

OESON PROJECT 2

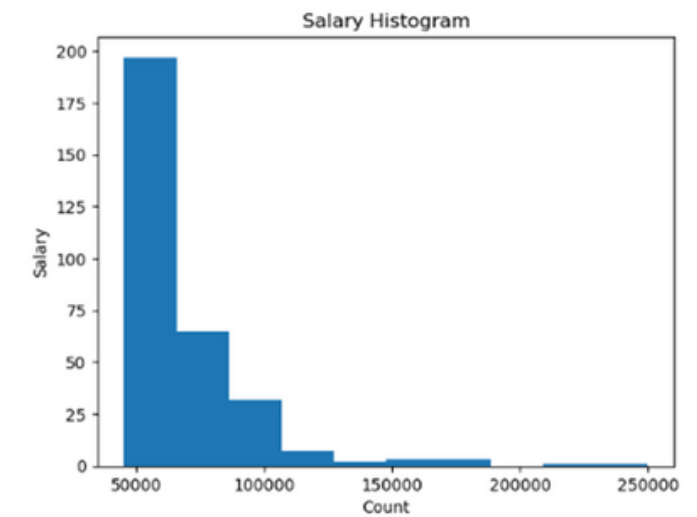
**HUMAN RESOURCES ANALYTICS
AND DATA VISUALISATION**

HUMAN RESOURCES DATASET

Rohit Sunku

PROJECT DESCRIPTION

A sample salary histogram showing the distribution of different salaries across the company.



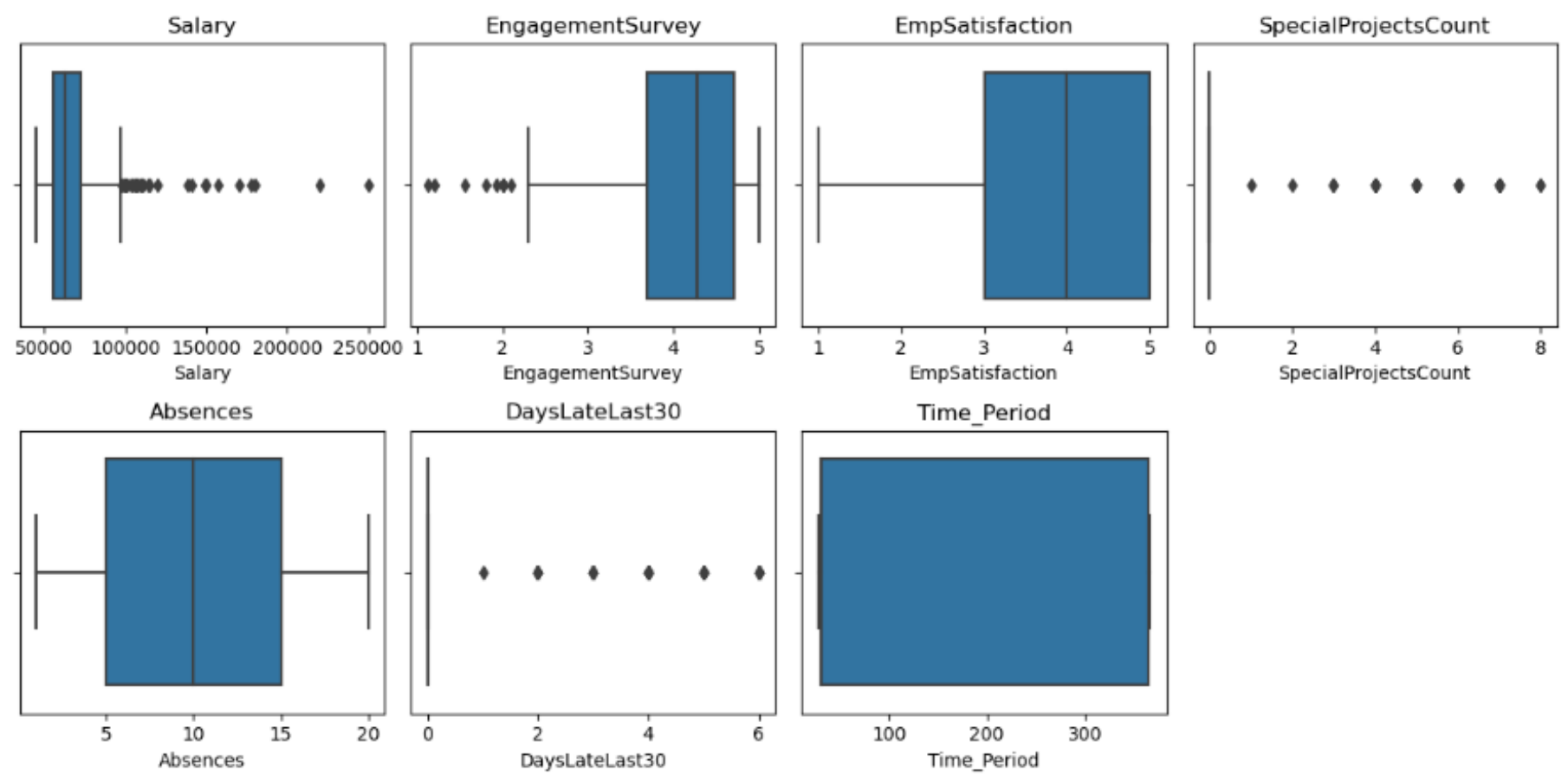
Project Task

1. Analyse a HR (Human Resources) Dataset including information about employees like ID, Designation, Performance Score, Salary etc.
2. Construct meaningful visualisations to derive patterns and trends from the data using matplotlib and seaborn libraries to showcase a comprehensive understanding within XYZ technologies.
3. Obtain information about the best employees, best managers, insights on how to build new models and provide a platform the company can use to evaluate their performance.
4. Report on inferences and insights gained from visualisations painting a clearer picture of organisational dynamics.
5. Finalise conclusions, provide recommendations and information on possible further work incentives.

DESCRIPTIVE STATISTICS OF DATASET

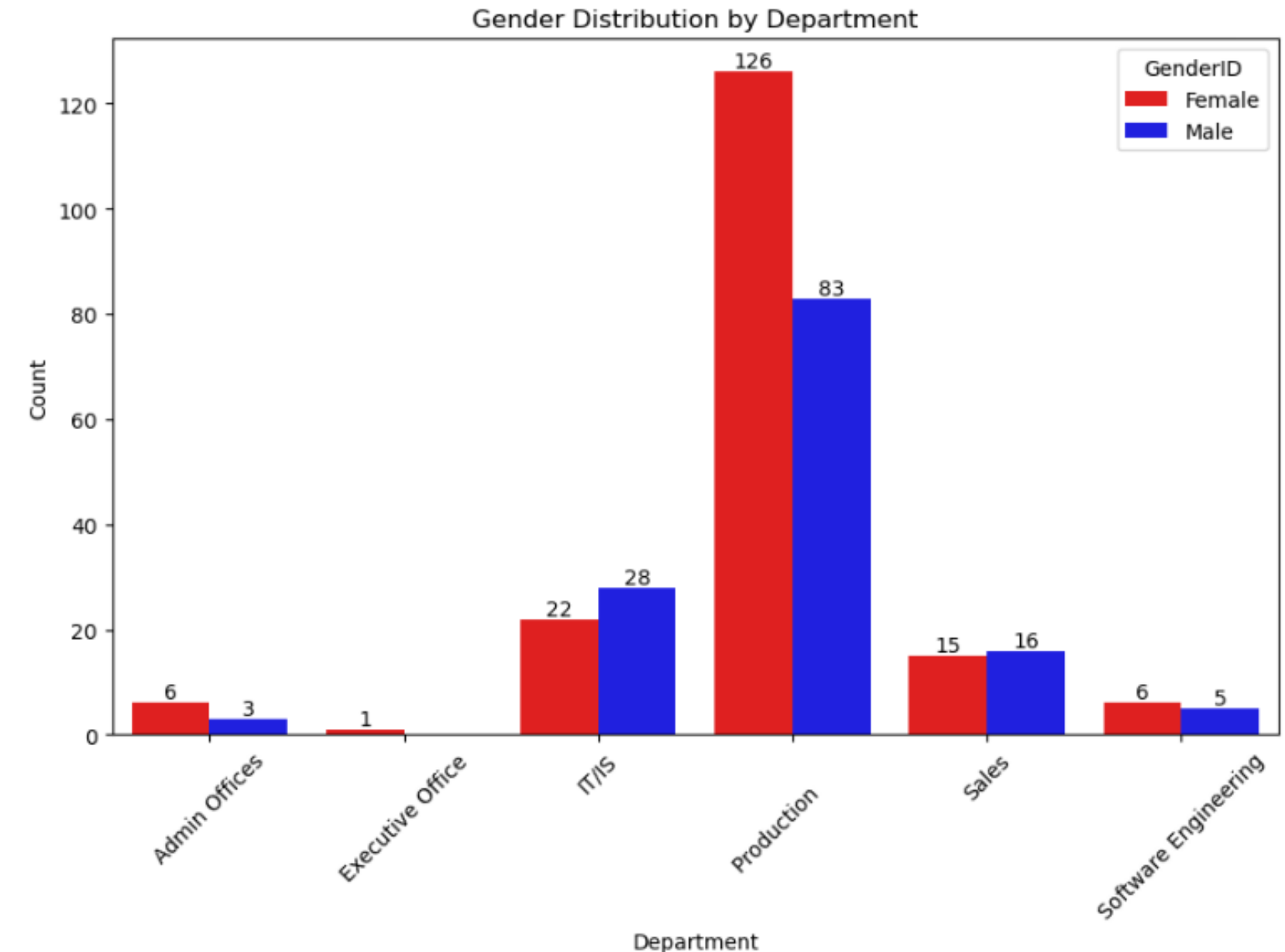
- **Salary:** There are a significant number of outliers within this set of data, with the upper quartile being at \$72, 036. The average salary is approximately \$69, 020, however there is a wide range, with the minimum salary being \$45. 046 and the maximum value being at \$250,000. The boxplot indicates there are a few salaries for higher positions which are significantly higher than the average but the rest of these are not.
- **Engagement Survey:** There are a few employees with a low engagement at 2/1. These employees need to be spoken to in terms of engagement.
- **Time Period:** This variable is associated with the amount of time each employee stays within the company. We can see the mean is 180 days, with the minimum tenancy being 28 days and the maximum tenancy being 366.
- **Absences:** The number of absences ranges from 1-20 with 10 being the average. Attendance is good overall, with only 10 absence days in total per year.

| | Salary | EngagementSurvey | EmpSatisfaction | SpecialProjectsCount | Absences | DaysLateLast30 | Time_Period |
|-------|---------------|------------------|-----------------|----------------------|------------|----------------|-------------|
| count | 311.000000 | 311.000000 | 311.000000 | 311.000000 | 311.000000 | 311.000000 | 311.000000 |
| mean | 69020.684887 | 4.110000 | 3.890675 | 1.218650 | 10.237942 | 0.414791 | 180.099678 |
| std | 25156.636930 | 0.789938 | 0.909241 | 2.349421 | 5.852596 | 1.294519 | 166.531717 |
| min | 45046.000000 | 1.120000 | 1.000000 | 0.000000 | 1.000000 | 0.000000 | 28.000000 |
| 25% | 55501.500000 | 3.690000 | 3.000000 | 0.000000 | 5.000000 | 0.000000 | 31.000000 |
| 50% | 62810.000000 | 4.280000 | 4.000000 | 0.000000 | 10.000000 | 0.000000 | 31.000000 |
| 75% | 72036.000000 | 4.700000 | 5.000000 | 0.000000 | 15.000000 | 0.000000 | 365.000000 |
| max | 250000.000000 | 5.000000 | 5.000000 | 8.000000 | 20.000000 | 6.000000 | 366.000000 |



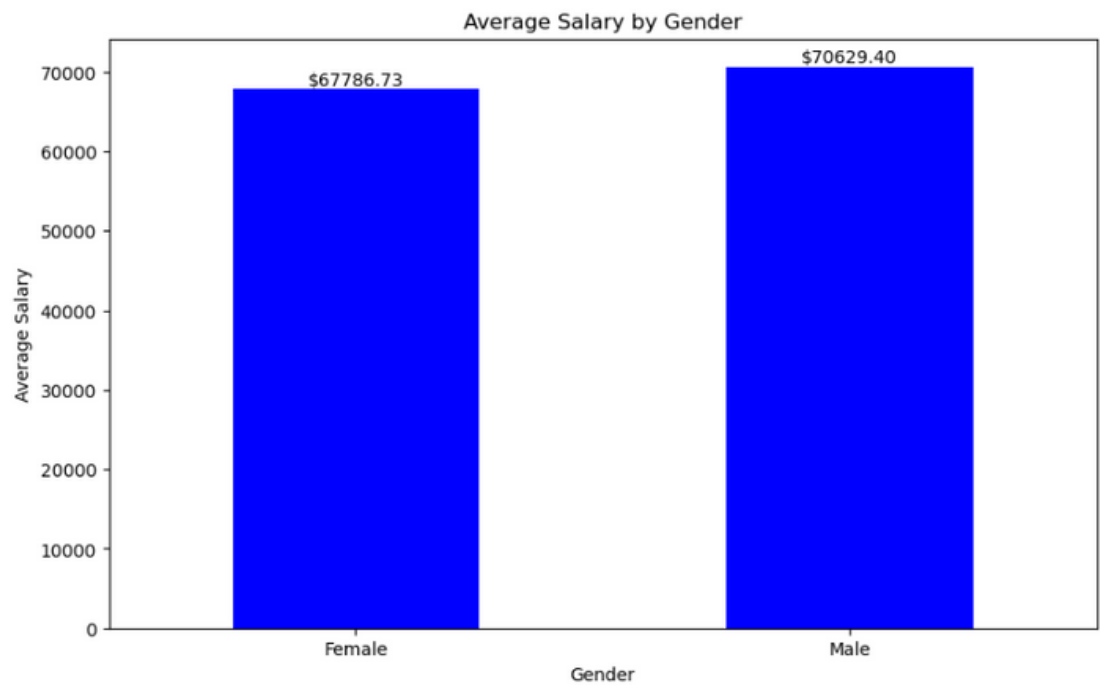
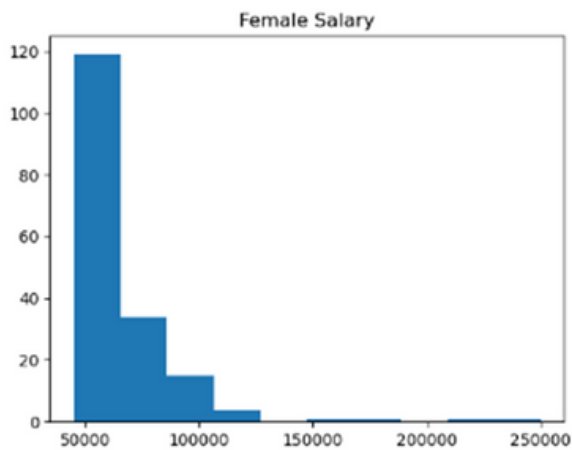
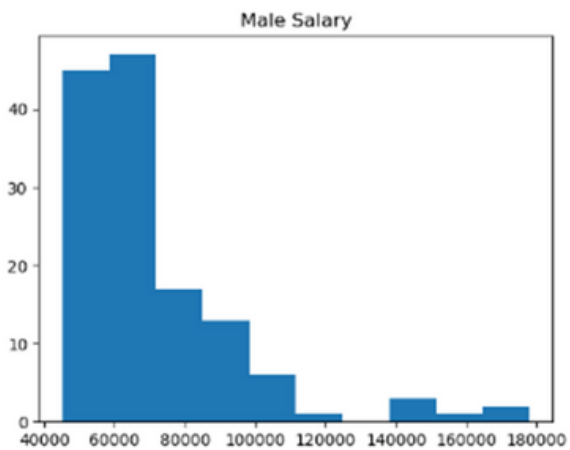
GENDER DISTRIBUTION BY DEPARTMENT

- **Department Gender Diversity (Unequal):** IT department is slightly male dominated, with 28 males and 22 females. On the other hand, we see that the Production department is dominated more by females, which comes to a surprise, as males tend to dominate primary sectors.
- **Department Gender Diversity (Unequal):** Administration Offices and Executive Offices have seen a higher number of females.
- **Department Gender Diversity (Equal):** The Sales and Software Engineering departments exhibit more balance within their gender ratios.



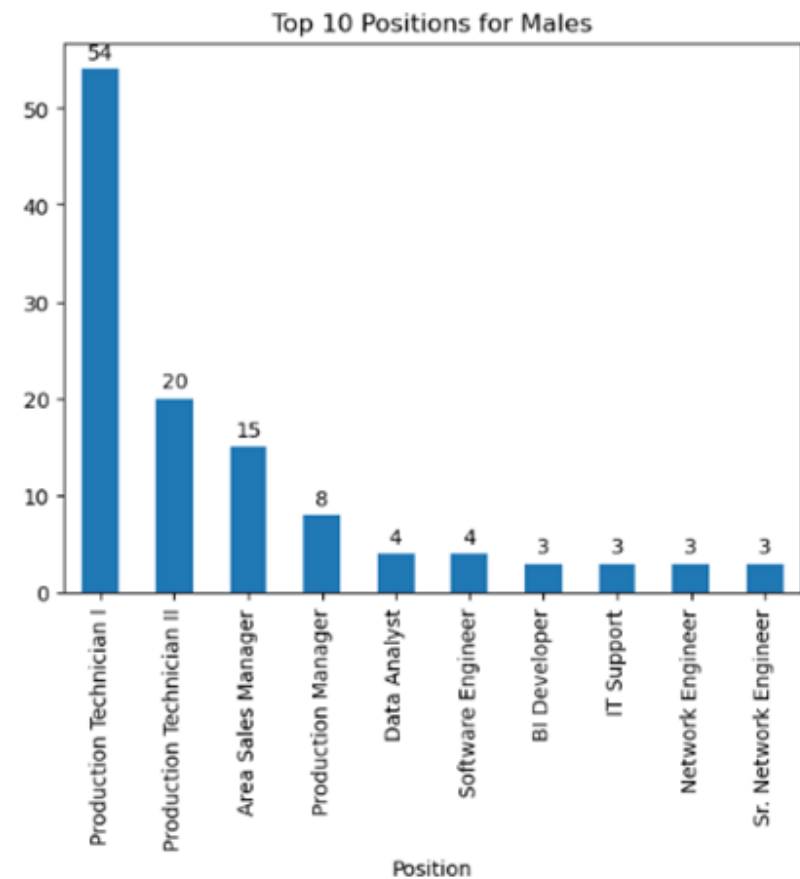
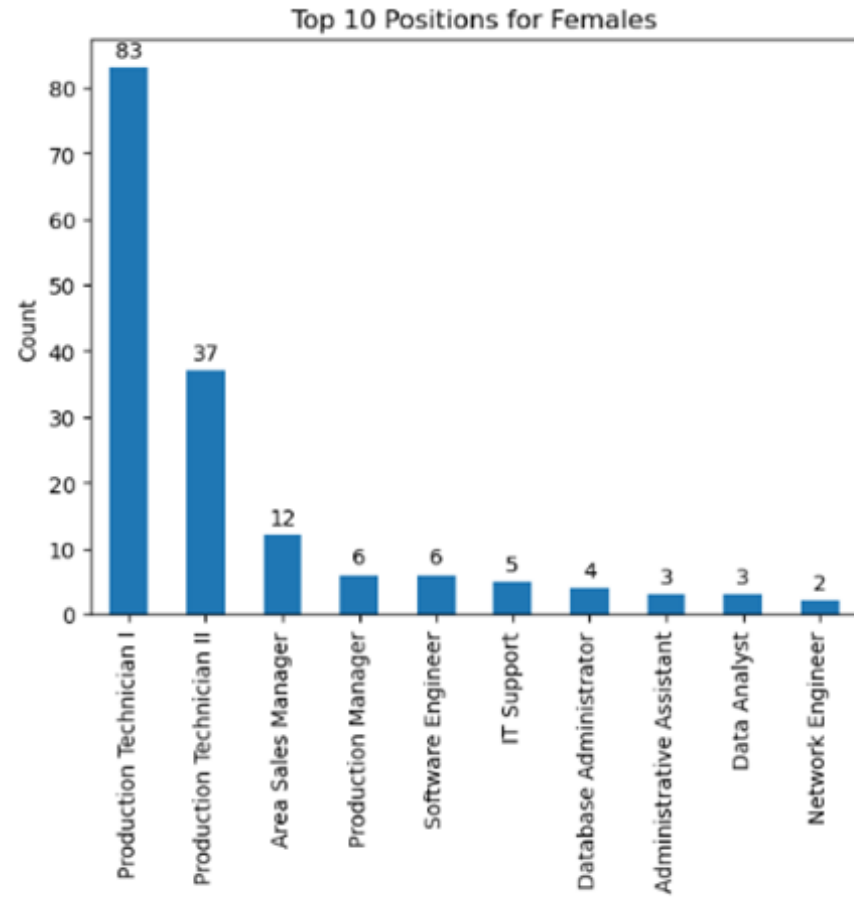
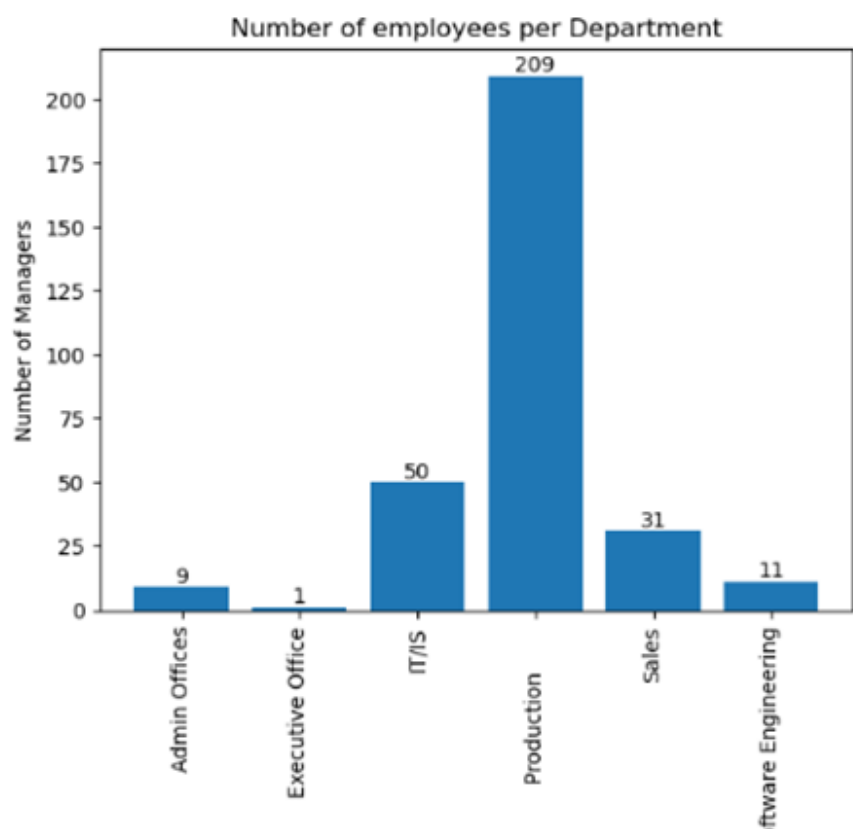
GENDER ANALYSIS

- We can see that on average, males have a higher salary \$70629 in comparison with \$67786 which is the female salary. This is a cause for concern in gender equality, although this slight difference can be justified by there being 23 males in managerial positions compares to 18 females. There are more females than males within this company which suggests why their average is lower.
- The male salary maximum and minimum values are lower, with a female being the CEO earning \$250, 000, then the CIO earning \$220, 450 too. The Director of Sales is a male at \$180, 000 and the IT Director is \$178, 000, with the Director of Operations being \$170, 500.
- The top 3 most well paid positions are taken up by females. We can see that on average, the distribution of males and females in top paid professions is roughly the same, however as we down the table, there is a much higher proportion of females working as Product Technicians.
- We can use this data to understand salary distribution across different genders, and minimise the gender pay gap.

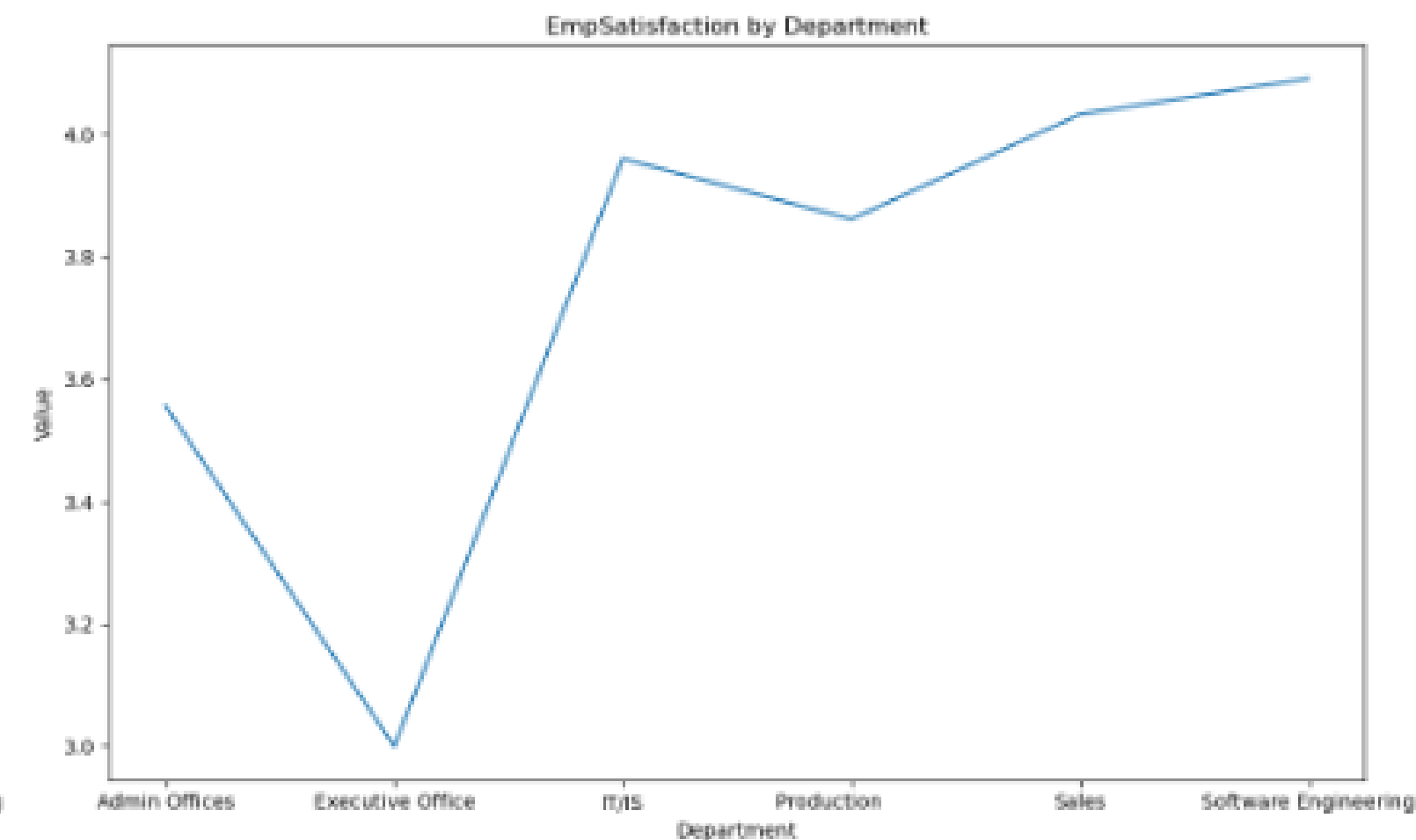
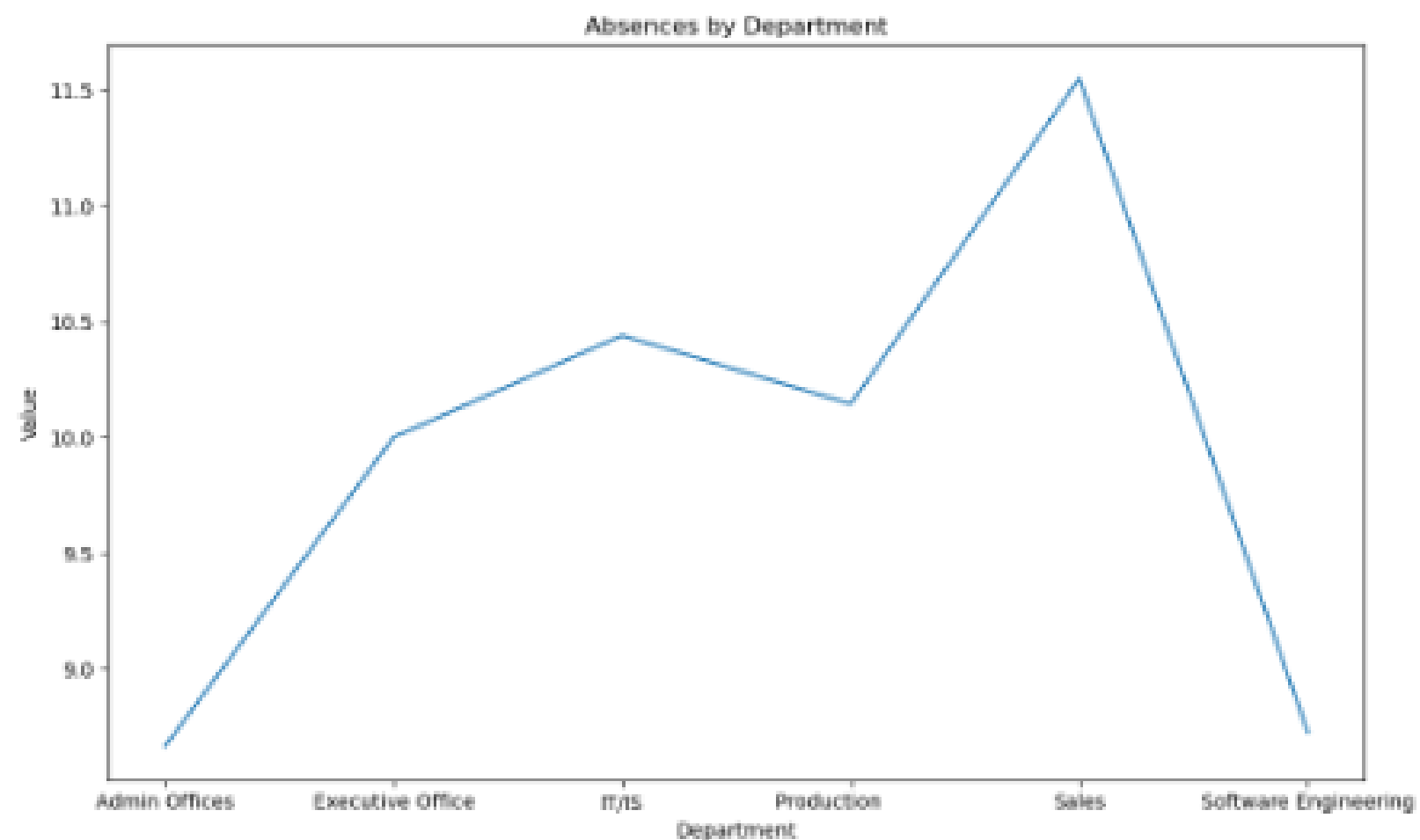
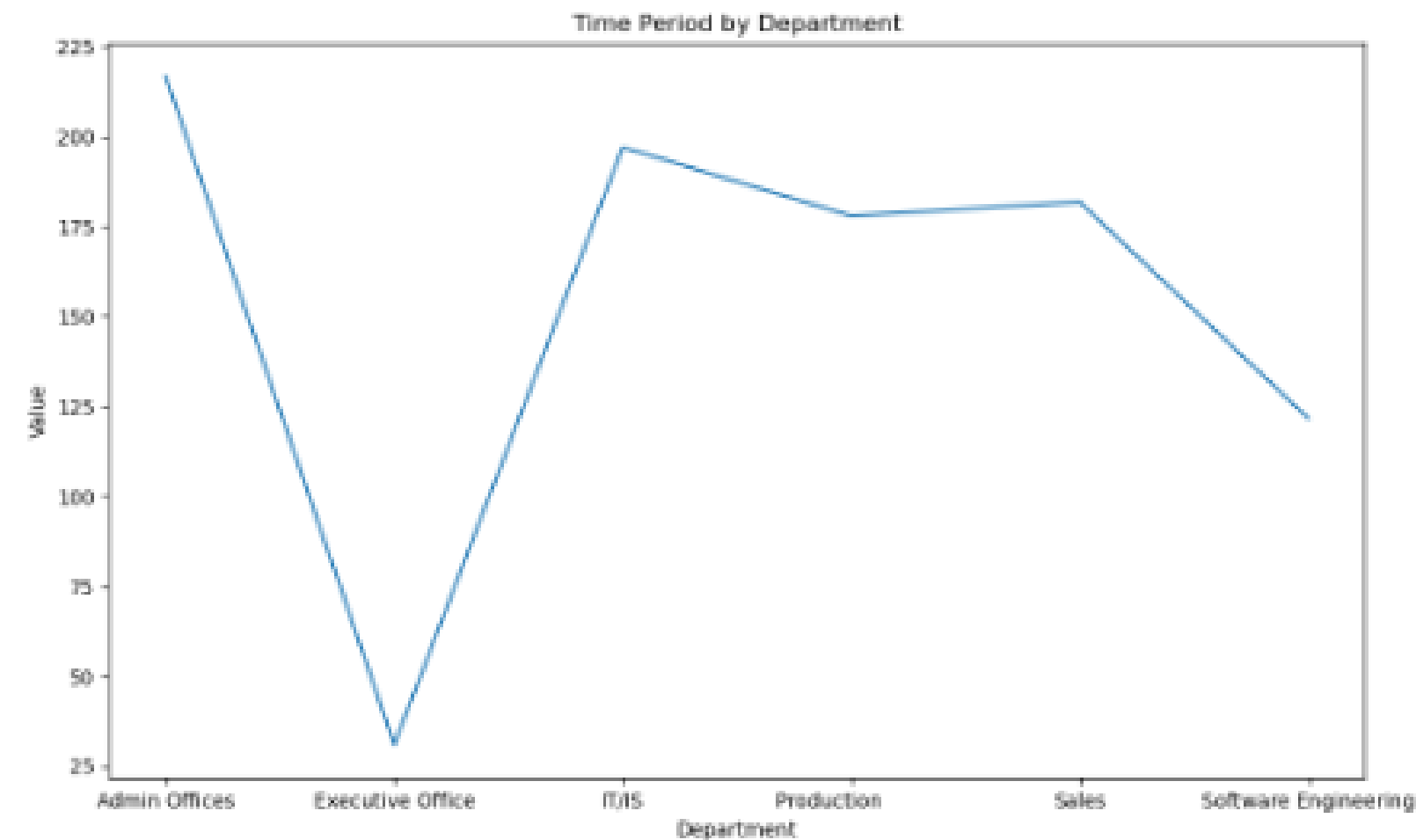
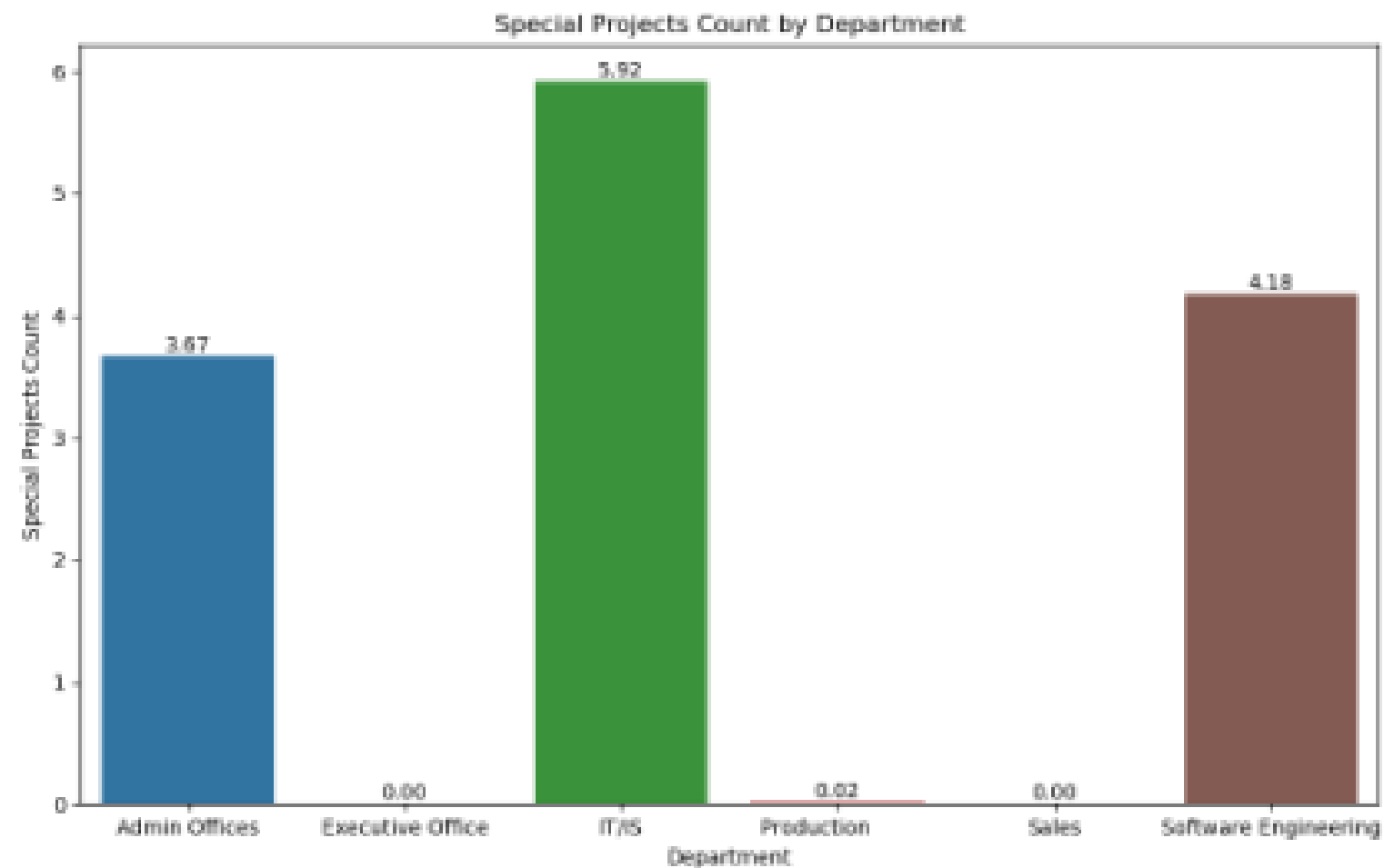


| | Position | Salary | Female_Count | Male_Count |
|----|------------------------------|---------------|--------------|------------|
| 26 | President & CEO | 250000.000000 | 1.0 | NaN |
| 8 | CIO | 220450.000000 | 1.0 | NaN |
| 16 | Director of Sales | 180000.000000 | 1.0 | NaN |
| 18 | IT Director | 178000.000000 | NaN | 1.0 |
| 15 | Director of Operations | 170500.000000 | NaN | 1.0 |
| 20 | IT Manager - Infra | 157000.000000 | NaN | 1.0 |
| 12 | Data Architect | 150290.000000 | 1.0 | NaN |
| 19 | IT Manager - DB | 144959.500000 | NaN | 2.0 |
| 21 | IT Manager - Support | 138888.000000 | NaN | 1.0 |
| 27 | Principal Data Architect | 120000.000000 | 1.0 | NaN |
| 14 | Database Administrator | 113999.000000 | 4.0 | 1.0 |
| 7 | BI Director | 110929.000000 | NaN | 1.0 |
| 13 | Database Administrator | 107124.750000 | 4.0 | 1.0 |
| 44 | Sr. DBA | 104437.000000 | 1.0 | 1.0 |
| 17 | Enterprise Architect | 103613.000000 | NaN | 1.0 |
| 42 | Sr. Accountant | 102859.000000 | 2.0 | NaN |
| 43 | Sr. DBA | 100031.000000 | 1.0 | 1.0 |
| 39 | Software Engineer | 98908.166667 | 6.0 | 4.0 |
| 40 | Software Engineer | 98438.750000 | 6.0 | 4.0 |
| 45 | Sr. Network Engineer | 98127.000000 | 2.0 | 3.0 |
| 5 | BI Developer | 95920.000000 | 1.0 | 3.0 |
| 6 | BI Developer | 95313.333333 | 1.0 | 3.0 |
| 38 | Shared Services Manager | 93046.000000 | NaN | 1.0 |
| 46 | Sr. Network Engineer | 91033.333333 | 2.0 | 3.0 |
| 9 | Data Analyst | 90909.666667 | 3.0 | 4.0 |
| 10 | Data Analyst | 89199.750000 | 3.0 | 4.0 |
| 11 | Data Analyst | 88527.000000 | NaN | 1.0 |
| 37 | Senior BI Developer | 88412.000000 | 1.0 | 2.0 |
| 36 | Senior BI Developer | 81584.000000 | 1.0 | 2.0 |
| 41 | Software Engineering Manager | 77692.000000 | NaN | 1.0 |
| 29 | Production Manager | 77055.375000 | 6.0 | 8.0 |
| 35 | Sales Manager | 72992.000000 | 2.0 | 1.0 |
| 28 | Production Manager | 72946.666667 | 6.0 | 8.0 |
| 25 | Network Engineer | 68225.333333 | 2.0 | 3.0 |
| 34 | Sales Manager | 67364.000000 | 2.0 | 1.0 |
| 4 | Area Sales Manager | 65843.800000 | 12.0 | 15.0 |
| 32 | Production Technician II | 65397.891892 | 37.0 | 20.0 |
| 23 | IT Support | 64511.666667 | 5.0 | 3.0 |
| 33 | Production Technician II | 63956.700000 | 37.0 | 20.0 |
| 3 | Area Sales Manager | 63793.500000 | 12.0 | 15.0 |
| 1 | Accountant I | 63761.500000 | 1.0 | 2.0 |
| 22 | IT Support | 63188.000000 | 5.0 | 3.0 |
| 0 | Accountant I | 63000.000000 | 1.0 | 2.0 |
| 30 | Production Technician I | 56081.578313 | 83.0 | 54.0 |

- From this data, we can observe the Gender Split across all professions. Network Engineers get paid the least on average (\$51.6k) whereas the President & CEO gets paid the most at (\$250k).
- Managerial Positions are paid higher on average than regular workers, however software engineer managers are paid less sometimes than software engineers, perhaps because managing workers is easier than doing the work itself
- Principal Data Architects get paid less than Data Architects, which can suggest potential errors, since Principal Data Architects should be paid more. We can see Senior Database Administrators getting paid less than Standard Database Administrators.
- Furthermore, we see two female senior accountants getting paid roughly \$102k to handle the financial aspects of the company.
- The top position is “Production Technician 1” for both males and females followed by “Production Technician 2” and then “Area Sales Manager”. There are a higher number of male data analysts and BI developers but a higher number of female software engineers, production managers and database administrators.
- We can use this data to consider new strategies in equal pay and reconsider the company’s salary scheme.



| | Position | Salary | Female_Count | Male_Count |
|----|------------------------------|---------------|--------------|------------|
| 26 | President & CEO | 250000.000000 | 1.0 | NaN |
| 8 | CIO | 220450.000000 | 1.0 | NaN |
| 16 | Director of Sales | 180000.000000 | 1.0 | NaN |
| 18 | IT Director | 178000.000000 | NaN | 1.0 |
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| 20 | IT Manager - Infra | 157000.000000 | NaN | 1.0 |
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| 19 | IT Manager - DB | 144959.500000 | NaN | 2.0 |
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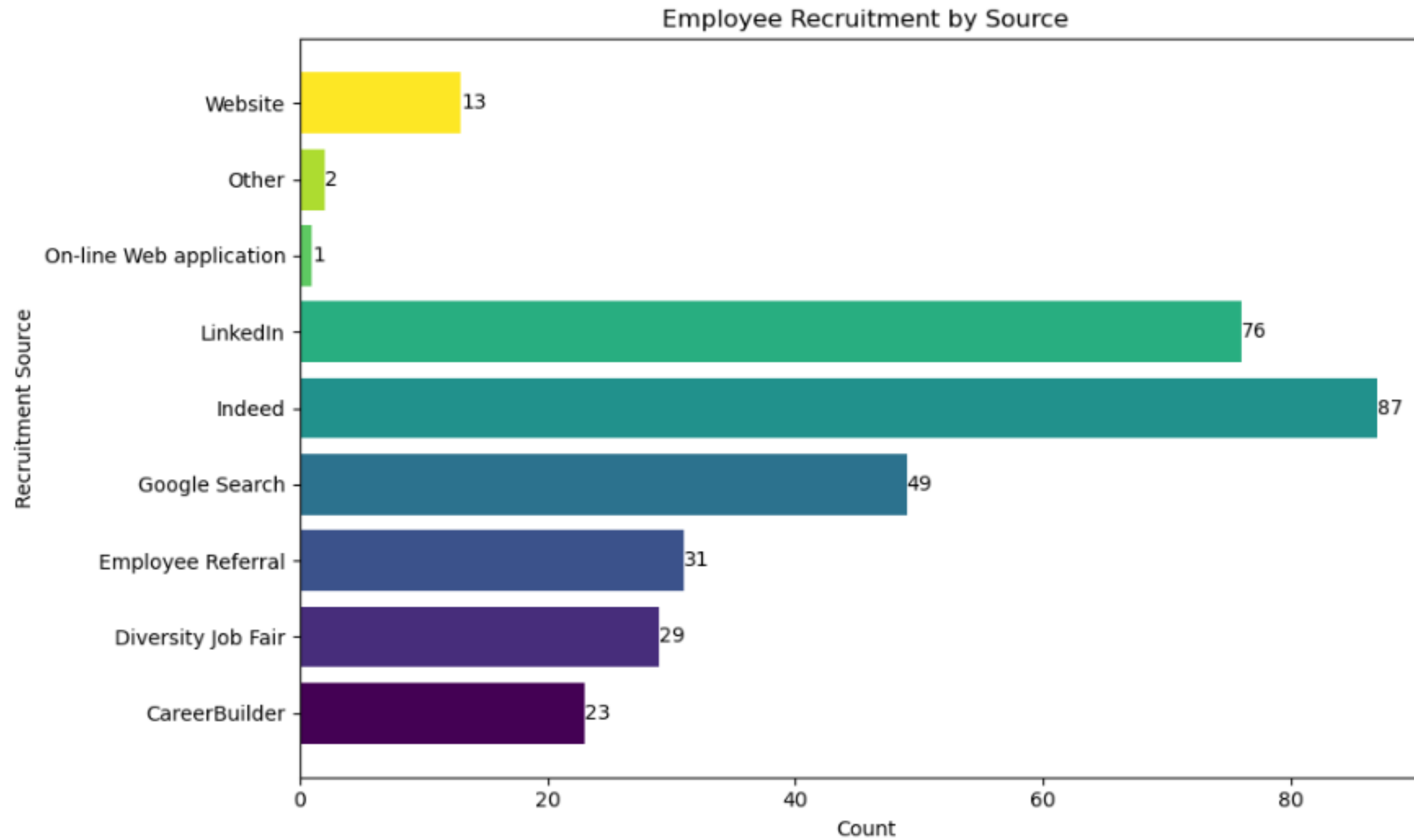


ANALYSING DEPARTMENT PERFORMANCE

- **Special Projects Count by Department:** The IT/IS department has the highest average number of special projects at approximately 6, followed by the Software Engineering Department at slightly higher than 4, then the Administration Office. Production, Sales and Executive Department employees do not participate/ participate minimally in these projects. Delegating more special projects to these departments would increase efficiency, involvement and employee engagement.
- **Time Period by Department:** Administration Offices has the highest average tenure, followed by IT/IS, Production, Sales and then Software Engineering. One member left the executive office at a very low tenure, however it is important to account this result only accounts for one employee and is not a very good representation of the department.
- **Absences by Department:** The Sales department has the highest number of absences on average, and this needs to be addressed. The IT/IS and Production departments average at 10 absences, with Software Engineers obtaining the best track record the lowest recorded average absences.
- **Employee Satisfaction by Department:** There is a cause for concern within the Executive Office department; an average value below 3 for employee satisfaction needs to be considered. Software Engineers are the happiest within this company.

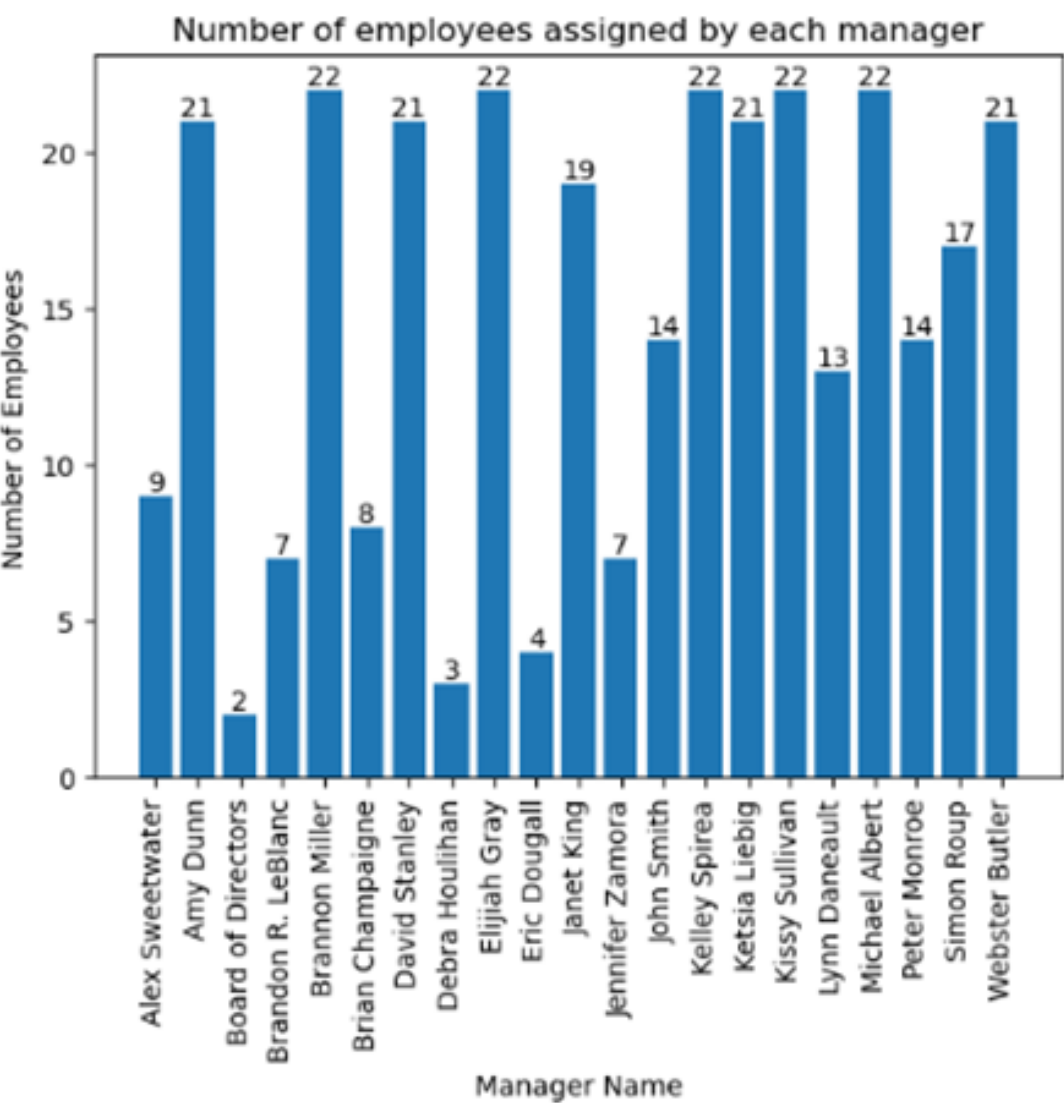
This data can be used to assess different departments, help delegate the workload and introduce schemes to motivate workers.

EMPLOYEE RECRUITMENT BY SOURCE



MANAGER ANALYSIS

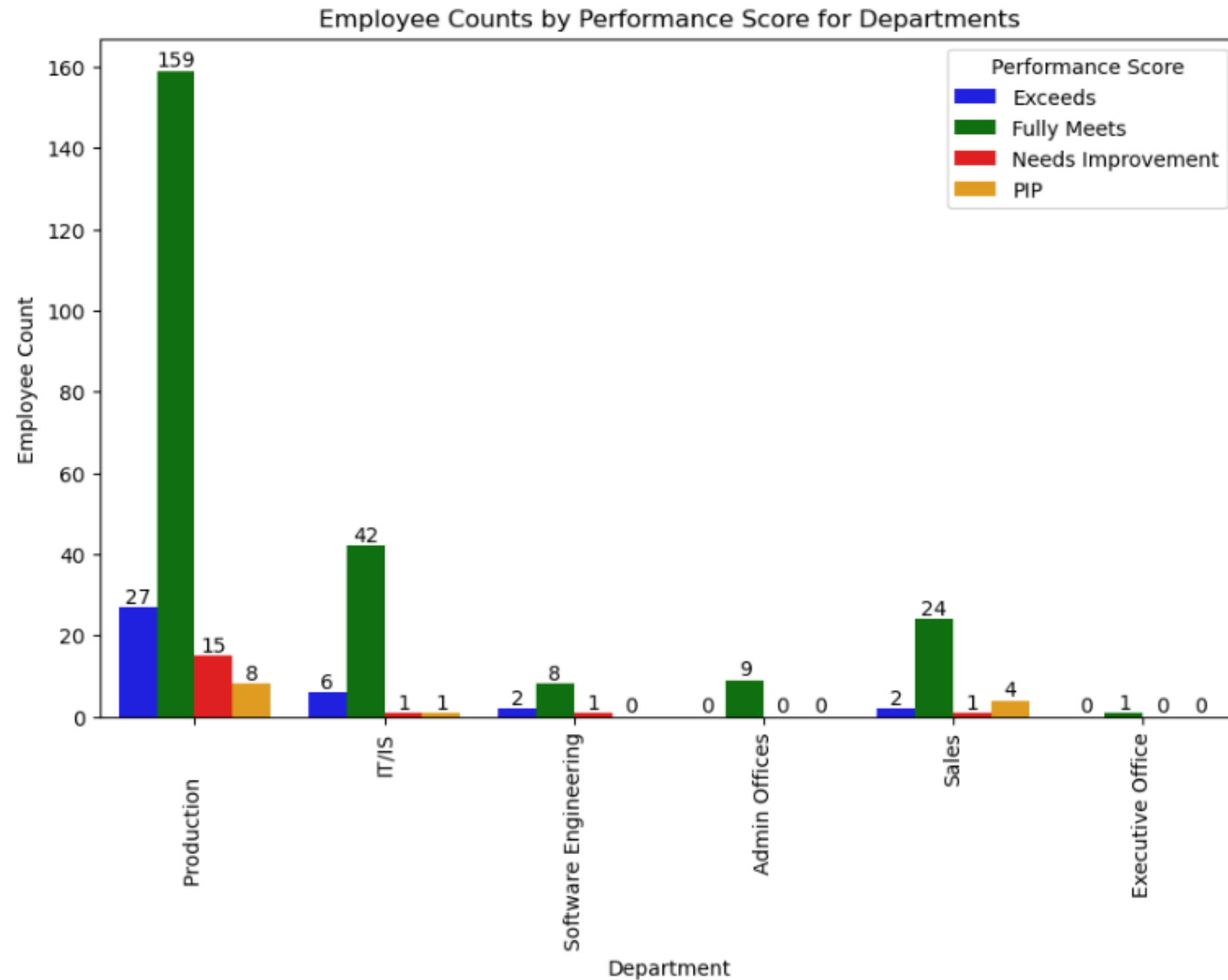
- The highest number of employees managed by a manager is 22. There are 6 managers that have reached full capacity, they are Brannon Miller, Elijah Gray, Kelley Spirea, Kissy Sullivan and Michael Albert. Other than the Board of Directors, Debra Houlihan, Eric Dougall, Brandon R Leblanc should be prioritised first within their department as a new employee manager.
- **Engagement:** Eric Dougall has the highest engagement at 4.59 indicating high performance within his role. However, his employment satisfaction is low, which indicates the company should communicate and address any issues. Brandon R. Leblanc and David Stanley.
- **Employment Satisfaction:** Debra Houlihan has the highest employment satisfaction, however she only manages 3 employees. Debra Houlihan and Eric Dougall’s results suggest that working in smaller teams might be better. Alex Sweetwater finishes 2nd, and is the only manager with an engagement and employee satisfaction above 4.0.
- This data can be used to reward managers, increasing their employment satisfaction, improve employee allocation and build models to track managerial performance.



| | ManagerName | ManagerID | EngagementSurvey |
|---|--------------------|-----------|------------------|
| 2 | Board of Directors | 9 | 4.915000 |
| 9 | Eric Dougall | 6 | 4.585000 |
| 3 | Brandon R. LeBlanc | 1 | 4.348571 |
| 6 | David Stanley | 14 | 4.150952 |
| 0 | Alex Sweetwater | 10 | 4.076667 |
| 8 | Elijah Gray | 16 | 4.074545 |
| 5 | Brian Champaigne | 13 | 4.058750 |
| 4 | Brannon Miller | 12 | 4.041818 |
| 1 | Amy Dunn | 11 | 3.924762 |
| 7 | Debra Houlihan | 15 | 3.840000 |

| | ManagerName | ManagerID | EmpSatisfaction |
|---|--------------------|-----------|-----------------|
| 7 | Debra Houlihan | 15 | 4.333333 |
| 0 | Alex Sweetwater | 10 | 4.222222 |
| 5 | Brian Champaigne | 13 | 4.000000 |
| 8 | Elijah Gray | 16 | 3.954545 |
| 6 | David Stanley | 14 | 3.952381 |
| 1 | Amy Dunn | 11 | 3.809524 |
| 3 | Brandon R. LeBlanc | 1 | 3.571429 |
| 9 | Eric Dougall | 6 | 3.500000 |
| 4 | Brannon Miller | 12 | 3.409091 |
| 2 | Board of Directors | 9 | 3.000000 |

PERFORMANCE SCORES ACROSS DEPARTMENTS



- Sales has the highest number of PIP Performance Scores, and a small number of Exceeds expectations. This department perhaps may need to look at re-organisation and a new managerial scheme, if not a new manager itself.
- Majority of the employees that need improvement exist within the Production Area.

EMPLOYEE ANALYSIS

- We look at the employees which exceed expectations in terms of performance within each department. We can see none of them have been late within the last 30 days.
- **Best Employees:** Michael Albert stands out, with the highest employment score, and lowest number of absences within the Production department. Similarly, Andrew Szabo is the employee with the smallest number of absences at 1 within the Software Engineering department.
- **Terminated Contracts:** Reasons why people have terminated their working contract are to do with inadequate pay, therefore XYZ should consider increasing their pay for employees within Production roles.
- We can use this data to target employees with reward schemes and increase their engagement and satisfaction. Moreover, we can analyse Term Reasons to consider new ways to reduce our turnover rate.

| | Department | Employee_Name | EmpID | PerformanceScore | EmpSatisfaction | ManagerName | TermReason | DaysLateLast30 | Absences |
|-----|------------|--------------------|-------|------------------|-----------------|----------------|----------------------------------|----------------|----------|
| 0 | Production | Adinolfi, Wilson K | 10026 | Exceeds | 5 | Michael Albert | N/A-StillEmployed | 0 | 1 |
| 5 | Production | Anderson, Linda | 10002 | Exceeds | 5 | Amy Dunn | N/A-StillEmployed | 0 | 15 |
| 16 | Production | Beak, Kimberly | 10023 | Exceeds | 3 | Kelley Spirea | N/A-StillEmployed | 0 | 16 |
| 22 | Production | Billis, Helen | 10003 | Exceeds | 3 | Brannon Miller | N/A-StillEmployed | 0 | 19 |
| 36 | Production | Candie, Calvin | 10001 | Exceeds | 3 | Janet King | N/A-StillEmployed | 0 | 14 |
| 51 | Production | Clukey, Eljian | 10029 | Exceeds | 4 | Brannon Miller | N/A-StillEmployed | 0 | 5 |
| 55 | Production | Corleone, Vito | 10019 | Exceeds | 5 | Janet King | N/A-StillEmployed | 0 | 15 |
| 106 | Production | Girifalco, Evelyn | 10018 | Exceeds | 4 | Amy Dunn | N/A-StillEmployed | 0 | 3 |
| 111 | Production | Gonzalez, Cayo | 10031 | Exceeds | 4 | Brannon Miller | N/A-StillEmployed | 0 | 1 |
| 125 | Production | Harrison, Kara | 10007 | Exceeds | 4 | Amy Dunn | N/A-StillEmployed | 0 | 5 |
| 141 | Production | Jeannite, Tayana | 10009 | Exceeds | 4 | Ketsia Liebig | N/A-StillEmployed | 0 | 11 |
| 143 | Production | Johnson, George | 10034 | Exceeds | 4 | Michael Albert | more money | 0 | 9 |
| 145 | Production | Johnston, Yen | 10036 | Exceeds | 3 | Brannon Miller | N/A-StillEmployed | 0 | 1 |
| 167 | Production | Liebig, Ketsia | 10017 | Exceeds | 3 | Janet King | N/A-StillEmployed | 0 | 11 |
| 172 | Production | Lunquist, Lisa | 10035 | Exceeds | 4 | Elijah Gray | N/A-StillEmployed | 0 | 19 |
| 174 | Production | Lynch, Lindsay | 10004 | Exceeds | 4 | Webster Butler | Another position | 0 | 17 |
| 191 | Production | Monterro, Luisa | 10025 | Exceeds | 3 | Kissy Sullivan | N/A-StillEmployed | 0 | 1 |
| 201 | Production | Ngodup, Shari | 10037 | Exceeds | 3 | Brannon Miller | N/A-StillEmployed | 0 | 12 |
| 208 | Production | Osturnka, Adeel | 10021 | Exceeds | 3 | Kelley Spirea | N/A-StillEmployed | 0 | 13 |
| 217 | Production | Peters, Lauren | 10032 | Exceeds | 5 | Ketsia Liebig | more money | 0 | 12 |
| 232 | Production | Rivera, Haley | 10011 | Exceeds | 5 | Webster Butler | N/A-StillEmployed | 0 | 16 |
| 237 | Production | Robinson, Elias | 10020 | Exceeds | 5 | Brannon Miller | N/A-StillEmployed | 0 | 4 |
| 257 | Production | Smith, Joe | 10027 | Exceeds | 3 | Elijah Gray | N/A-StillEmployed | 0 | 4 |
| 265 | Production | Squatrino, Kristen | 10030 | Exceeds | 4 | David Stanley | unhappy | 0 | 16 |
| 289 | Production | Veera, Abdellah | 10014 | Exceeds | 5 | Kissy Sullivan | maternity leave - did not return | 0 | 15 |
| 293 | Production | Volk, Colleen | 10022 | Exceeds | 5 | Kelley Spirea | gross misconduct | 0 | 18 |
| 304 | Production | Winthrop, Jordan | 10033 | Exceeds | 3 | Brannon Miller | retiring | 0 | 7 |

| | Department | Employee_Name | EmpID | PerformanceScore | EmpSatisfaction | ManagerName | TermReason | DaysLateLast30 | Absences |
|-----|------------|-------------------|-------|------------------|-----------------|-----------------|-------------------|----------------|----------|
| 12 | IT/IS | Barbossa, Hector | 10012 | Exceeds | 4 | Simon Roup | N/A-StillEmployed | 0 | 9 |
| 76 | IT/IS | Dougall, Eric | 10028 | Exceeds | 5 | Jennifer Zamora | N/A-StillEmployed | 0 | 4 |
| 96 | IT/IS | Foss, Jason | 10015 | Exceeds | 5 | Jennifer Zamora | N/A-StillEmployed | 0 | 15 |
| 170 | IT/IS | Lindsay, Leonara | 10008 | Exceeds | 4 | Eric Dougall | N/A-StillEmployed | 0 | 14 |
| 220 | IT/IS | Petrowsky, Thelma | 10016 | Exceeds | 5 | Simon Roup | N/A-StillEmployed | 0 | 16 |
| 308 | IT/IS | Zamora, Jennifer | 10010 | Exceeds | 5 | Janet King | N/A-StillEmployed | 0 | 16 |

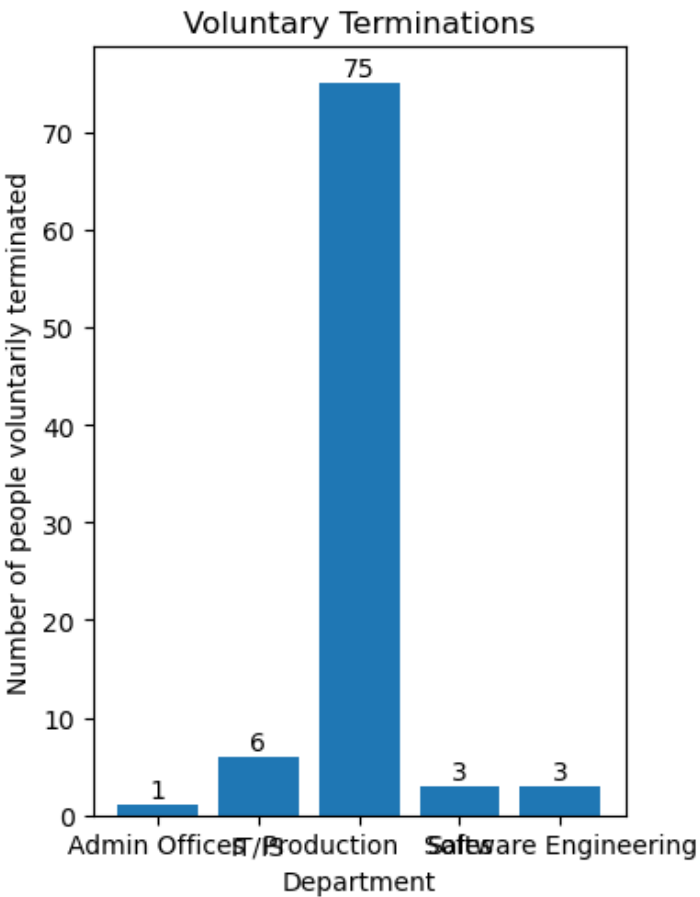
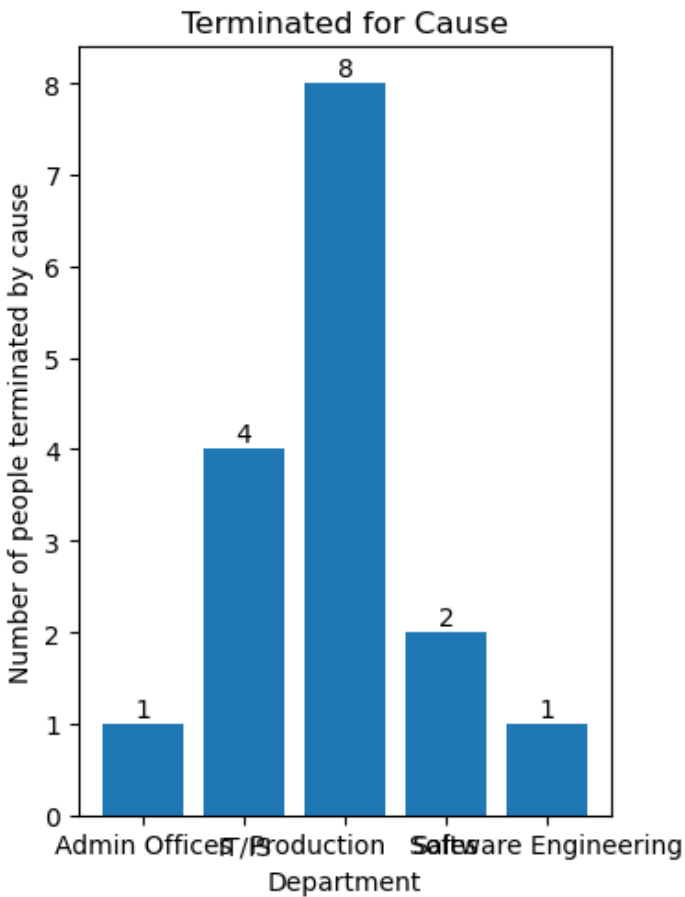
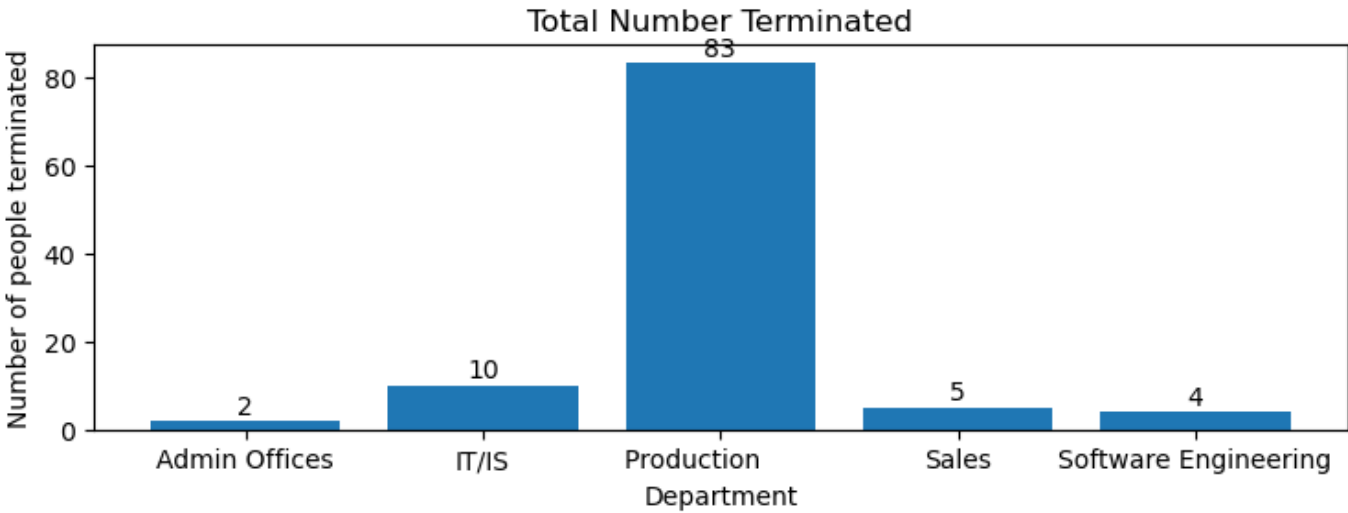
| | Department | Employee_Name | EmpID | PerformanceScore | EmpSatisfaction | ManagerName | TermReason | DaysLateLast30 | Absences |
|-----|----------------------|------------------|-------|------------------|-----------------|-----------------|-------------------|----------------|----------|
| 212 | Software Engineering | Patronick, Lucas | 10005 | Exceeds | 5 | Alex Sweetwater | Another position | 0 | 13 |
| 274 | Software Engineering | Szabo, Andrew | 10024 | Exceeds | 5 | Alex Sweetwater | N/A-StillEmployed | 0 | 1 |

| | Department | Employee_Name | EmpID | PerformanceScore | EmpSatisfaction | ManagerName | TermReason | DaysLateLast30 | Absences |
|-----|------------|----------------|-------|------------------|-----------------|---------------|-------------------|----------------|----------|
| 77 | Sales | Driver, Elle | 10006 | Exceeds | 5 | Lynn Daneault | N/A-StillEmployed | 0 | 14 |
| 282 | Sales | Torrence, Jack | 10013 | Exceeds | 3 | Lynn Daneault | N/A-StillEmployed | 0 | 6 |

TERMINATION ANALYSIS

Most Common Department Terminations:

- Production has the highest number of terminations, followed by IT/IS. However, most of these terminations are voluntary, with only 8 terminations being terminated by cause.
- Software Engineering and the Administration Office have only had one employee being terminated by cause, whereas IT/IS has had 4. IT/IS has the highest percentage of terminations (40 %) overall so the recruitment team need to reconsider their hiring process.

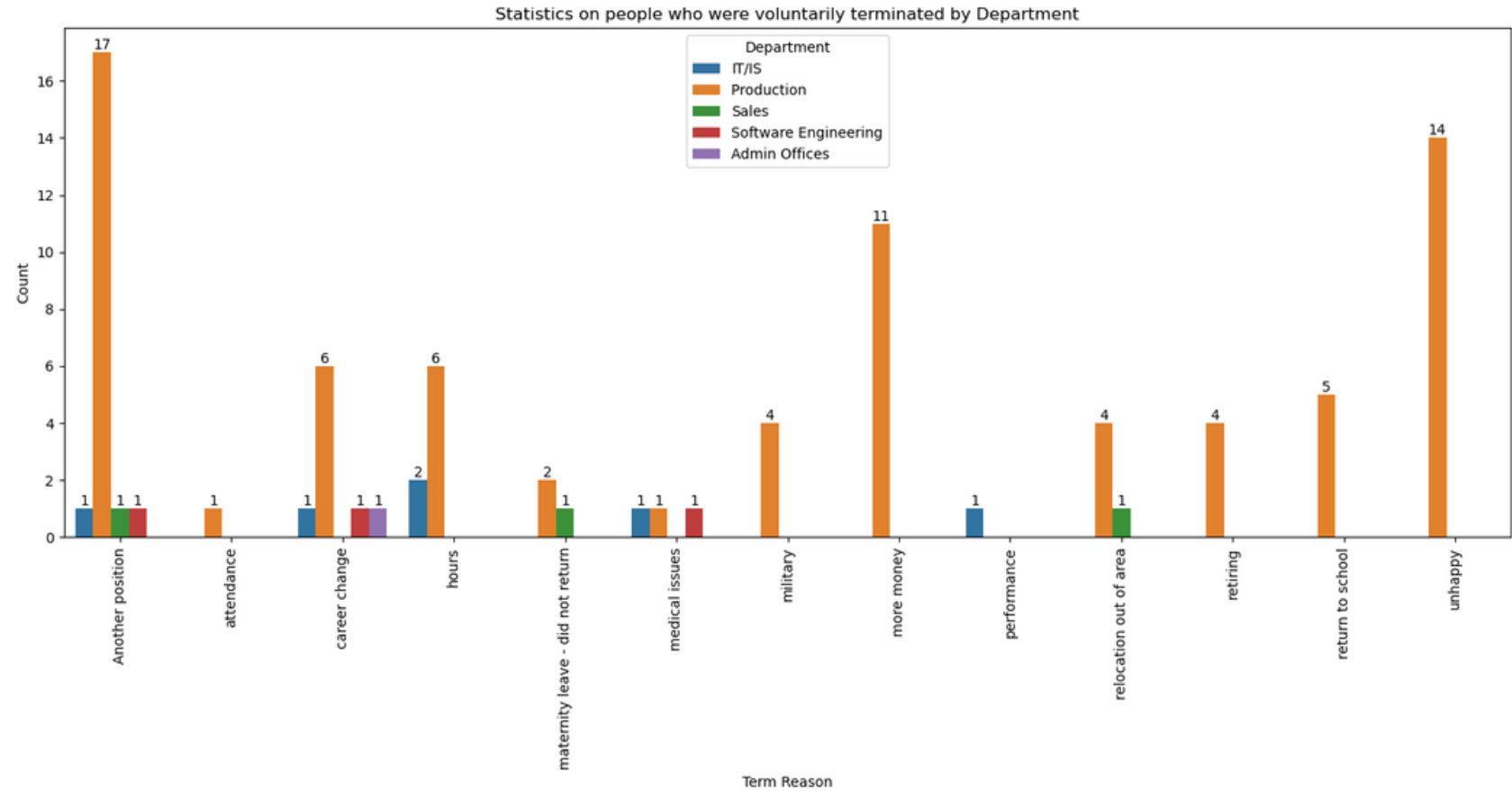
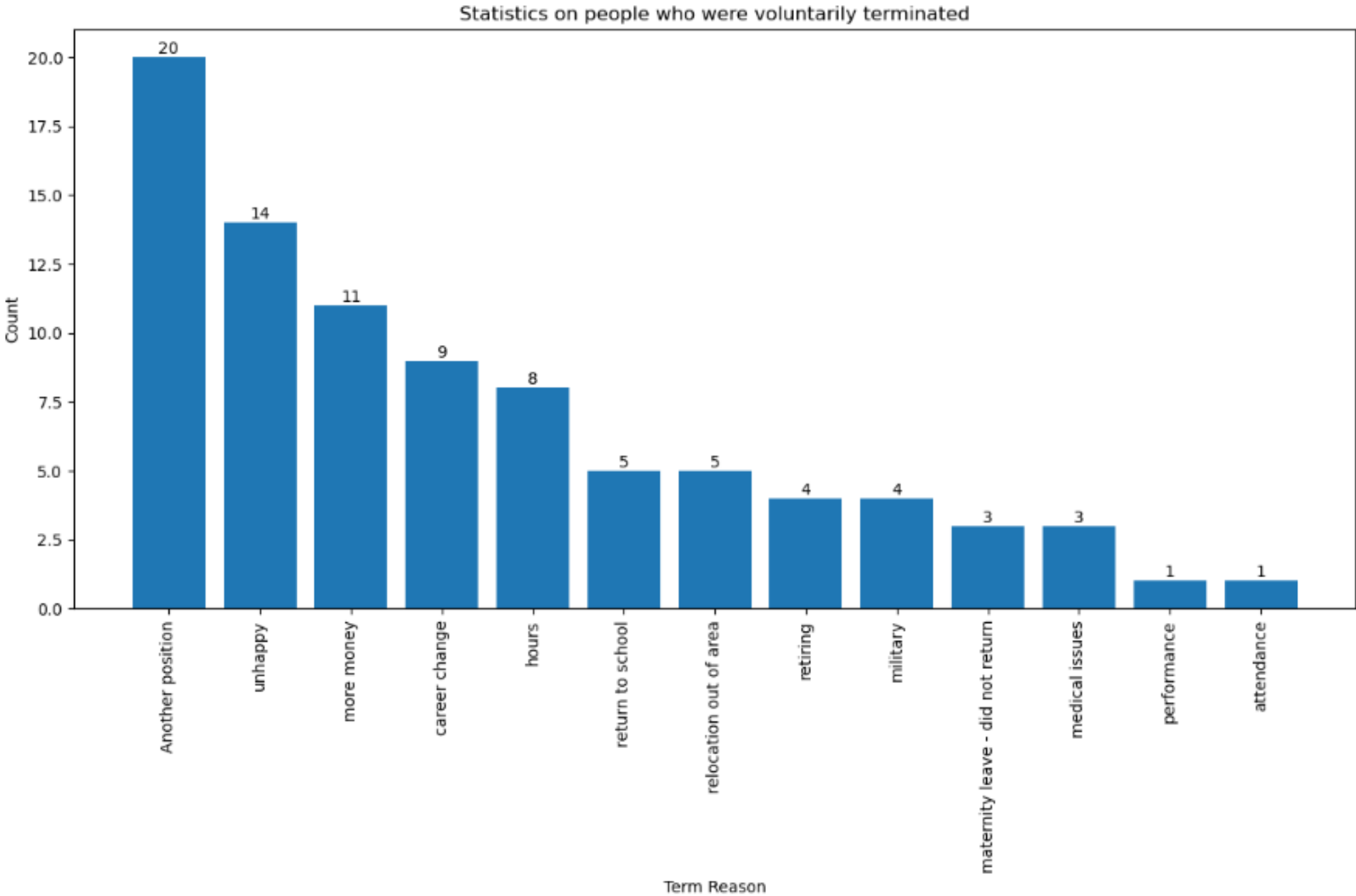


VOLUNTARY TERMINATIONS

- **Another Position:** The biggest cause of termination is due to other positions being offered. Most people leave because of this reason within the Production Department, indicating we need to improve salaries and employee satisfaction in this area.
- **Unhappy:** All people who have terminated their contract because they are unhappy are in the Production Department further emphasising the importance for the Company XYZ to direct their focus to this.

We notice an anomaly for Attendance and Performance being a reason why people are voluntarily terminating; this should be in termination for cause.

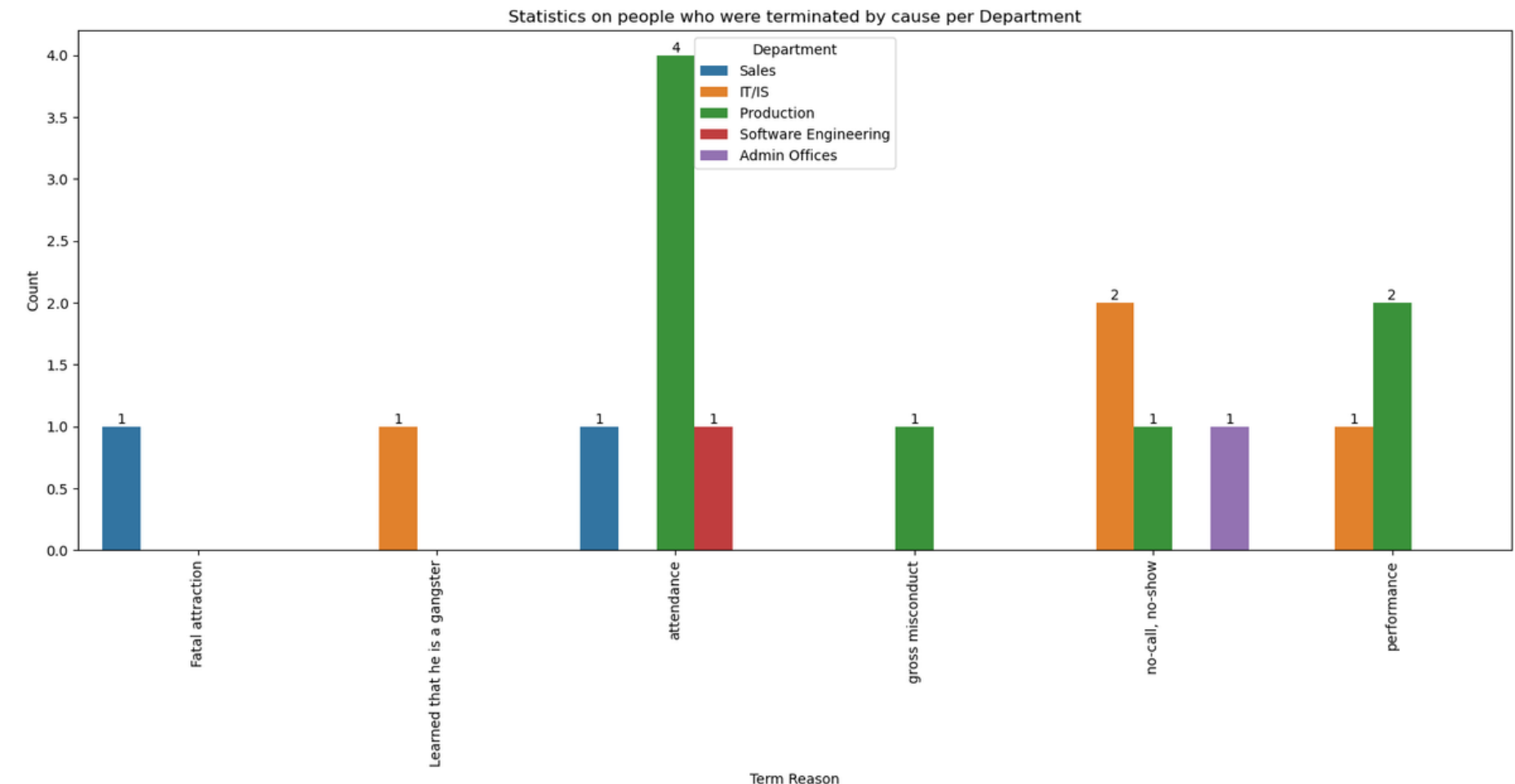
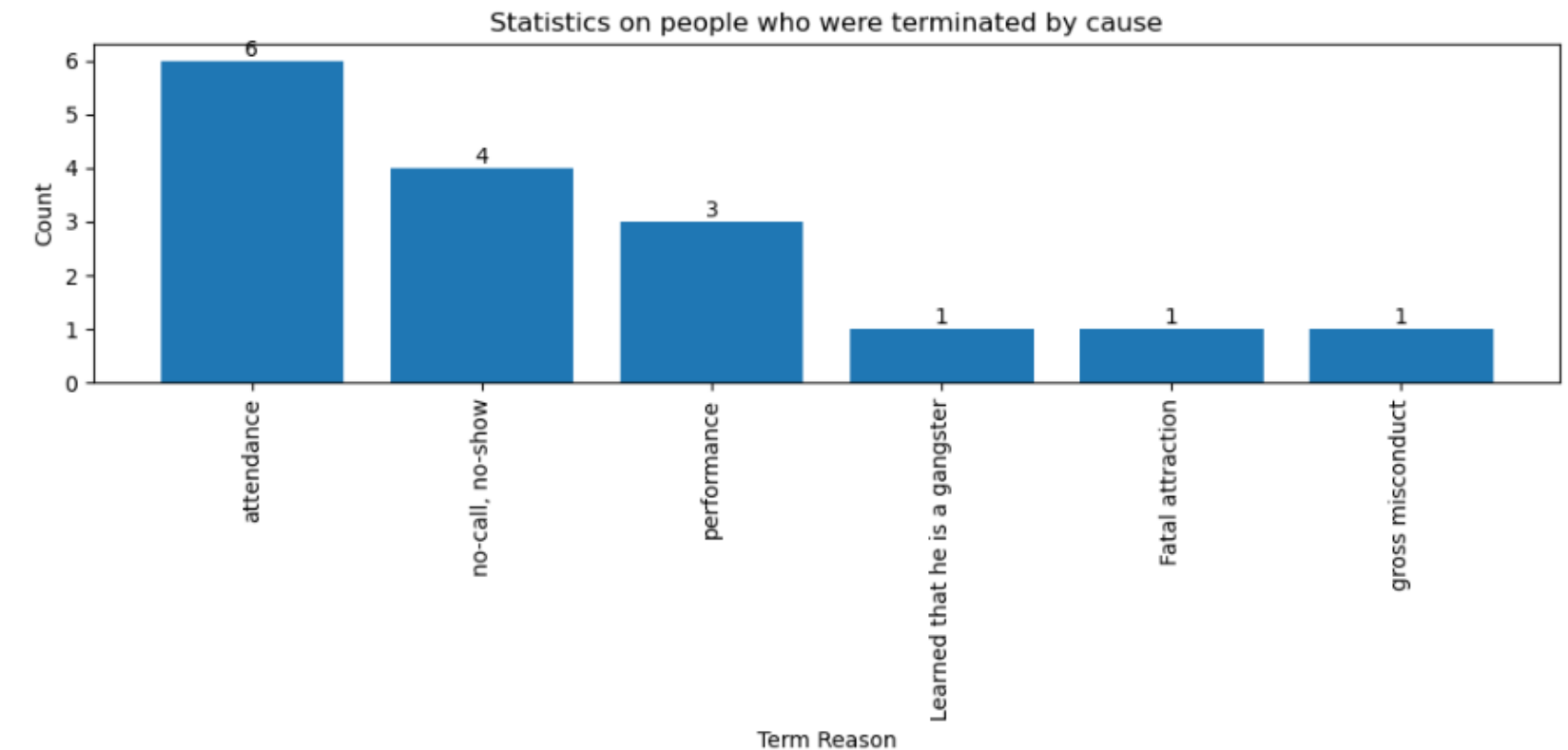
To conclude, majority of people in the production sector leave, some because there are better positions, however there are 11 people leaving as there is not enough pay and 14 people leaving due to unhappiness. The IT/IS sector could focus on reducing its hours and perhaps hiring more people to spread the workload, reducing performance and hours terminations.



TERMINATIONS BY CAUSE

- **.Attendance:** Attendance is the most common factor for terminating workers. To reduce layoff, references and an option to work from home to increase productivity should be given.
- **Gangster:** Background Checks should be thorough before allowing employees to work
- **No-call, no-show:** Emergency leaves should be given. (Second most common reason)
- **Performance:** Employees who continue to perform poorly should be given an opportunity to see a therapist if this is for personal reasons. Mental Health should be considered. (Third Most Common Reason)

IT/IS need to improve there recruitment process by conducting background checks considering performance of employees.



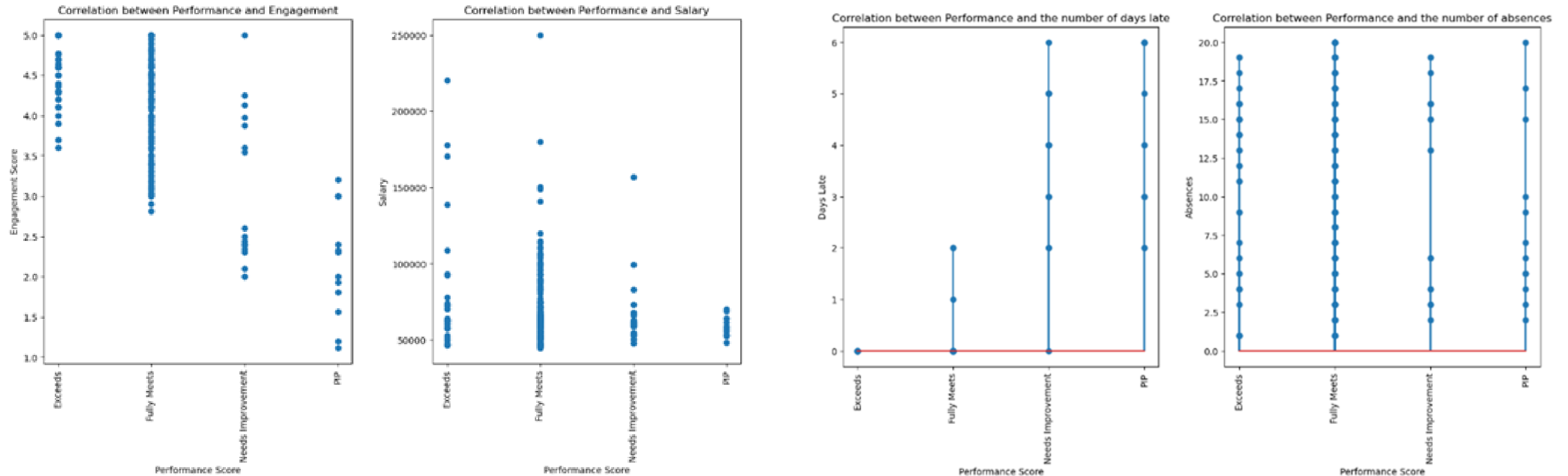
DISTRIBUTION OF EMPLOYEE ENGAGEMENT AND EMPLOYEE SATISFACTION



| | nobs | minmax | mean | variance | skewness | kurtosis |
|---|------|-------------|------|----------|-----------|----------|
| 0 | 311 | (1.12, 5.0) | 4.11 | 0.824001 | -1.111585 | 1.12889 |

| | nobs | minmax | mean | variance | skewness | kurtosis |
|---|------|--------|----------|----------|-----------|-----------|
| 0 | 311 | (1, 5) | 3.890675 | 0.826719 | -0.221534 | -0.789625 |

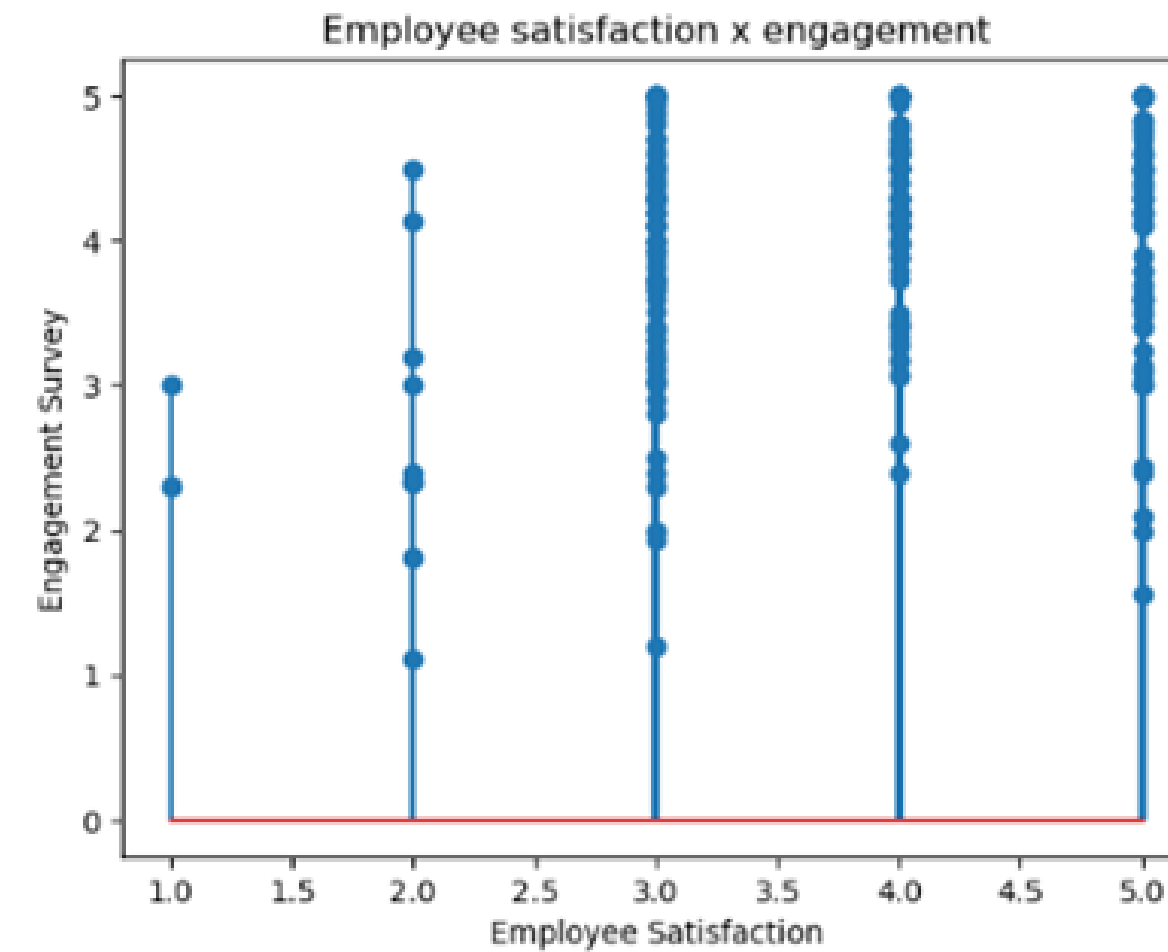
CORRELATION ANALYSIS OF PERFORMANCE



We analyse a few factors which we think affect employee performance, and we conclude:

- Engagement and Performance have a strong relationship, with high performing employees achieving higher engagement scores.
- There is a weak link between Performance and Salary. Slight positive linear relationship with a higher salary leading to better performance.
- There is a strong correlation with performance and punctuality.
- There is no correlation between the performance and the number of absences.

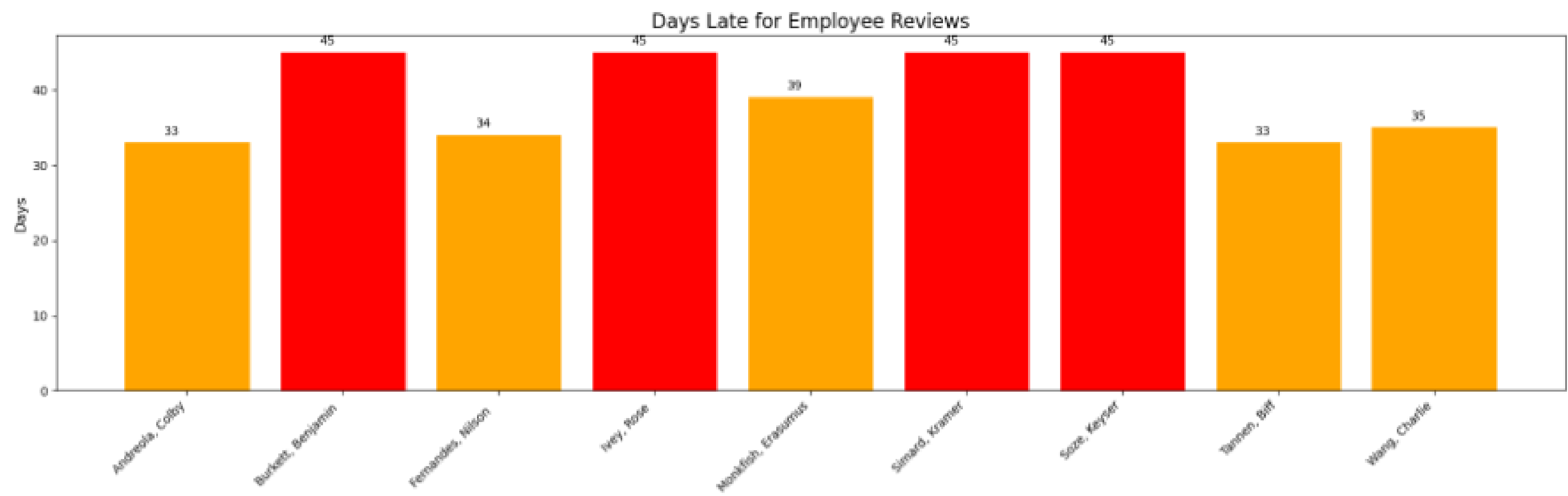
OTHER RELATIONSHIPS EXPLORED



From these graphs, we can see:

- A moderately strong positive linear relationship with employees receiving special projects having a higher salary.
- A slight positive relationship between employee satisfaction and engagement (these are not the greatest indicators of each other)

EMPLOYEES WHO NEED REVIEWS



Here is a graph depicting employees who are active and have not been reviewed within the last month, over 30 days. Those who have not been reviewed in 40 days are highlighted in red.

Company XYZ should conduct reviews every 30 days to ensure employees are meeting their standards.

CONCLUSIONS PT. 1

From our analysis, we have uncovered several findings providing an overview and valuable insights into Company XYZ workforce dynamics. These insights can be used to make significant changes to improve the performance, reduce turnover rate and increase employee satisfaction. Several strategic data-driven decisions can be made.

Gender Diversity and Salary Dynamics: Higher number of females (>120) than males (>80) overall and within production, CEO and CIO are both female and earn \$220k - \$250k, Sales and Software Engineering Departments are the most balanced. Males have a slightly higher average salary than females. Higher number of female Software Engineers and Area Managers, but more male Data Analysts. Specialised roles notably earn higher.

Department Analysis: IT/IS has the highest number of Special Projects, Special Projects need to be delegated to maximise efficiency and employee engagement. The Administration Office has the highest tenure. The software engineering department has the highest employee satisfaction, and changes need to be made in the Executive Office department to improve this. The Sales department has the highest number of absences; this needs to be addressed, on the other hand Software Engineers have the best track record. Sales has the most PIP performance scores, so there needs to be reconsideration of the hiring process within this department. There are a significant number of issues in the Production Area with many employees needing to improve their performance. We should consider pay-scale revisions for this department. Another option can be to introduce training programs to help improve worker performance.

Recruitment: LinkedIn and Indeed have shown to be the most popular recruitment centers for XYZ's employees. Introducing websites, and on-line web applications are other alternatives to improve employee recruitment. We can identify the sources for attracting higher-performing employees.

Manager Analysis: Highest number of employees managed by the manager is 22, with there being 6 managers that have reached full capacity. We can use this analysis to reward managers, and speak to them about methods of improving their scores, increasing employee satisfaction. There are only a few managers with an Employee Satisfaction of 4.0 and XYZ can improve on this.

CONCLUSIONS PT.2

Employee Analysis: Looking at employees whose performance exceeds expectations, we can see that within the Production Sector a significant number of workers terminated their contracts due to inadequate pointing at the need to increase pay. We can consider giving bonuses to employees who exceed expectations.

Termination Analysis: Production has the highest number of terminations, and the IT/IS department have the highest percentage of terminations by cause. Training and Mentorship should be provided to employees within this sector to enable smoother transition into the workplace. XYZ should also consider hiring more employees to reduce the workload.

- **Voluntary Terminations:** Majority of people terminating their contracts voluntarily are in the Production Sector with leaving their position, being unhappy or requiring more money being the three main reasons. We can consider reducing the hours and spreading the workload more in the IT/IS and Production departments.
- **Termination by Cause:** Attendance is the most common factor for terminating workers. Options to work from home for software engineers and data analysts could increase employee satisfaction. References should be provided to avoid companies laying off workers. Background checks should be done before allowing employees to work, and emergency leaves should be given to mitigate “no-call, no show” cases.

Distribution of Employee Engagement and Satisfaction : We observe a top heavy distribution for Employment Engagement, which is positive. On the other hand, the “wavy” pear shape violinplot for Employee Satisfaction highlights room for improvement.

Correlation Analysis of Performance: We observe that employee engagement and punctuality contribute to employee performance. This data can be used to build models to predict performance based on their past record.

Other Correlations: There is a link between the number of special projects and salary, with higher salary earners receiving more projects. However, this is not always the case which indicates we need to revise our pay scheme, as the number of special projects will decrease as the salary decreases.

Review Reconsideration: Company XYZ should conduct reviews every 30 days. There are some employees in need of a review. Monitoring our employees more closely and offering help will increase their employee satisfaction and hence reduce turnover rate.

OPPORTUNITIES FOR FURTHER WORK

- Building models to analyse Managerial Performance, and Employee Performance overall, based on different metrics, which can lead to schemes to optimise and improve their performance and wellbeing.
- We can use unsupervised learning models such as K-Means to achieve this, as well as traditional supervised learning algorithms.
- We could consider building a new model for when employees need reviews and should undergo monitoring/further investigation to reduce turnover rate.

THANK YOU

Rohit Sunku

