Data Collection and Preprocessing Phase

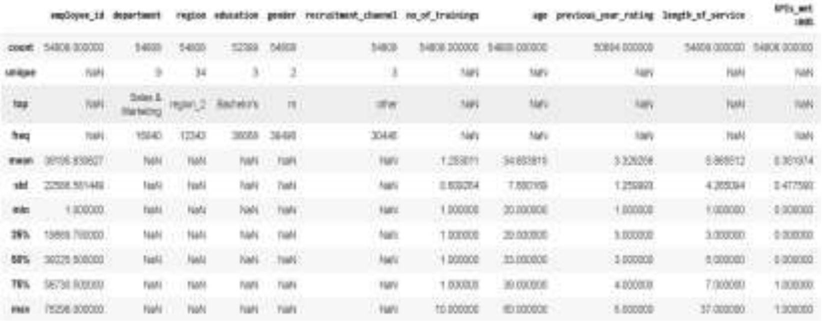
Date	10 July 2024
Team ID	xxxxxx
Project Title	Human Resource Management: Predicting Employee Promotions Using Machine Learning
Maximum Marks	6 Marks

Data Exploration and Preprocessing Report

Identifies data sources, assesses quality issues like missing values and duplicates, and implements resolution plans to ensure accurate and reliable analysis.

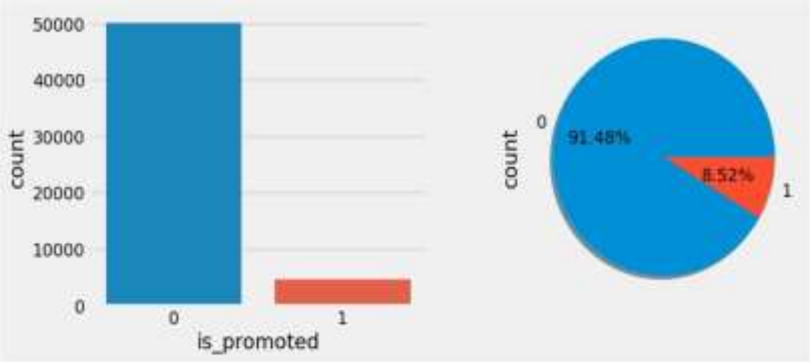
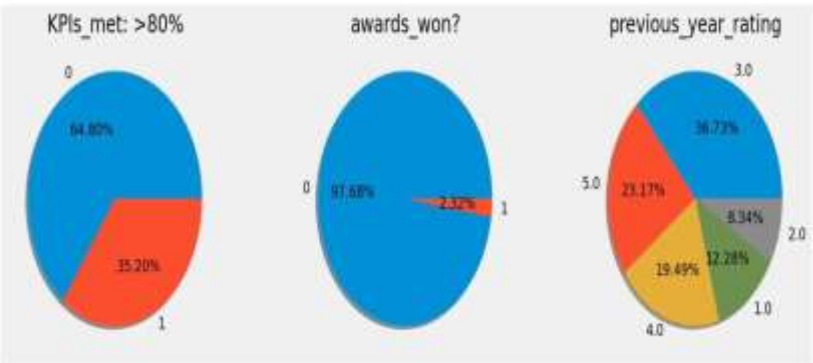
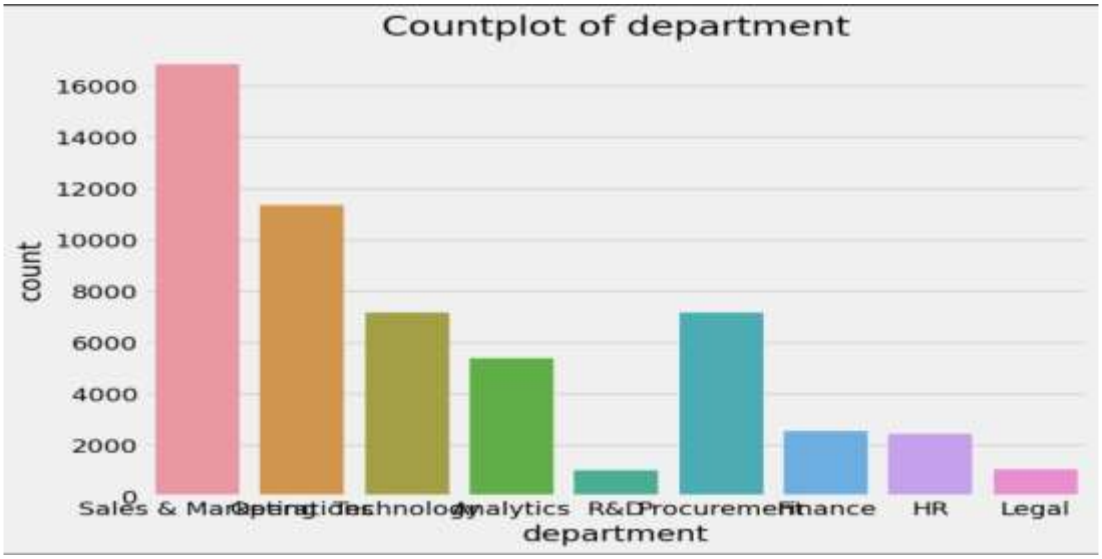
<table>
<tr><th>Section</th><th>Description</th></tr>
<tr><td>Data Overview</td><td>

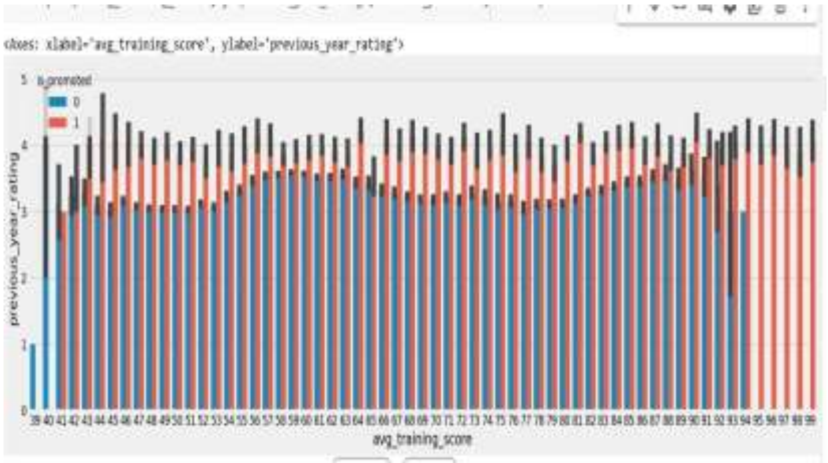
Dimensions:
54808 rows × 14 columns Descriptive statistics:

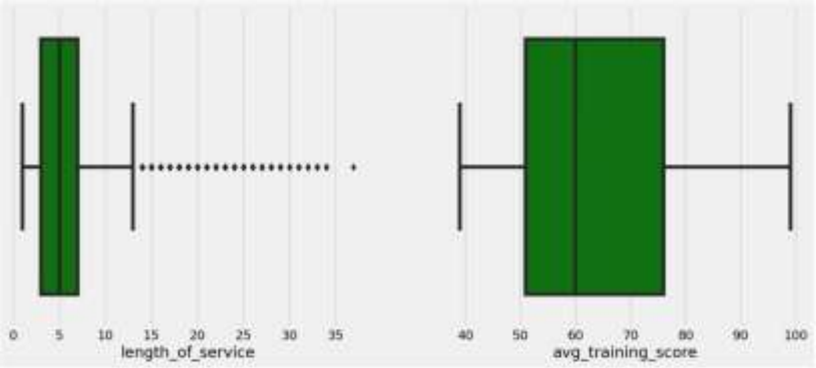
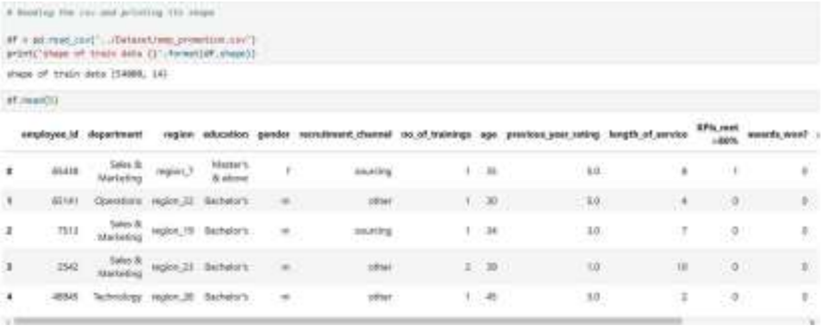


	employee_id	department	region	education	gender	recruitment_channel	no_of_trainings	age	previous_year_rating	length_of_service	KPIs_met >80%
count	54808.000000	54808	54808	52399	54808	54808	54808.000000	54808.000000	50684.000000	54808.000000	54808.000000
unique	NaN	9	34	3	2	3	NaN	NaN	NaN	NaN	NaN
top	NaN	Sales & Marketing	region_2	Bachelor's	m	other	NaN	NaN	NaN	NaN	NaN
freq	NaN	16840	12343	36669	38496	30446	NaN	NaN	NaN	NaN	NaN
mean	39195.830627	NaN	NaN	NaN	NaN	NaN	1.253011	34.803915	3.329256	5.865512	0.351974
std	22586.581449	NaN	NaN	NaN	NaN	NaN	0.609264	7.660169	1.259993	4.265094	0.477590
min	1.000000	NaN	NaN	NaN	NaN	NaN	1.000000	20.000000	1.000000	1.000000	0.000000
25%	19669.750000	NaN	NaN	NaN	NaN	NaN	1.000000	29.000000	3.000000	3.000000	0.000000
50%	39225.500000	NaN	NaN	NaN	NaN	NaN	1.000000	33.000000	3.000000	5.000000	0.000000
75%	58730.500000	NaN	NaN	NaN	NaN	NaN	1.000000	39.000000	4.000000	7.000000	1.000000
max	78298.000000	NaN	NaN	NaN	NaN	NaN	10.000000	60.000000	5.000000	37.000000	1.000000

</td></tr>
</table>

Univariate Analysis	 
Bivariate Analysis	

Multivariate Analysis	

Outliers and Anomalies	
Data Preprocessing Code Screenshots	
Loading Data	

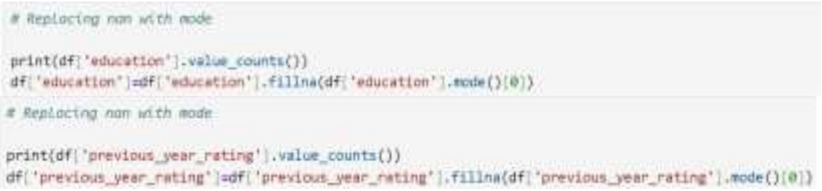
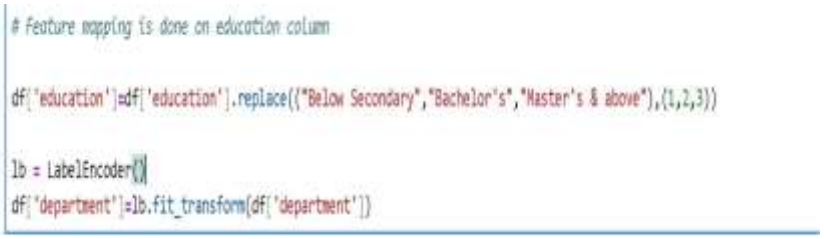
```
# Reading the csv and printing its shape

df = pd.read_csv('../Dataset/emp_promotion.csv')
print('shape of train data {}'.format(df.shape))
```

```
shape of train data (54808, 14)
```

```
df.head()
```

	employee_id	department	region	education	gender	recruitment_channel	no_of_trainings	age	previous_year_rating	length_of_service	KPIs_met >80%	awards_won?
0	65438	Sales & Marketing	region_7	Master's & above	f	sourcing	1	35	5.0	8	1	0
1	65141	Operations	region_22	Bachelor's	m	other	1	30	5.0	4	0	0
2	7513	Sales & Marketing	region_19	Bachelor's	m	sourcing	1	34	3.0	7	0	0
3	2542	Sales & Marketing	region_23	Bachelor's	m	other	2	39	1.0	10	0	0
4	48945	Technology	region_26	Bachelor's	m	other	1	45	3.0	2	0	0

Handling Missing Data	 # Replacing nan with mode print(df['education'].value_counts()) df['education']=df['education'].fillna(df['education'].mode()[0]) # Replacing nan with mode print(df['previous_year_rating'].value_counts()) df['previous_year_rating']=df['previous_year_rating'].fillna(df['previous_year_rating'].mode()[0])
Data Transformation	 # Feature mapping is done on education column df['education']=df['education'].replace(("Below Secondary","Bachelor's","Master's & above"),(1,2,3)) lb = LabelEncoder() df['department']=lb.fit_transform(df['department'])
Feature Engineering	Attached the codes in final submission

Save Processed Data	-