PROJECT DOCUMENTS

Project Title

Human Resources Analytics

Team Number &Teammates:

TEAM 13
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Department: CSE-A
Year : II Year

Description About the project:

Description:

Human resource analytics involves the use of data analysis and statistical techniques to gain insights into various aspects of an organization's workforce. By analyzing, HR data such as employee turnover, performance ratings, training hours, and more, organizations can make informed decisions to optimize their HR processes, improve employee engagement, and drive business success.

Employee Turnover Analysis:

This involves analyzing turnover rates, reasons for turnover, and identifying patterns or trends associated with employee exits. Understanding turnover can help organizations implement strategies to improve employee retention and reduce recruitment costs.

Performance Analysis:

HR analytics examines employee performance metrics such as productivity, efficiency, and effectiveness. By analyzing performance data, organizations can identify top performers, areas for improvement, and factors influencing performance.

Training and Development Analysis:

This aspect focuses on evaluating the effectiveness of training programs and development initiatives. HR analytics can assess training outcomes, identify skill gaps, and determine the ROI of training investments.

Workforce Planning:

HR analytics aids in workforce planning by forecasting future staffing needs based on factors such as turnover rates, growth projections, and skill requirements. This enables organizations to proactively address talent gaps and align workforce resources with business objectives.

Diversity and Inclusion Analysis:

HR analytics examines diversity and inclusion metrics to assess representation, identify disparities, and measure the impact of diversity initiatives on organizational performance and culture.

Compensation and Benefits Analysis:

This involves analyzing compensation and benefits data to ensure fair and competitive pay practices, identify cost-saving opportunities, and assess the effectiveness of incentive programs.

Organizational Structure and Reporting Analysis:

HR analytics can visualize organizational hierarchies, reporting structures, and departmental relationships to understand communication flows, decision-making processes, and leadership effectiveness.

Overall, human resources analytics enables organizations to make data-driven decisions related to workforce management, talent acquisition, employee engagement, and organizational effectiveness. By leveraging HR data and analytics tools, organizations can optimize their HR practices, enhance employee experiences, and drive business success.

How DV works in real estate market analysis:

Data visualization plays a crucial role in human resources analytics by helping HR professionals understand complex datasets and communicate insights effectively. Here's how data visualization works in human resources analytics:

→Understanding Data:

→Identifying Insights:

→Communicating Findings:

→Monitoring Key Metrics:

→Driving Action:

→Enhancing Employee Experience

Heatmap:

The heatmap visualizes the average turnover rate by department using the sns.heatmap() function from the Seaborn library. Each cell in the heatmap represents the turnover rate for a specific department.

Bar Plot:

The bar plot visualizes the relationship between department and performance rating using the sns.barplot() function from Seaborn. It shows the average performance rating for each department.

Pie Chart:

The pie chart visualizes the distribution of employee turnover using the plt.pie() function from Matplotlib. It shows the percentage of employees who left (turnover) and those who stayed.

Organizational Chart:

The code creates an organizational chart using the NetworkX library to visualize reporting structures. It represents employees as nodes and their reporting relationships as edges in a directed graph.

Funnel Chart:

The funnel chart visualizes employee turnover rates by department using the plt.plot() function from Matplotlib. Each department is represented on the x-axis, and the turnover rate is represented on the y-axis.

Violin Plot:

The violin plot visualizes the distribution of employee turnover rates by department using the sns.violinplot() function from Seaborn. It shows the distribution of turnover rates for each department

Code and Output:

We can visualize the Human Resourcs analysis using Data Visualization method to visualize the datas with different types of charts by the following points

- Analyze HR data (e.g., employee turnover, performance ratings, training hours) for a company.
- Visualize employee turnover rates using bar charts or pie charts.
- Create organizational charts to visualize reporting structures and departmental hierarchies.

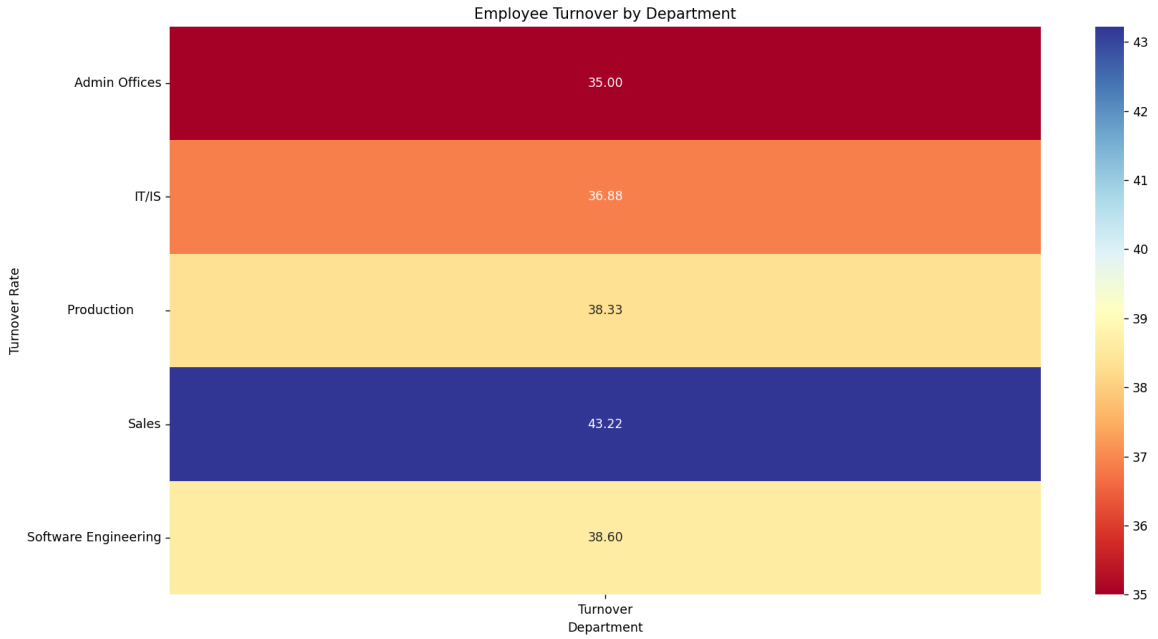
Packages that are used:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import networkx as nx
```

```
# Load HR data into a pandas DataFrame
hr_data=pd.read_csv('C:/Users/balah/HRDataset_v14.csv')
```

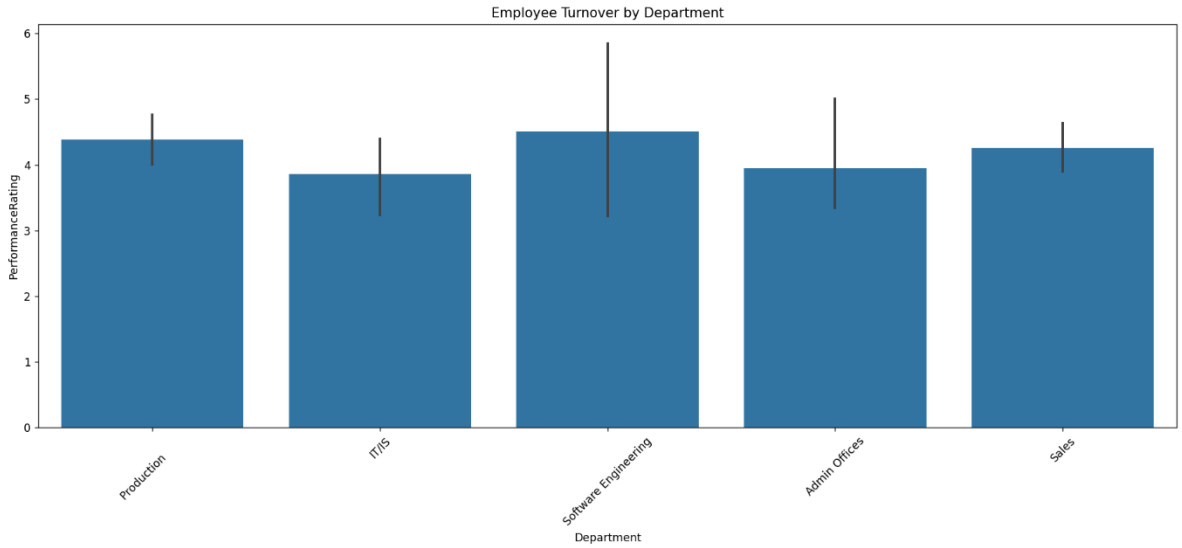
HEATMAP:

```python
# Analyze employee turnover
turnover_rate = (hr_data['Turnover'].sum() / len(hr_data)) * 100
print(f"Turnover Rate: {turnover_rate:.2f}%")

# Visualize employee turnover rates using a heatmap
turnover_by_department = pd.pivot_table(hr_data, values='Turnover', index='Department', aggfunc='mean')
plt.figure(figsize=(10, 6))
sns.heatmap(turnover_by_department, cmap='RdYlBu', annot=True, fmt=".2f")
plt.title('Employee Turnover by Department')
plt.xlabel('Department')
plt.ylabel('Turnover Rate')
plt.tight_layout()
plt.show()
```

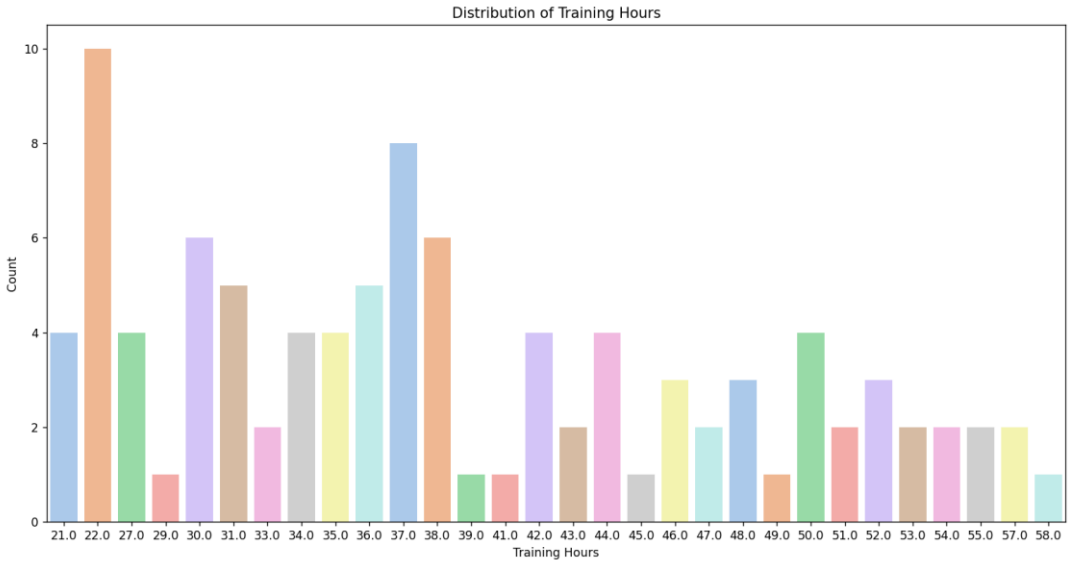


BARPLOT:

```python
# Visualize employee turnover rates using a bar plot
plt.figure(figsize=(10, 6))
sns.barplot(x='Department', y='PerformanceRating', data=hr_data)
plt.xlabel('Department')
plt.ylabel('PerformanceRating')
plt.title('Employee Turnover by Department')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

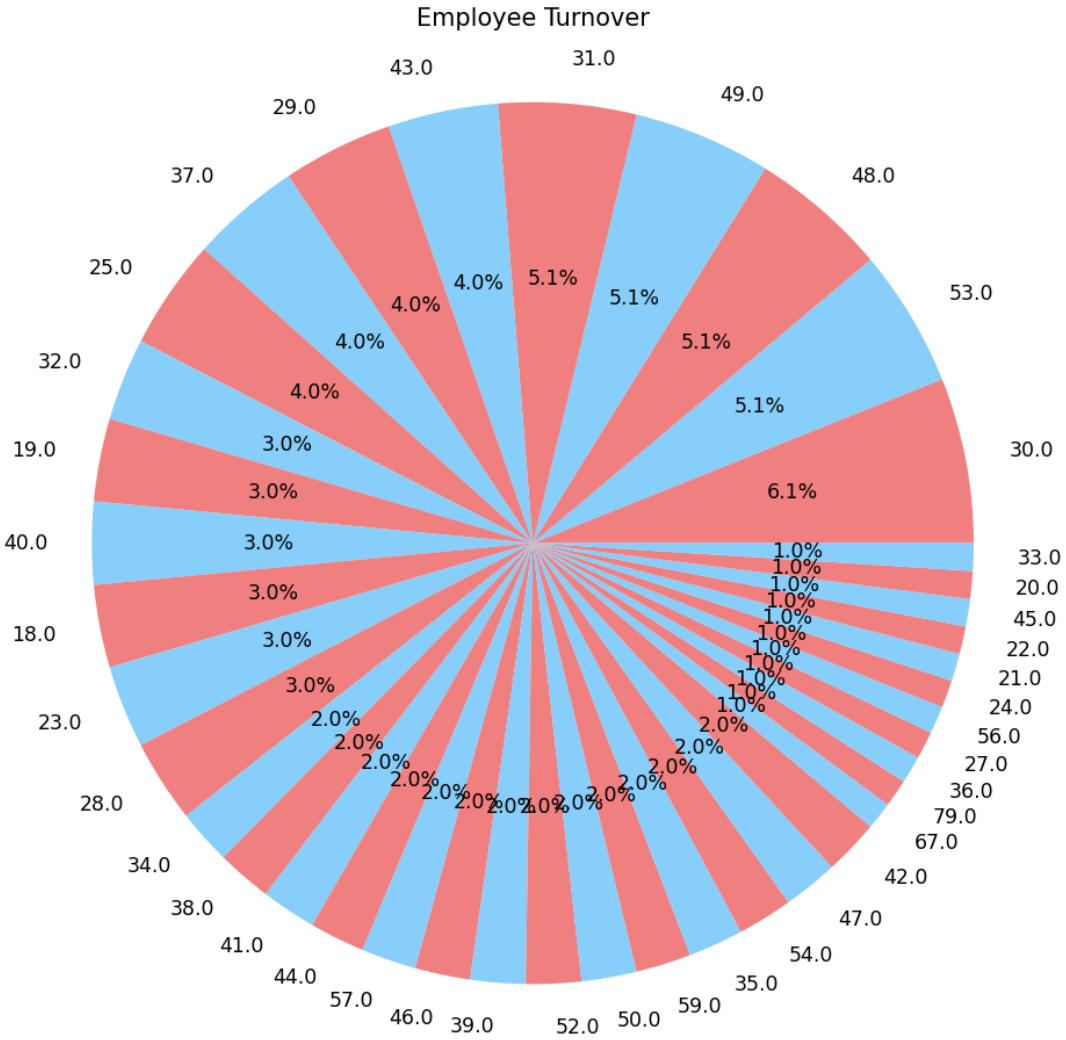



```
# Count plot to visualize the distribution of training hours
plt.figure(figsize=(10, 8))
sns.countplot(x='TrainingHours', data=hr_data, palette='pastel')
plt.title('Distribution of Training Hours')
plt.xlabel('Training Hours')
plt.ylabel('Count')
plt.show()
```



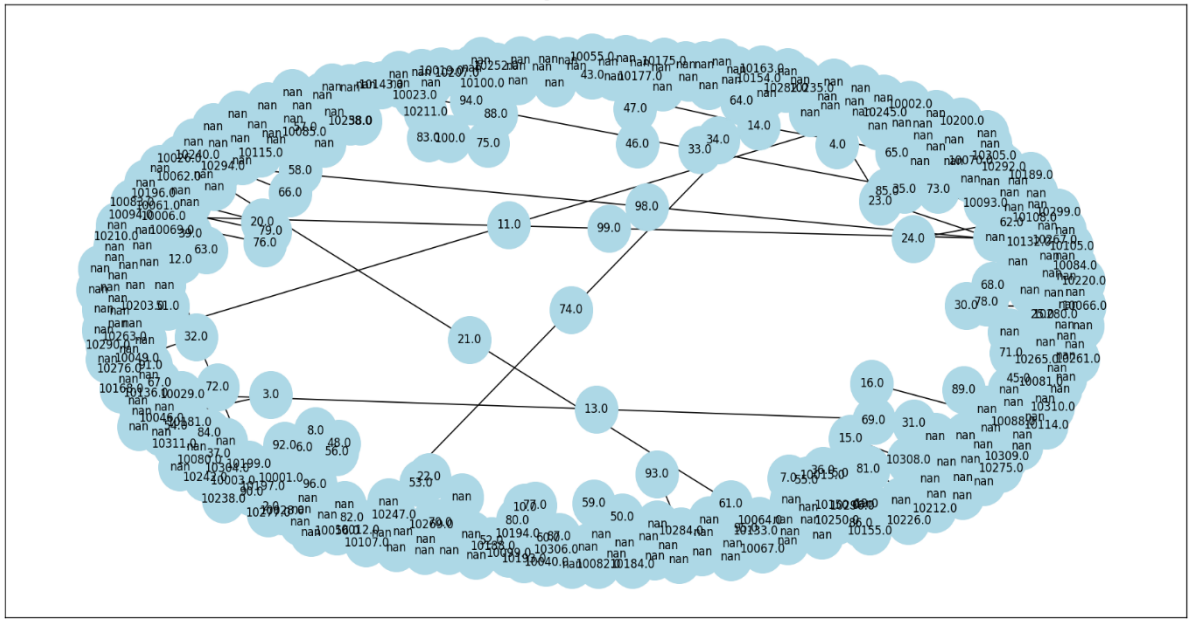
PIE CHART:

```
# Visualize employee turnover rates using a pie chart
plt.figure(figsize=(8, 8))
turnover_counts = hr_data['Turnover'].value_counts()
plt.pie(turnover_counts, labels=turnover_counts.index, autopct='%1.1f%%', colors=['lightcoral', 'lightskyblue'])
plt.title('Employee Turnover')
plt.axis('equal')
plt.tight_layout()
plt.show()
```



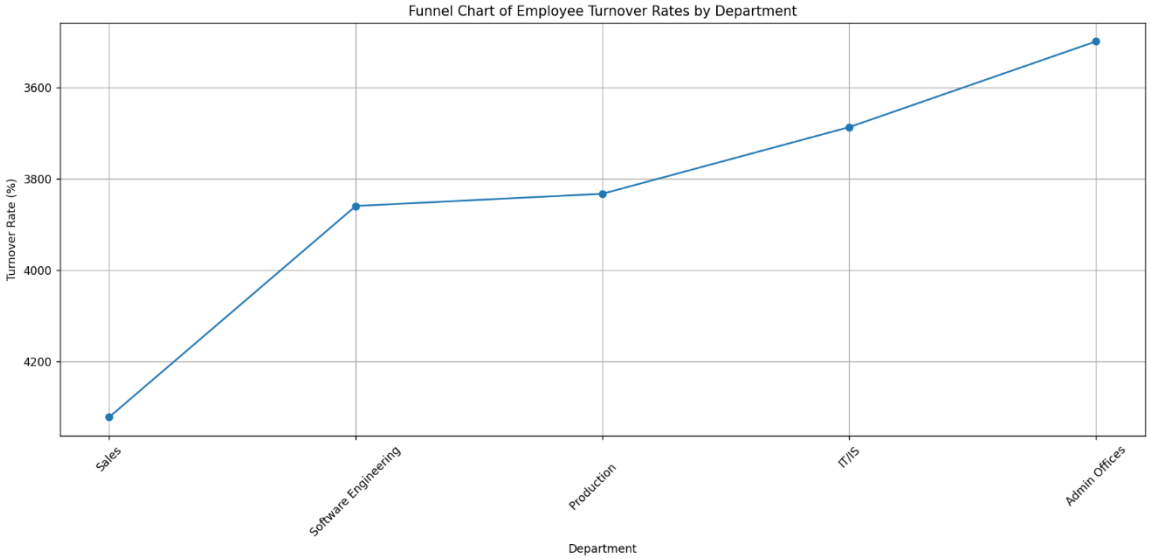
ORAGANIZATIONAL CHART

```
# Create an organizational chart to visualize reporting structures and departmental hierarchies
G = nx.DiGraph()
G.add_nodes_from(hr_data['EmpID'])
for _, row in hr_data.iterrows():
    if pd.notnull(row['ManagerID']):
        G.add_edge(row['ManagerID'], row['EmpID'])

# Visualize organizational chart using networkx
plt.figure(figsize=(12, 8))
pos = nx.spring_layout(G)
nx.draw_networkx(G, pos, with_labels=True, node_size=1500, node_color='lightblue', font_size=10, arrows=False)
plt.title('Organizational Chart')
plt.tight_layout()
plt.show()
```



FUNNEL CHART:

```
turnover_rates = hr_data.groupby('Department')['Turnover'].mean().sort_values(ascending=False)

# Visualize employee turnover rates using a funnel chart
plt.figure(figsize=(8, 6))
stages = turnover_rates.index
conversion_rates = turnover_rates.values * 100
plt.plot( *args: stages, conversion_rates, marker='o', linestyle='-')
plt.title('Funnel Chart of Employee Turnover Rates by Department')
plt.xlabel('Department')
plt.ylabel('Turnover Rate (%)')
plt.grid(True)
plt.gca().invert_yaxis()  # Invert y-axis to represent funnel shape
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



VIOLIN PLOT:

```
# Visualize employee turnover rates using a violin plot
plt.figure(figsize=(10, 6))
sns.violinplot                                                    data, palette='Set2')
plt.title('Vio                                                    Department')
plt.xlabel('Department')
plt.ylabel('Turnover Rate')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

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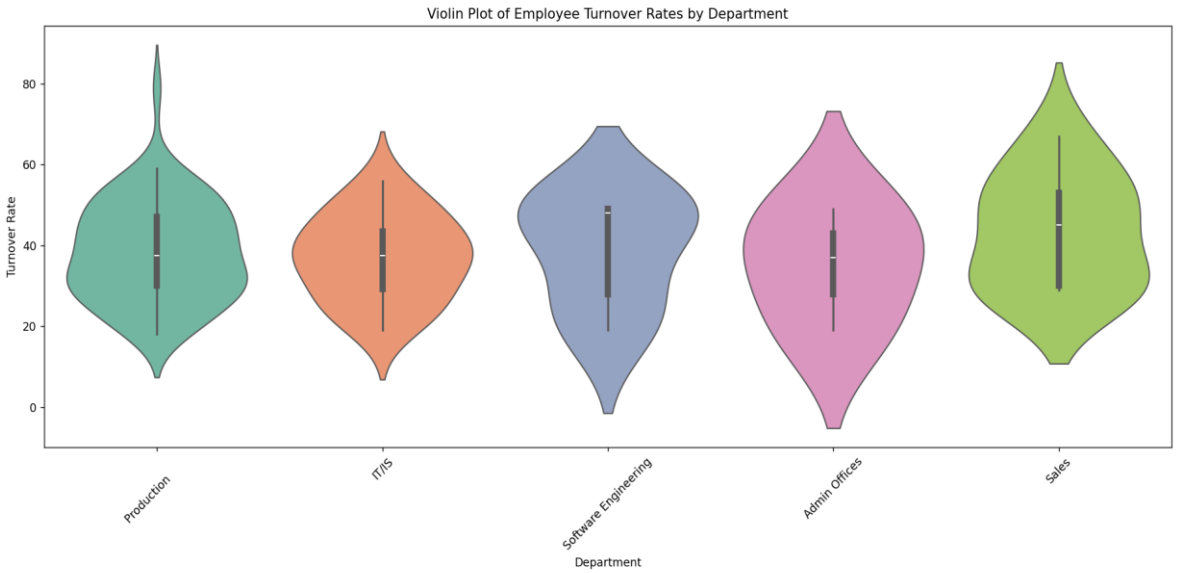


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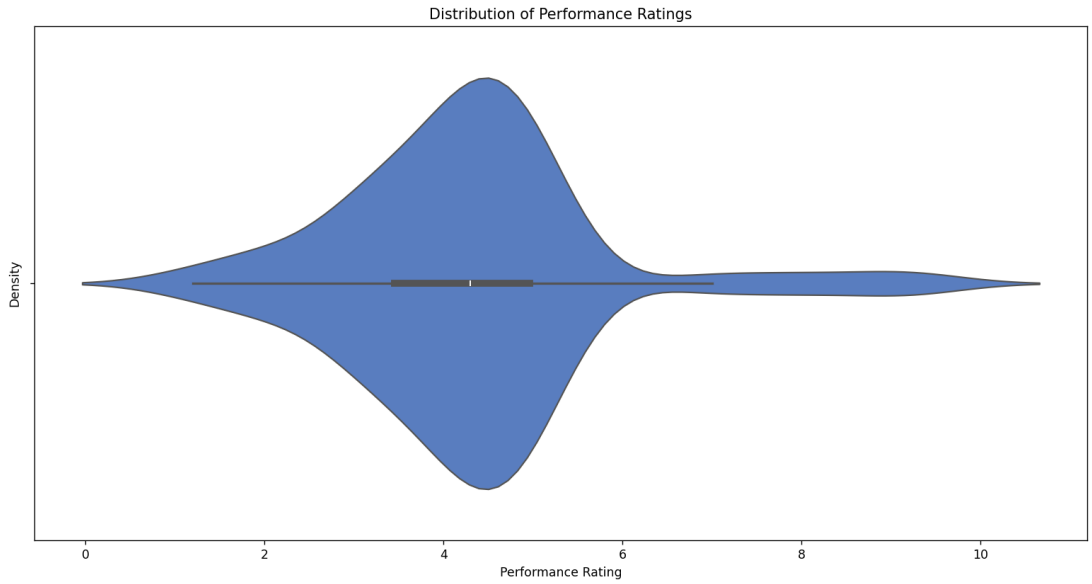

Github Link:

https://github.com/Balahari29/IBM-PROJECT.git

THANK YOU!