# DEPI HR Project Data Visualization Report

## 1. Count Plot of Employee Attrition

- **Purpose**: To visualize the distribution of employee attrition (Yes or No).
- **Insights**: This plot reveals the number of employees who left the company versus those who stayed. A significant difference in counts may indicate potential issues with retention that need further investigation.

## 2. Count Plot of Business Travel vs. Attrition

- **Purpose**: To analyze the relationship between business travel frequency and attrition rates.
- **Insights**: This visualization can show if frequent business travelers have a higher or lower attrition rate compared to non-travelers. Identifying patterns can help target interventions for at-risk groups.

## 3. Count Plot of Department vs. Attrition

- **Purpose**: To assess how attrition varies across different departments within the organization.
- **Insights**: Departments with higher attrition rates may require focused management strategies or resources to improve employee satisfaction and retention.

## 4. Count Plot of Education Field vs. Attrition

- **Purpose**: To examine attrition rates based on the employees' education fields.
- **Insights**: Variations in attrition by education field can indicate if certain educational backgrounds are more prone to leaving the company, guiding hiring or retention strategies.

## 5. Count Plot of Overtime vs. Attrition

- **Purpose**: To analyze the relationship between overtime work and attrition.

- **Insights**: Employees who frequently work overtime may show different attrition patterns, suggesting work-life balance concerns that could be addressed by management.

**6. Count Plot of Salary vs. Attrition**

- **Purpose**: To investigate how salary levels impact employee attrition.
- **Insights**: A correlation between lower salary brackets and higher attrition rates might highlight the need for salary reviews or adjustments to improve retention.

**7. Age Distribution Histogram**

- **Purpose**: To visualize the distribution of employee ages within the organization.
- **Insights**: The histogram can show age clustering, revealing if the workforce is skewed toward younger or older employees, which can influence company culture and benefits.

**8. Salary Distribution Histogram**

- **Purpose**: To assess the distribution of employee salaries.
- **Insights**: Understanding salary distribution helps identify wage disparities and informs compensation strategies.

**9. 2D Histogram of Age vs. Salary**

- **Purpose**: To explore the relationship between age and salary.
- **Insights**: This plot can indicate if younger employees tend to have lower salaries, suggesting potential entry-level positions or career progression needs.

**10. Box Plot of Years at Company**

- **Purpose**: To visualize the distribution and outliers of the number of years employees have been with the company.

- **Insights**: Identifying outliers can indicate unique employee experiences, while quartile analysis can reveal typical retention periods.

**11. Box Plot of Years Since Last Promotion**

- **Purpose**: To understand how long it takes employees to receive promotions.
- **Insights**: This plot can highlight promotion gaps, suggesting areas for improving employee growth and satisfaction.

**12. Count Plot of Employees by Department**

- **Purpose**: To display the distribution of employees across various departments.
- **Insights**: This visualization can help assess staffing levels and inform hiring decisions.

**13. Count Plot of Employees by Gender**

- **Purpose**: To analyze gender distribution in the workforce.
- **Insights**: Understanding gender representation can guide diversity and inclusion initiatives.

**14. 2D Histogram of Gender vs. Salary**

- **Purpose**: To examine how salary varies among different genders.
- **Insights**: Potential disparities in salary by gender can highlight areas needing policy review and adjustment.

**15. Scatter Plot of Age vs. Salary**

- **Purpose**: To analyze the relationship between age and salary through a scatter plot.
- **Insights**: This plot can indicate trends in salary increases with age, suggesting career progression pathways.

**16. Scatter Plot of Education vs. Salary**

- **Purpose**: To explore the correlation between education level and salary.
- **Insights**: Higher education levels may correlate with higher salaries, informing hiring and educational requirements for positions.

**17. Scatter Plot of Salary by Years at Company**

- **Purpose**: To assess how salary correlates with tenure at the company.
- **Insights**: Identifying trends can help in understanding employee retention and the impact of experience on compensation.

**18. Pair Plot of Numerical Features**

- **Purpose**: To visualize relationships between multiple numerical features in the dataset.
- **Insights**: This plot can reveal correlations, potential clustering, and the distribution of individual features, aiding in understanding the dataset's structure.

**19. Correlation Heatmap**

- **Purpose**: To visualize the correlation between numerical variables.
- **Insights**: Identifying strong correlations can guide feature selection and engineering in predictive modeling.

**20. Line Plot of Average Job Satisfaction Over Time**

- **Purpose**: To analyze how job satisfaction changes over time since hire.
- **Insights**: Trends in job satisfaction can help identify periods requiring management intervention or additional support.

**21. Scatter Plot of Age vs. Salary Colored by Attrition**

- **Purpose**: To explore the relationship between age, salary, and attrition visually.
- **Insights**: This plot can highlight patterns where younger employees with certain salaries are more likely to leave, informing retention strategies.

### 22. Bar Plot of Attrition by Gender

- **Purpose**: To compare attrition rates across different genders.
- **Insights**: Variations in attrition rates by gender can inform targeted initiatives to enhance employee satisfaction and retention.