Explotary data analytcise

In [137…

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [138…

```
# Upload the data into dataset
df = pd.read_csv("hr_dashboard_data.csv")
```

In [139…

```
# Read the dataset
df.tail()
```

Out[139…

	Name	Age	Gender	Projects Completed	Productivity (%)	Satisfaction Rate (%)	Feedback Score
195	Stephanie Fisher	29	Female	9	32	87	3.5
196	Jeremy Miller	26	Male	7	45	28	2.8
197	Daniel Pierce	22	Male	3	36	77	1.6
198	Michael Hernandez	36	Female	23	96	50	3.4
199	Victor Gutierrez	43	Male	10	86	71	2.0

In [140…

```
# Information on dataset
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 11 columns):
 #   Column                 Non-Null Count  Dtype  
---  ------                 --------------  -----  
 0   Name                   200 non-null    object 
 1   Age                    200 non-null    int64  
 2   Gender                 200 non-null    object 
 3   Projects Completed     200 non-null    int64  
 4   Productivity (%)       200 non-null    int64  
 5   Satisfaction Rate (%)  200 non-null    int64  
 6   Feedback Score         200 non-null    float64
 7   Department             200 non-null    object 
 8   Position               200 non-null    object 
 9   Joining Date           200 non-null    object 
 10  Salary                 200 non-null    int64  
dtypes: float64(1), int64(5), object(5)
memory usage: 17.3+ KB
```

In [141…

```
# Converting Joining Date into date type
df['Joining Date']=pd.to_datetime(df['Joining Date'],format="%b-%y")
df['Experience']=2025-df['Joining Date'].dt.year
df.head()
```

Out[141…

	Name	Age	Gender	Projects Completed	Productivity (%)	Satisfaction Rate (%)	Feedback Score	De
0	Douglas Lindsey	25	Male	11	57	25	4.7	
1	Anthony Roberson	59	Female	19	55	76	2.8	
2	Thomas Miller	30	Male	8	87	10	2.4	
3	Joshua Lewis	26	Female	1	53	4	1.4	
4	Stephanie Bailey	43	Male	14	3	9	4.5	

Cleaning is done and managing data types.

Each column datatype is suitable for each columns

In [142…

```
df.isnull().sum()
```

Out[142…

```
Name                    0
Age                     0
Gender                  0
Projects Completed      0
Productivity (%)        0
Satisfaction Rate (%)   0
Feedback Score          0
Department              0
Position                0
Joining Date            0
Salary                  0
Experience              0
dtype: int64
```

Here we can see that our data is null free

In [143…

```
df.describe()
```

Out[143…

	Age	Projects Completed	Productivity (%)	Satisfaction Rate (%)	Feedback Score	Joining Date
count	200.000000	200.000000	200.000000	200.000000	200.000000	200
mean	34.650000	11.455000	46.755000	49.935000	2.883000	2014-01-11 20:45:36
min	22.000000	0.000000	0.000000	0.000000	1.000000	1998-01-01 00:00:00
25%	26.000000	6.000000	23.000000	25.750000	1.900000	2008-01-01 00:00:00
50%	32.000000	11.000000	45.000000	50.500000	2.800000	2017-01-01 00:00:00
75%	41.000000	17.000000	70.000000	75.250000	3.900000	2020-01-01 00:00:00
max	60.000000	25.000000	98.000000	100.000000	4.900000	2022-01-01 00:00:00
std	9.797318	6.408849	28.530068	28.934353	1.123263	NaN

Describe the whole numerical dataset here.

In [144…

```
bins = [20,25,30,35,40,45,50,55,60]
labels =  ['20-25','25-30','30-35','35-40','40-45','45-50','50-55','55-60']
df['Age Group'] = pd.cut(df['Age'],bins = bins,labels = labels, right=False)
```

In [145…

```
df.head()
```

Out[145…

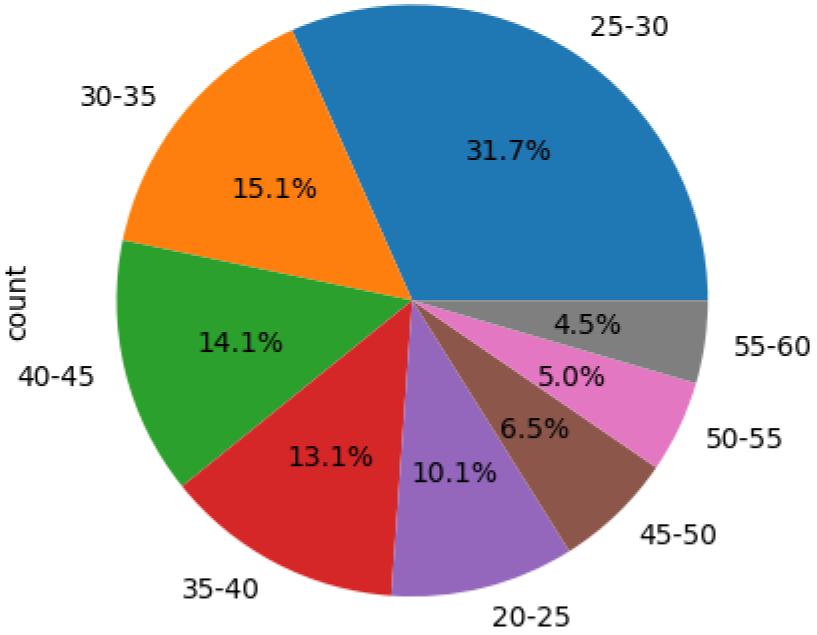
	Name	Age	Gender	Projects Completed	Productivity (%)	Satisfaction Rate (%)	Feedback Score	De
0	Douglas Lindsey	25	Male	11	57	25	4.7	
1	Anthony Roberson	59	Female	19	55	76	2.8	
2	Thomas Miller	30	Male	8	87	10	2.4	
3	Joshua Lewis	26	Female	1	53	4	1.4	
4	Stephanie Bailey	43	Male	14	3	9	4.5	

In [146…

```
# With Age-Group(derived from 'Age' column)
df['Age Group'].value_counts().plot.pie(autopct='%1.1f%%')
```

Out[146…

```
<Axes: ylabel='count'>
```



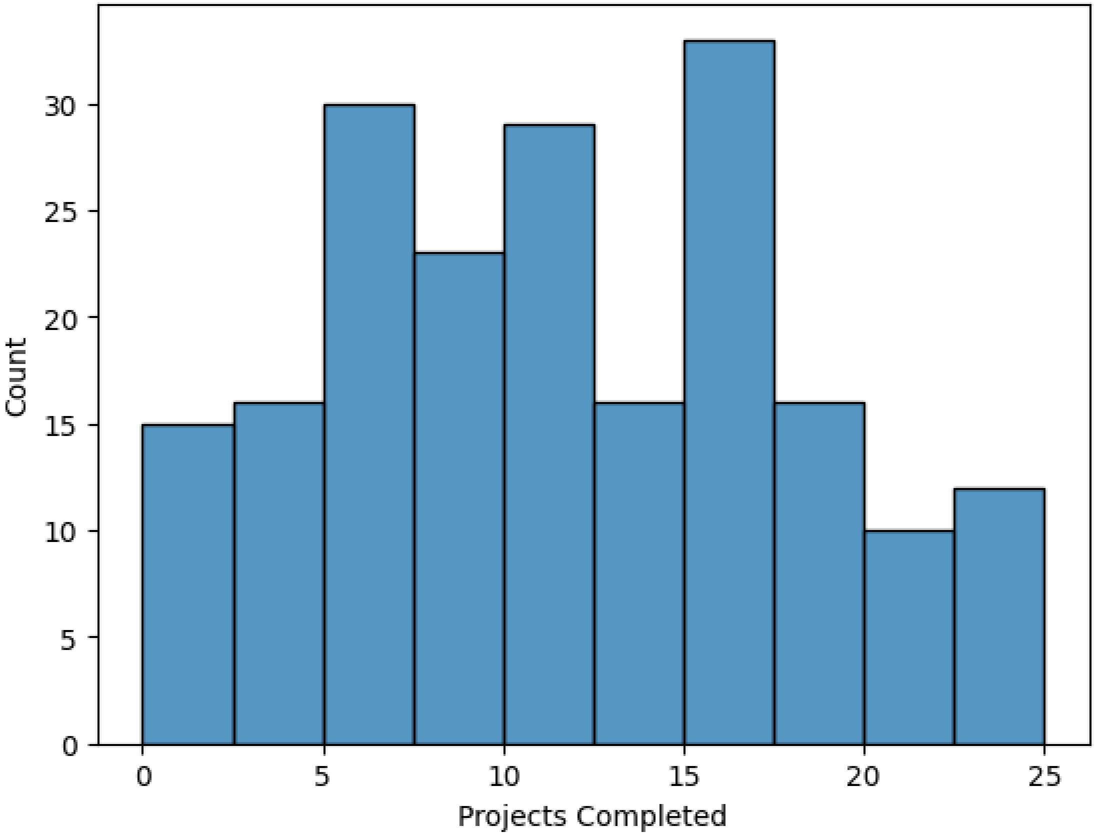
Showing heavily concentrated in the 25–30 age group.

In [147…

```
# By using 'Projects Completed' column
sns.histplot(df['Projects Completed'],bins=10)
```

Out[147…

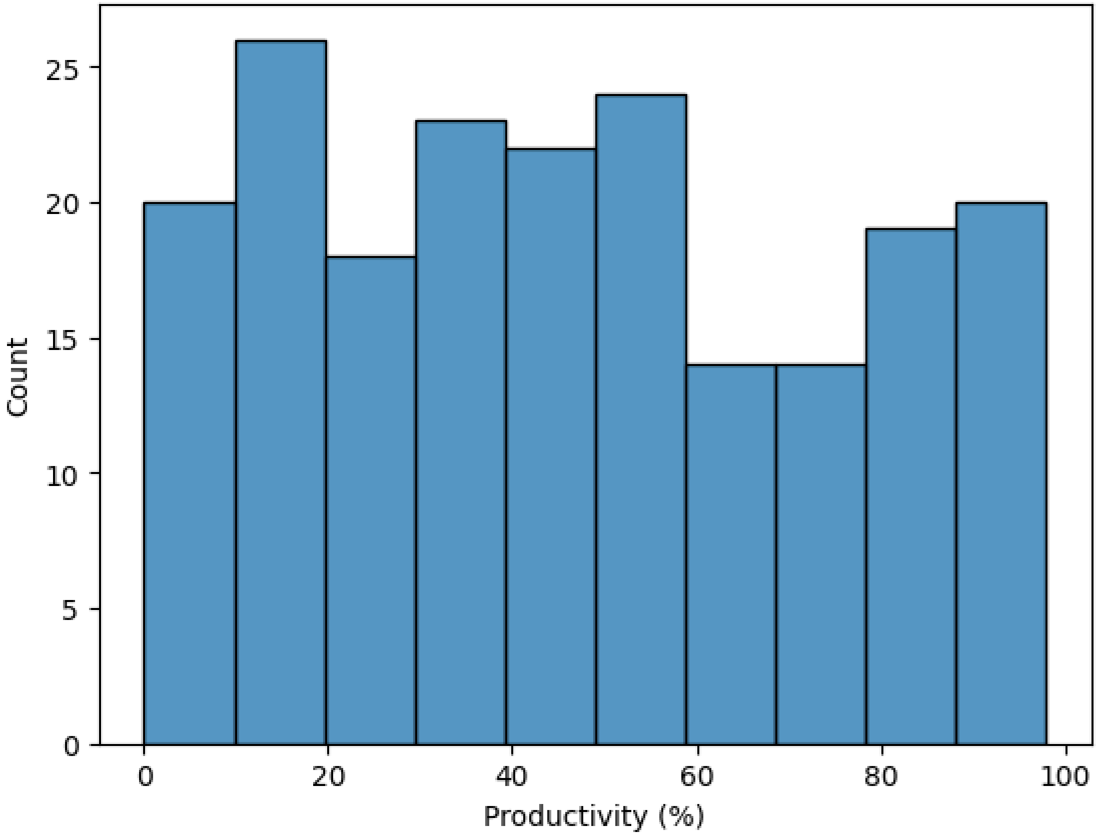
```
<Axes: xlabel='Projects Completed', ylabel='Count'>
```



The distribution of projects completed is spread fairly evenly, with most employees completing between 5–17 projects. No extreme imbalance was found.”

```
In [148…  # By using 'Productivity' column
          sns.histplot(df['Productivity (%)'],bins=10)
```

```
Out[148…  <Axes: xlabel='Productivity (%)', ylabel='Count'>
```



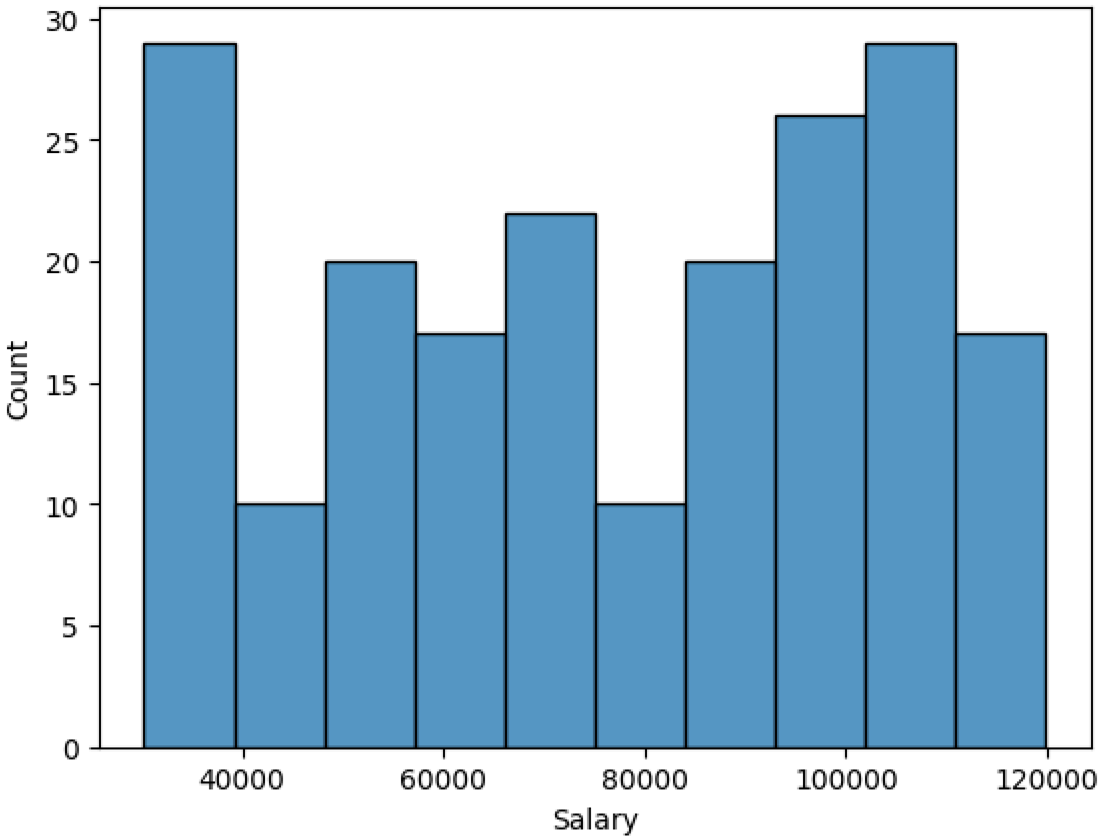
A large number comes within moderate, which suggest room for improvement.

In [149…

```
# By Using Salary column
sns.histplot(df['Salary'],bins=10)
```

Out[149…

```
<Axes: xlabel='Salary', ylabel='Count'>
```



A significate number falls under lowest salary bracket and a substantinal group in the higher salary bracket.

In [150…

```
# What is the average salary for each position?
df.groupby('Position')['Salary'].mean().round(2)
```

Out[150…

```
Position
Analyst               68195.70
Intern                34811.50
Junior Developer      52104.11
Manager              110091.48
Senior Developer      86481.50
Team Lead            100228.06
Name: Salary, dtype: float64
```

In [151…

```
# Which department has the most experienced employees?
df.groupby('Department')['Experience'].mean().round(2)
```

Out[151…

```
Department
Finance      11.46
HR           10.53
IT           12.29
Marketing    10.05
Sales        10.60
Name: Experience, dtype: float64
```

In [152…

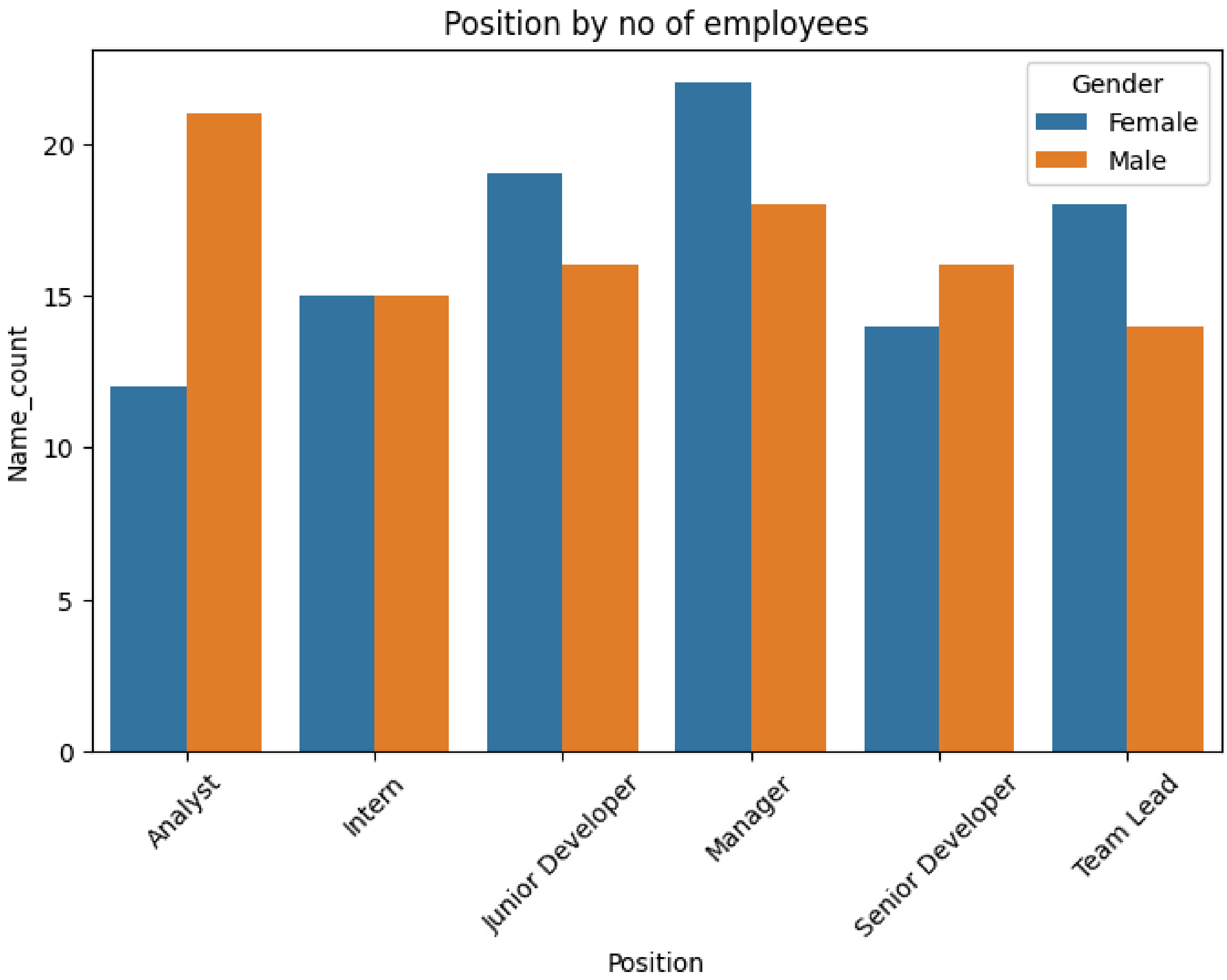
```
emp_count = df.groupby(['Position','Gender']).size().reset_index(name='Name_cc
emp_count
```

Out[152…

	Position	Gender	Name_count
0	Analyst	Female	12
1	Analyst	Male	21
2	Intern	Female	15
3	Intern	Male	15
4	Junior Developer	Female	19
5	Junior Developer	Male	16
6	Manager	Female	22
7	Manager	Male	18
8	Senior Developer	Female	14
9	Senior Developer	Male	16
10	Team Lead	Female	18
11	Team Lead	Male	14

In [153…

```
# Position + No of employee + gender
plt.figure(figsize=(8,5))
sns.barplot(x='Position',y='Name_count',hue = 'Gender',data=emp_count)
plt.title('Position by no of employees')
plt.xticks(rotation=45)
plt.show()
```



Overall, there appear to be equal no of both gender, with the most significant disparity observed in the 'Analyst' role and 'Manager' role.

In [154…

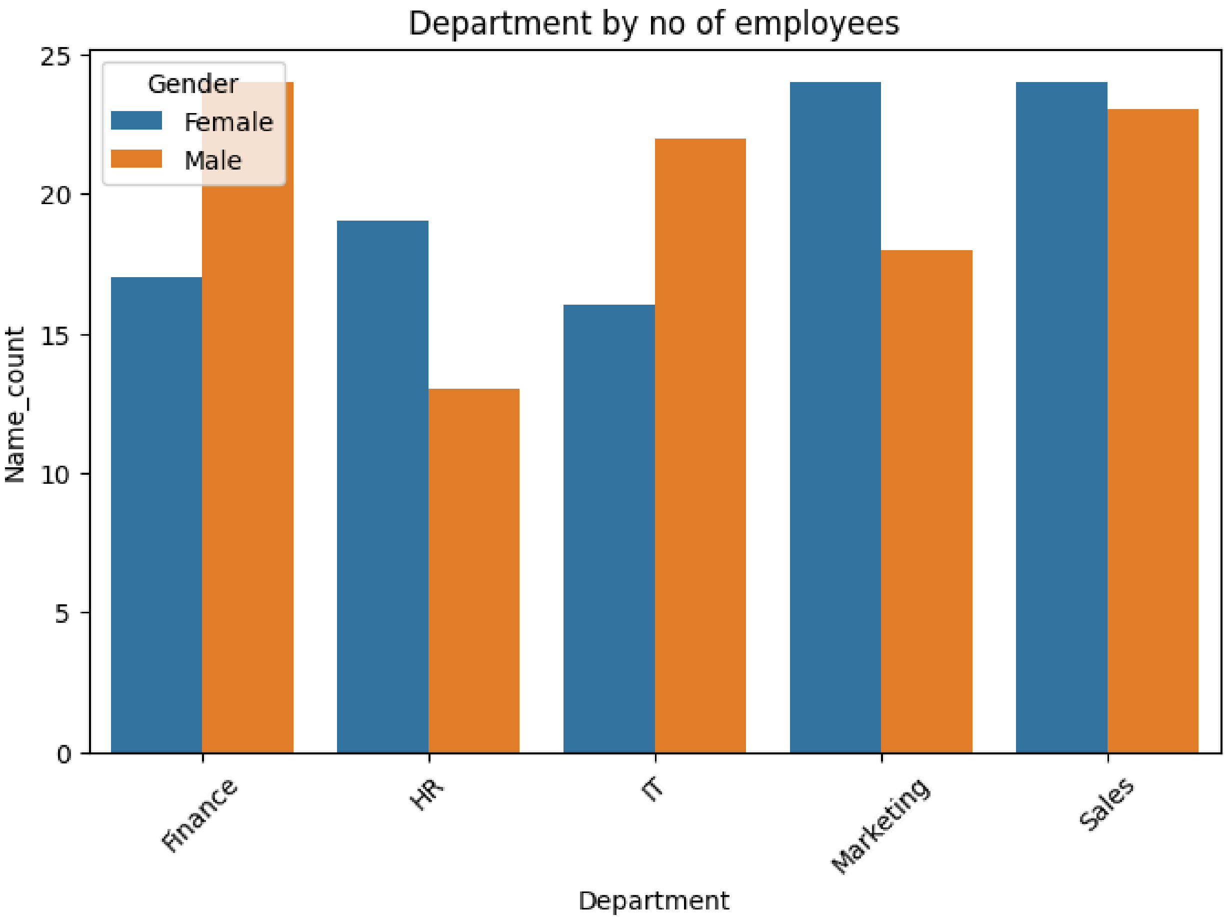
```
emp_count1 = df.groupby(['Department','Gender']).size().reset_index(name='Name
emp_count1
```

Out[154…

	Department	Gender	Name_count
0	Finance	Female	17
1	Finance	Male	24
2	HR	Female	19
3	HR	Male	13
4	IT	Female	16
5	IT	Male	22
6	Marketing	Female	24
7	Marketing	Male	18
8	Sales	Female	24
9	Sales	Male	23

In [155…

```
# Department + No of employee + gender
plt.figure(figsize=(8,5))
sns.barplot(x='Department',y='Name_count',hue = 'Gender',data=emp_count1)
plt.title('Department by no of employees')
plt.xticks(rotation=45)
plt.show()
```

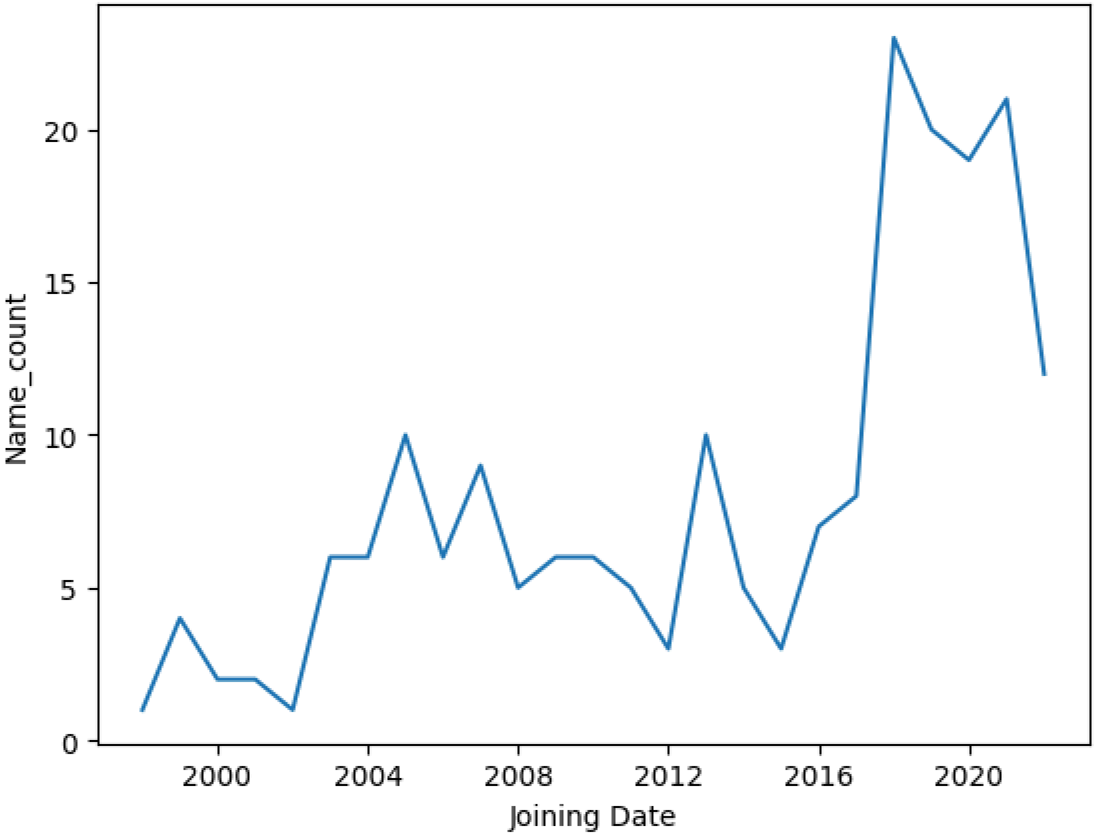


'Finence', 'HR', 'IT' and 'Marketing' depatment has most disparity, other habd 'sales' seems moderate.

```
In [156…  emp_count2 = df.groupby(['Joining Date']).size().reset_index(name='Name_count'
```

```
In [157…  sns.lineplot(x='Joining Date',y='Name_count', data=emp_count2)
```

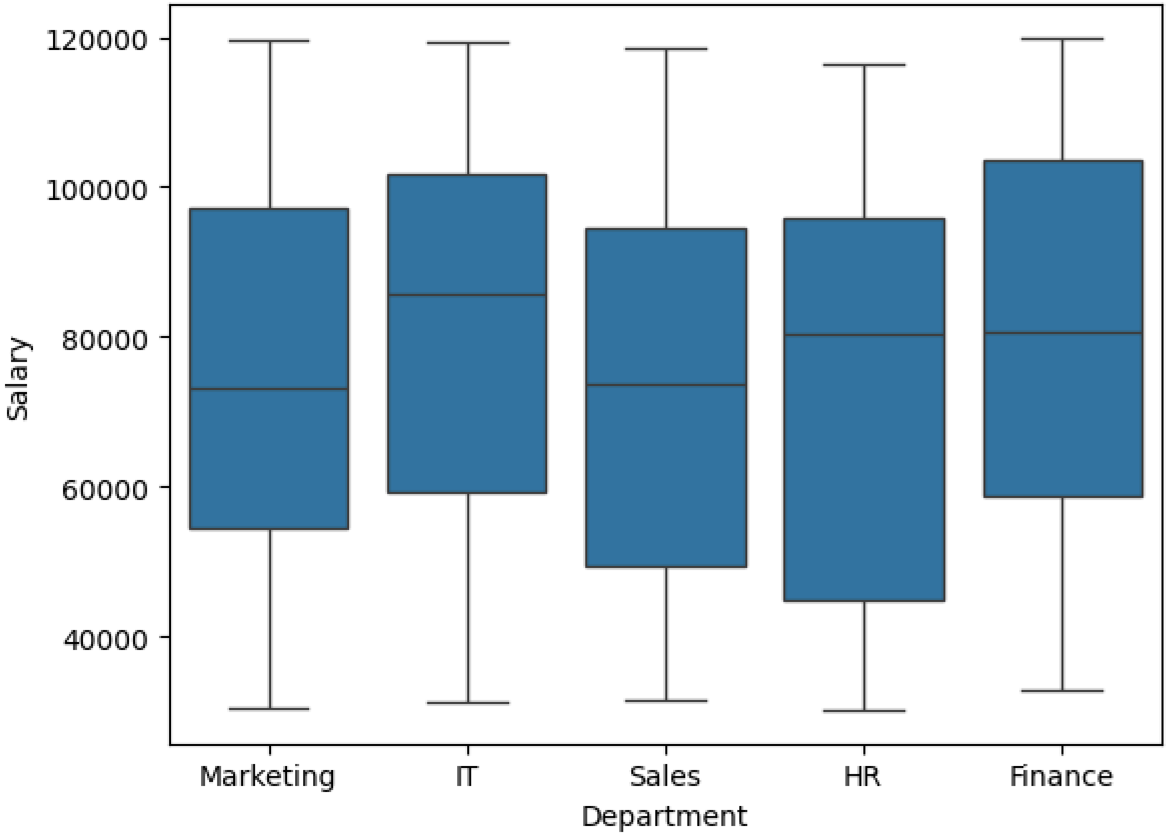
```
Out[157…  <Axes: xlabel='Joining Date', ylabel='Name_count'>
```



Number incresed of employees who joined organisation in between 2018 to 2022

```
In [158…  sns.boxplot(x='Department',y='Salary',data=df)
```

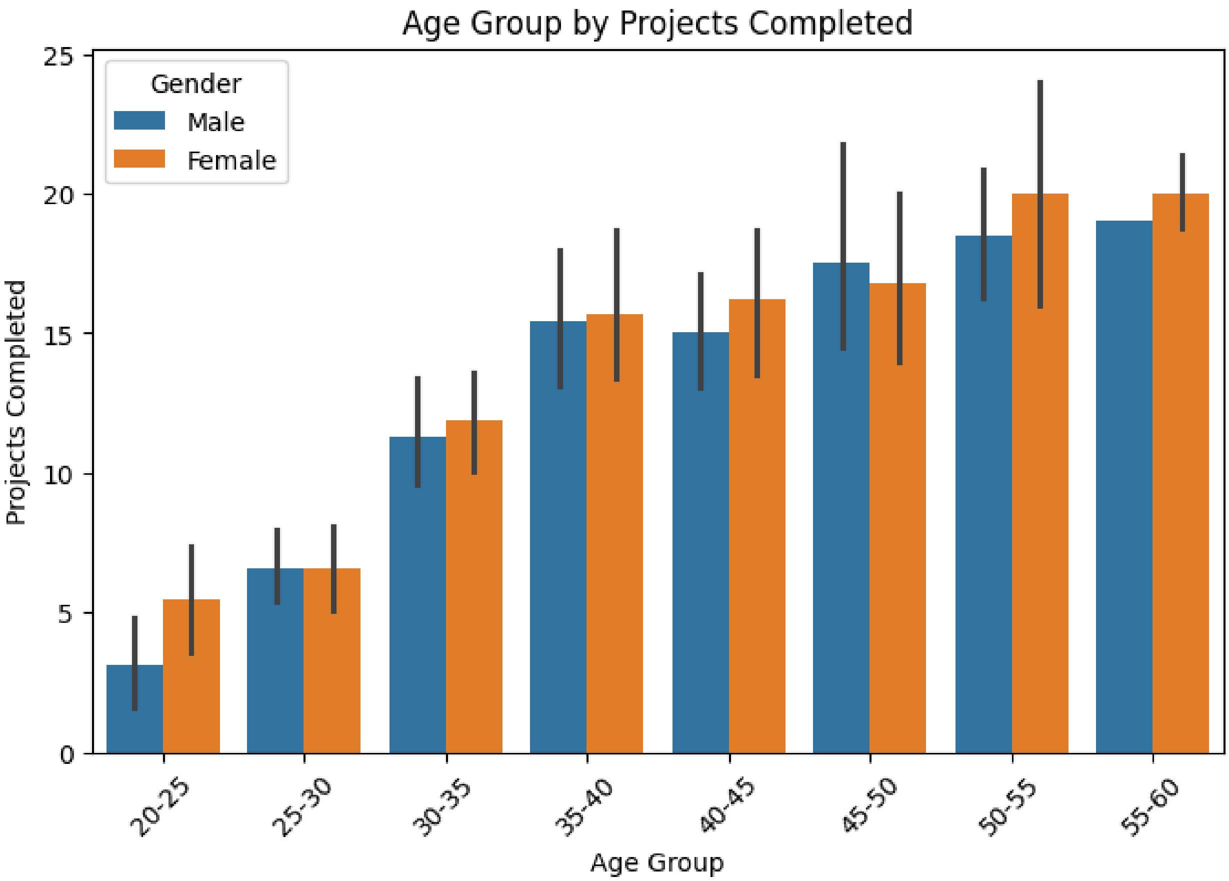
```
Out[158…  <Axes: xlabel='Department', ylabel='Salary'>
```



Marketting department geting muvh lesser than others. Most HR getting less salary then average salary.

In [159…

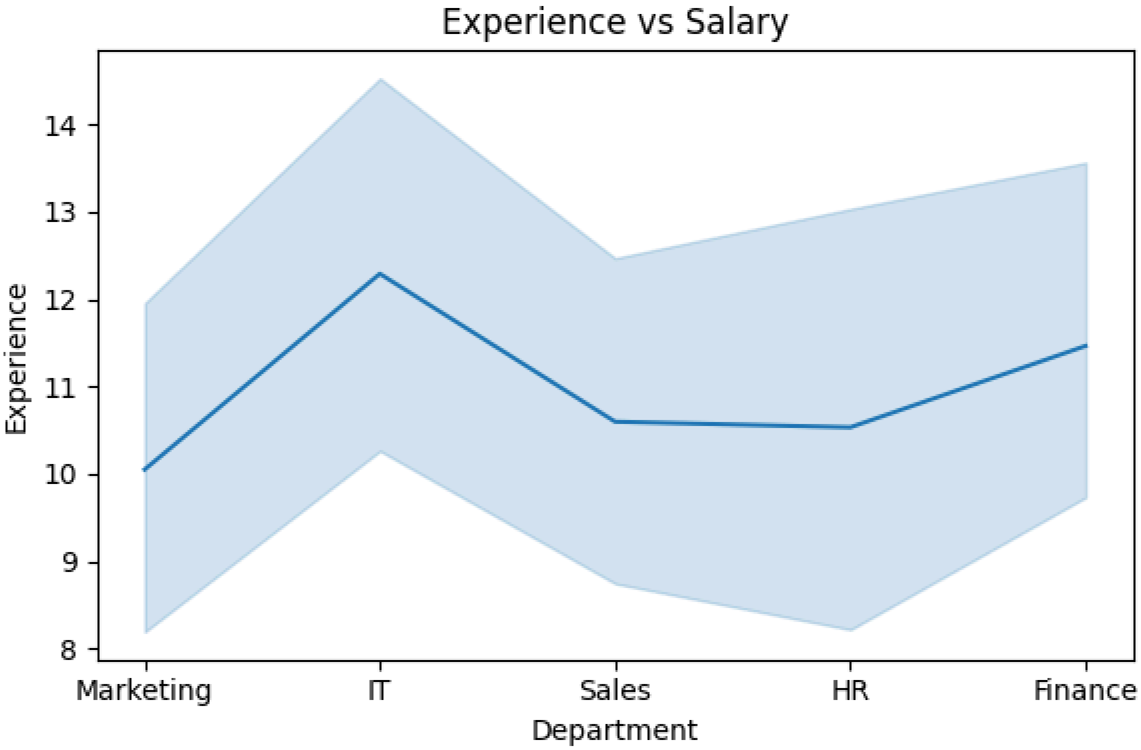
```
plt.figure(figsize=(8,5))
sns.barplot(y='Projects Completed',x='Age Group',hue = 'Gender',data=df)
plt.title('Age Group by Projects Completed')
plt.xticks(rotation=45)
plt.show()
```



No of Project incresed based on age or we can say that age and project are directly propostion to each other.

In [160…

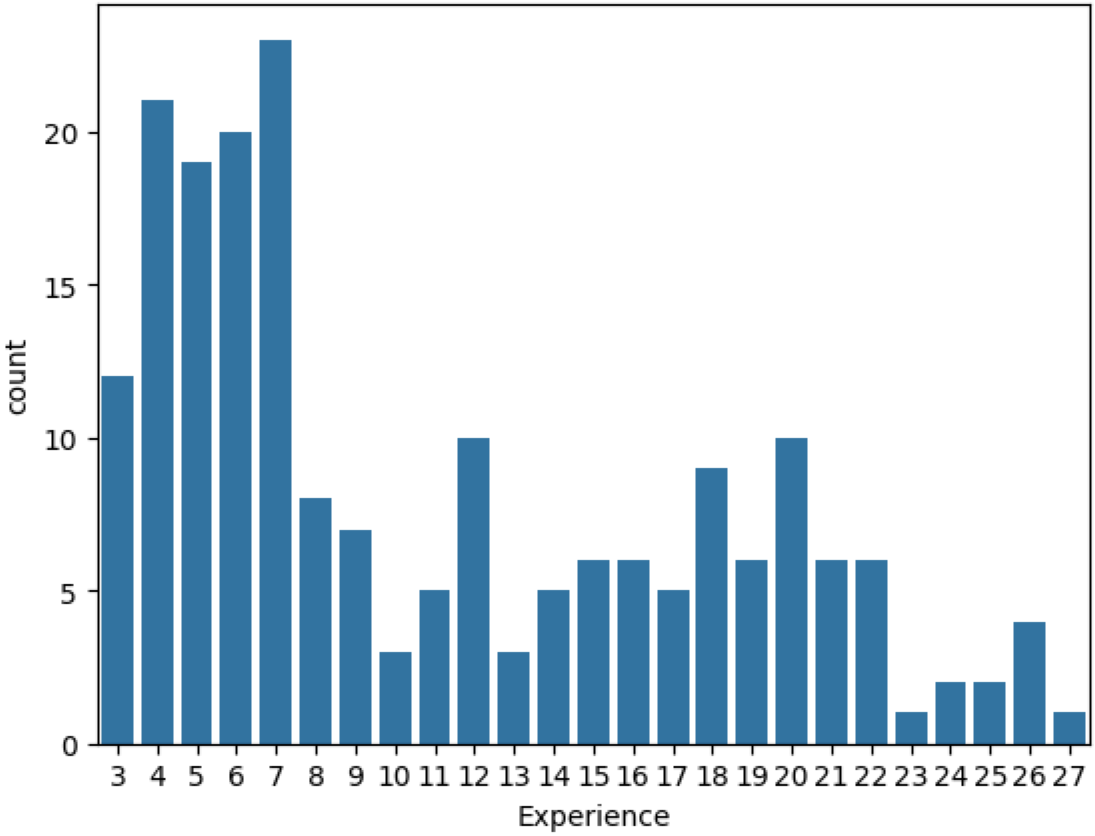
```
plt.figure(figsize=(6, 4))
sns.lineplot(x='Department', y='Experience', data=df)
plt.title('Experience vs Salary')
plt.tight_layout()
plt.show()
```



'IT' and 'Finance' has much experience employees

```
In [161…  # Experience
          sns.countplot(x='Experience',data=df)
```

```
Out[161…  <Axes: xlabel='Experience', ylabel='count'>
```



It shows that company is good for short work but for long term, it is not.