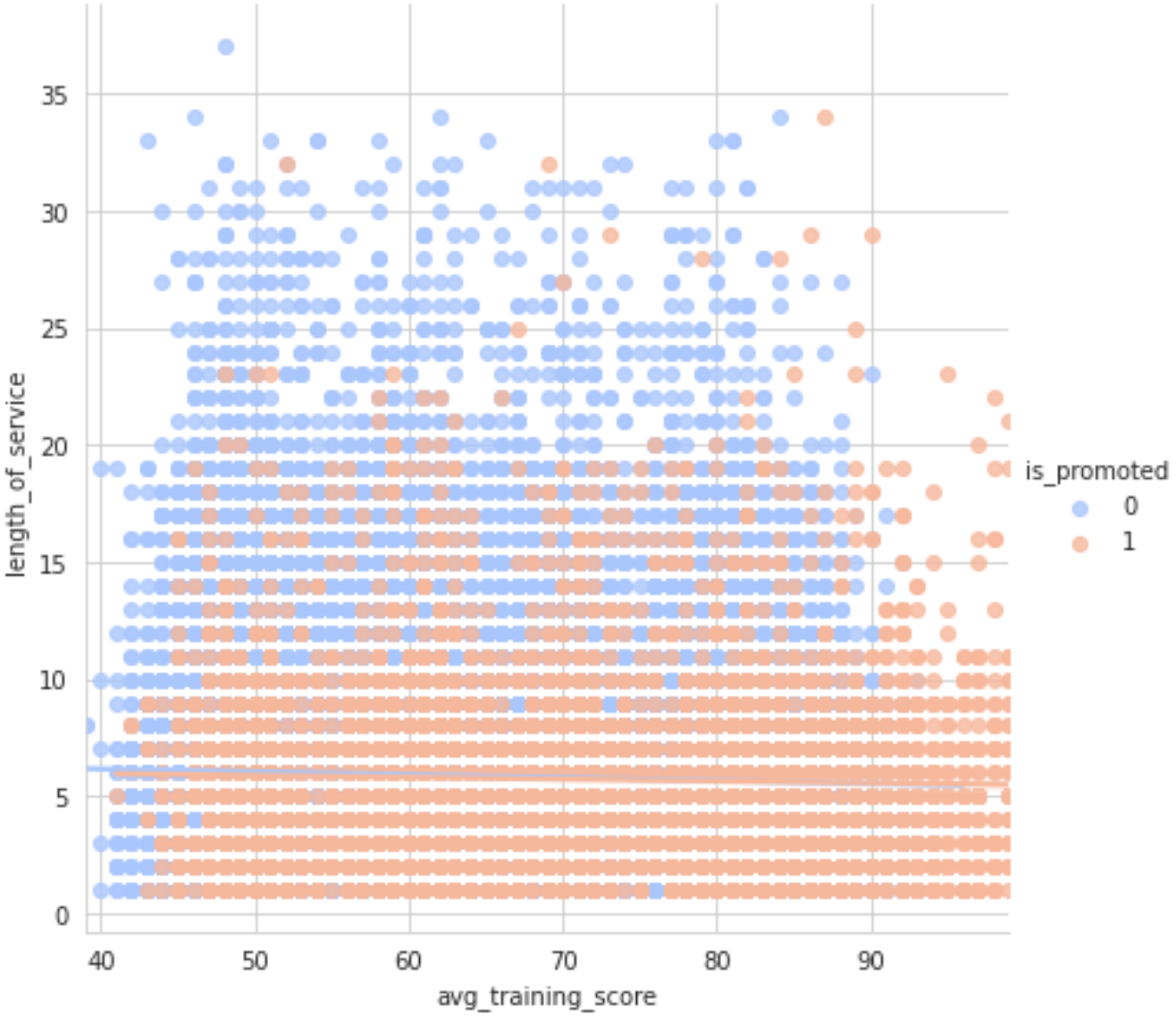


Employee who has average score more than 90 has higher chances of getting promoted.

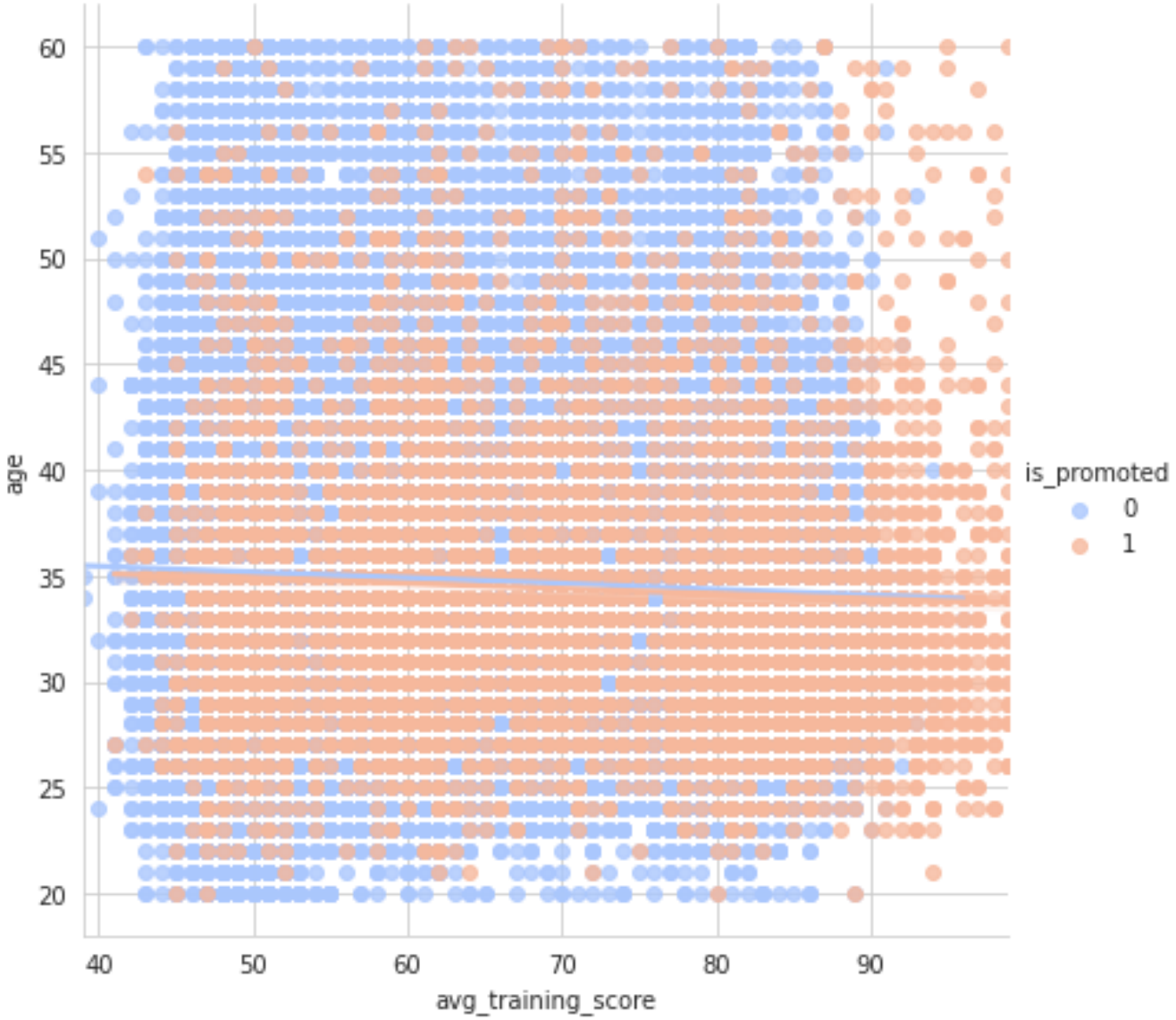
Even if your score is average don't get demotivated you can also be promoted.



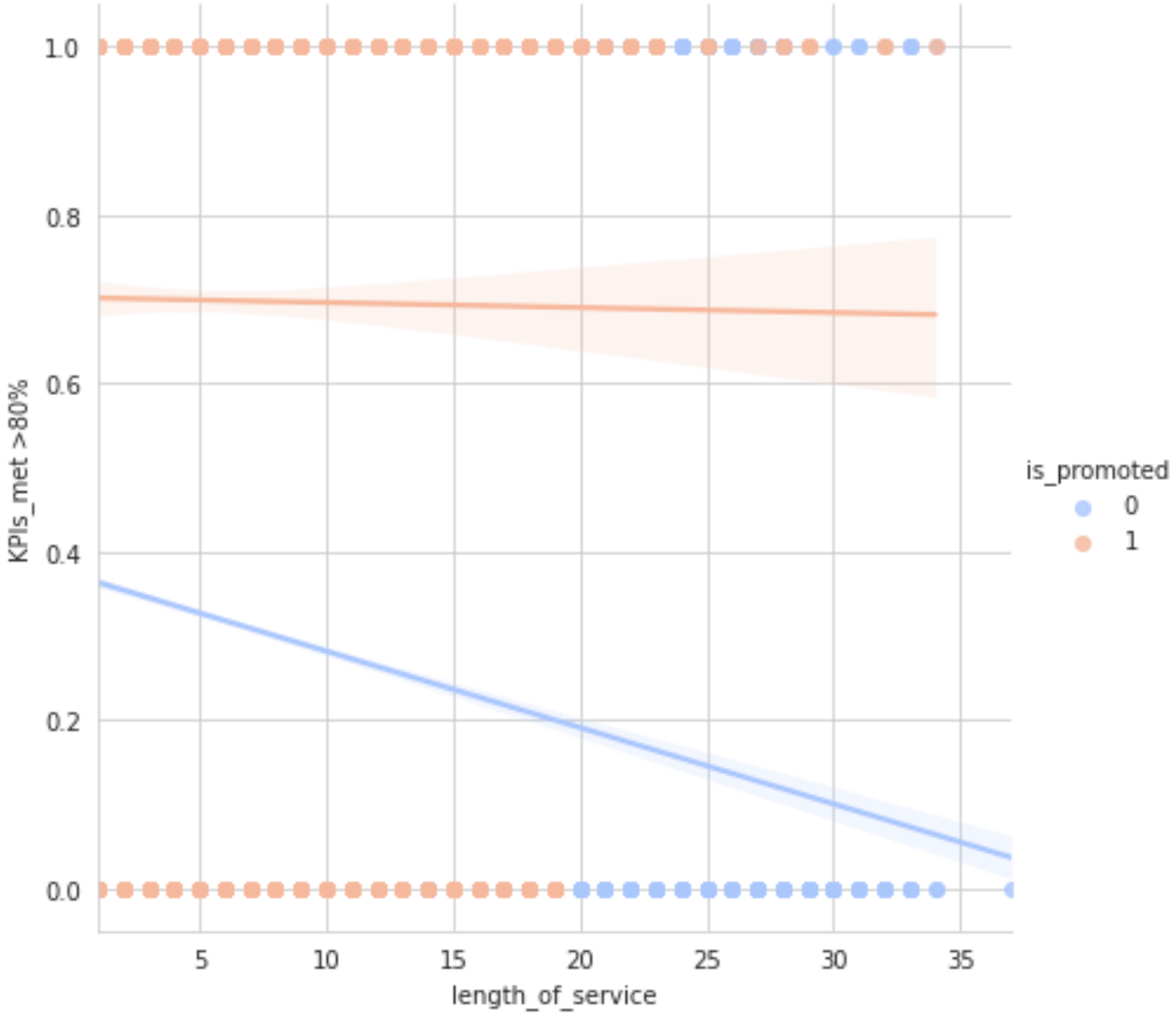
There is no such discrimination between the genders for promotion which shows that the company is unbiased



If the length of service is greater than 25 year there are very few chance to get promoted.



If your age is greater than 40 and your score is greater than 90 then you have the highest probability of getting promoted.



If your KPI is greater than 0.6 then you have greater probability of getting promoted.

Approach:

Methods for Feature Engineering

- Dropping the null Values with One hot encoding (SMOTE Technique For class imbalance)
- Imputing with KNN with Normalization and One hot encoding (SMOTE Technique For class imbalance)

Models Applied

- Logistic Regression
- Random Forest(with fine tunning using Random Search CV)
- ANN

Results:

Models	Method 1(accuracy)	Method 2(accuracy)
Logistic Regression	**0.88**	**0.78**
Random Forest	**0.93**	**0.93**
ANN	**0.93**	**0.94**

Conclusion:

ANN Model used with KNN imputation with Normalization gives the best result with 94% of accuracy.