# Analysis of Sales Representative Salaries by Personality Types

**Introduction**
In this report, we will analyze a dataset concerning sales representatives' salaries within a software product group, with a specific focus on four personality types. Our aim is to provide insights to the company's top management team regarding the relationship between personality types and various factors such as Net Promoter Score (NPS), gender, and salary.

**Objective**
The objective of this report is to analyze the dataset to understand the distributions of relevant variables, explore connections between personality types and NPS, gender, and salary, and provide key insights to the company's management team.

**Dataset Overview**
The dataset encompasses 12,130 rows with 11 columns. Each row corresponds to a Sales Representative's profile in the software product group, identified by a unique ID. The detailed data dictionary is given below.

**Data Dictionary**

| Variable | Description | Data Type | Missing Values |
|---|---|---|---|
| Sales_Rep | Unique ID of the Sales Representative | Integer | 0 |
| Business | Business associated with the Sales Representative | String | 0 |
| Age | Age of the Sales Representative | Integer | 0 |
| Female | A binary variable indicating the Gender of the Sales Rep | Integer | 0 |
| Years | Number of Years of Experience | Integer | 0 |
| College | Indicates whether the Sales Rep is a College Graduate or not | String | 0 |
| Personality | Personality type of the Sales Representative | String | 0 |
| Certificates | Number of Certificates achieved | Integer | 0 |
| Feedback | Feedback Score received on a scale of 0 to 4 | Float | 0 |
| Salary | Salary of the Sales Representative | Integer | 0 |
| NPS | Net Promoter Score rated on a scale from 0 to 10 | Integer | 0 |

**Descriptive Statistics**

| Variable | N | Mean | Std Dev | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| Age | 12,130 | 39.00 | 10.36 | 21.00 | 30.00 | 39.00 | 48.00 | 57.00 |
| Years | 12,130 | 2.42 | 2.17 | 1.00 | 1.00 | 2.00 | 2.00 | 13.00 |
| Certificates | 12,130 | 2.75 | 1.65 | 0.00 | 1.00 | 3.00 | 4.00 | 6.00 |
| Feedback | 12,130 | 2.65 | 0.81 | 1.11 | 1.99 | 2.68 | 3.37 | 4.00 |
| Salary ($) | 12,130 | 72176.75 | 22628.96 | 21000.00 | 56000.00 | 68800.00 | 85000.0 | 192000.0 |
| NPS | 12,130 | 6.30 | 2.18 | 1.00 | 5.00 | 6.00 | 8.00 | 10.00 |

- The Sales Representatives' age in the dataset is spread across 21 to 57 years. The mean and median age are both 39 years, suggesting a relatively balanced distribution without significant skewness.
- Sales representatives have an average of 2.42 years of experience ranging from 1 to 13 years. The distribution is skewed to the left, with the majority having two years of experience (25 to 75%)
- On average, sales representatives have 2.75 certificates, ranging from 0 to 6. The distribution is slightly right-skewed, with the median (3.00) greater than the mean (2.75). Most sales representatives have 4 or fewer certificates.
- The average feedback score is 2.65, with a standard deviation of 0.81. Feedback scores range from 1.11 to 4.00, with a median score of 2.68, indicating moderate variability in scores with a slight positive skewness.
- Salaries range from $21,000 to $192,000, with an average salary of $72,176.75 and a standard deviation of $22,628.96. The median salary is $68,800, suggesting a slightly right-skewed distribution.
- NPS values range from 1.00 to 10.00, with an average NPS of 6.30 and a median score of 6.00.

**Correlation Analysis**
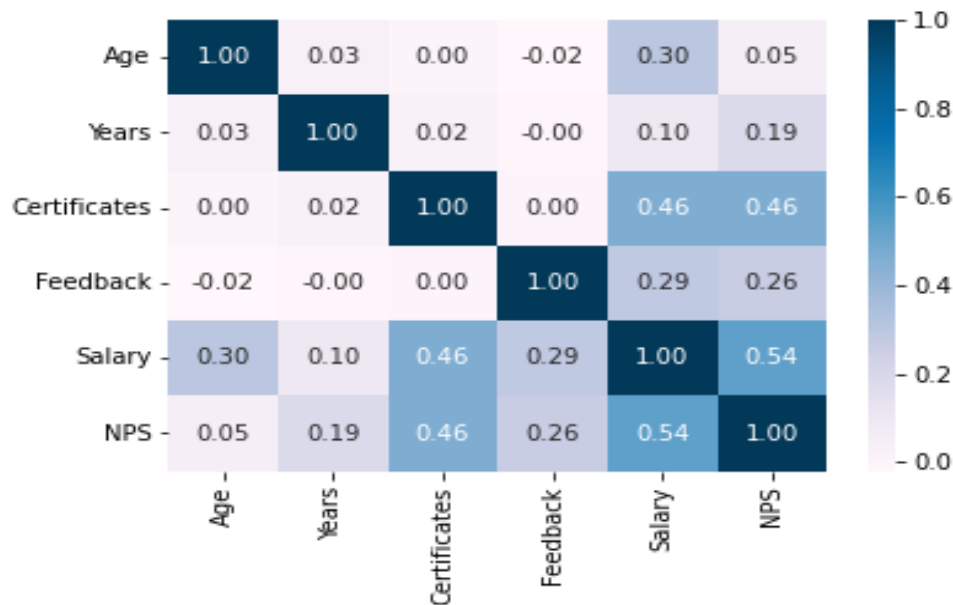
The heatmap analysis reveals minimal correlation among pairs of Age, Years of experience, Certificates, Feedback, Salary, and Net Promoter Score (NPS) within the dataset. This lack of significant correlations suggests that these variables are relatively independent of each other, indicating that changes in one variable are not consistently accompanied by changes in another.
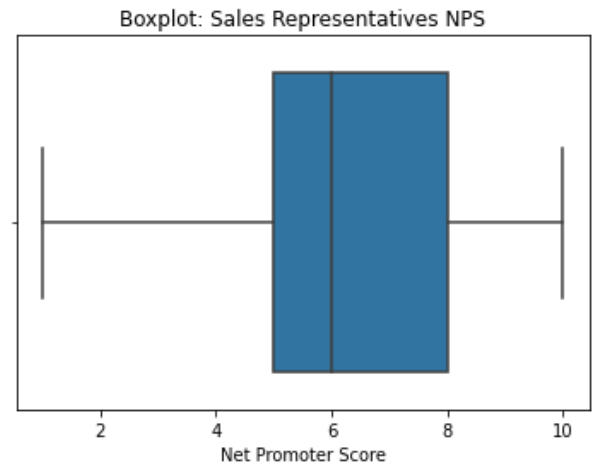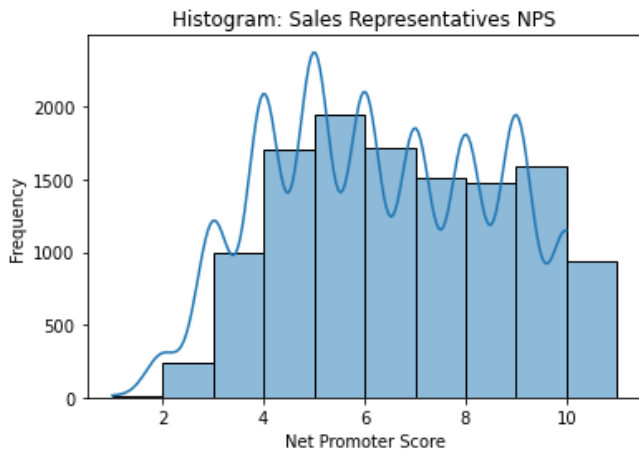
**Univariate Analysis - Quantitative Variables**

**Salary:**
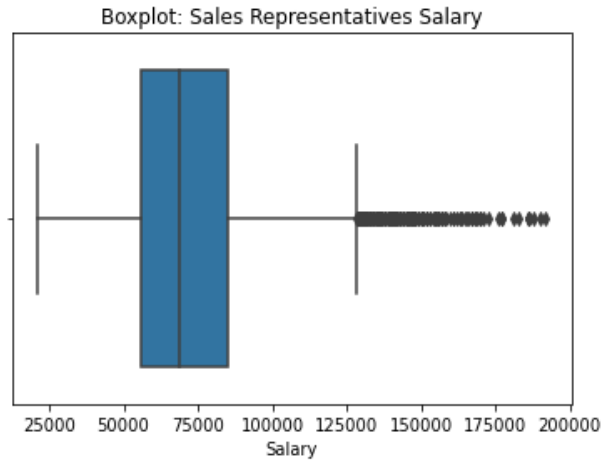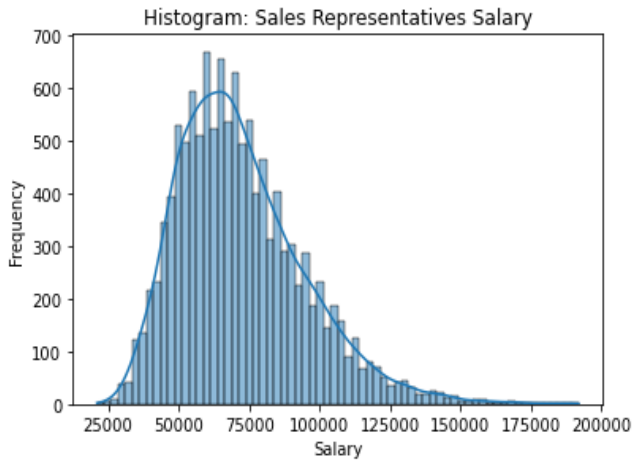


The salary distribution is slightly right-skewed with the presence of outliers, suggesting a few Sales Representatives receive exceptionally high salaries beyond the typical range.

**Net Promoter Score (NPS):**



Net Promoter Score (NPS) exhibits a relatively balanced distribution without outliers. The majority of the scores fall between 5 and 8, indicating that a significant proportion of Sales Representatives hold a moderate to positive outlook based on customer feedback.
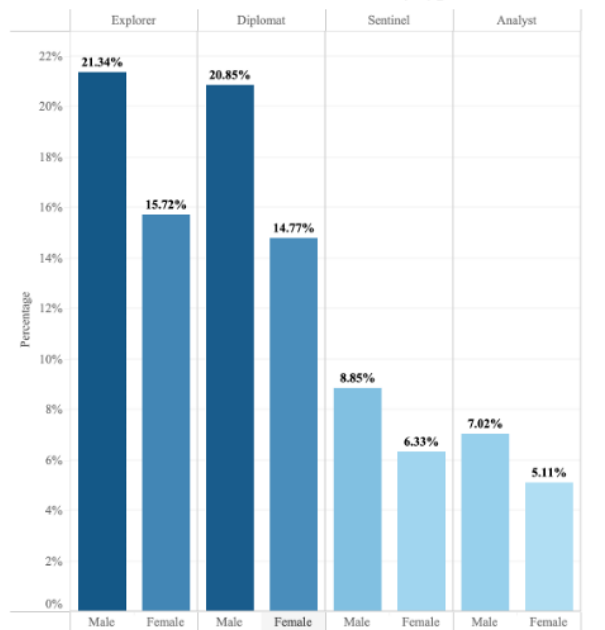
**Years of Experience:**
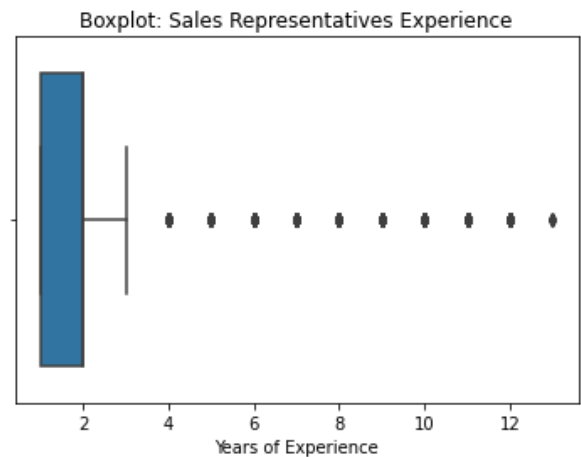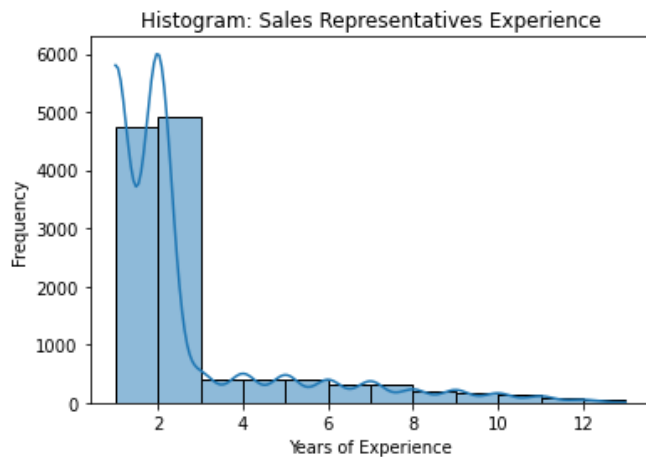


The distribution of experience among Sales Representatives is skewed to the left, indicating that a significant proportion of individuals have relatively lower levels of experience with the presence of Outliers. Analyzing the experience distribution by gender and personality trait reveals no substantial difference. Most Sales Representatives, regardless of personality type and gender, tend to have around two years of experience.

**Univariate Analysis - Categorical Variables**
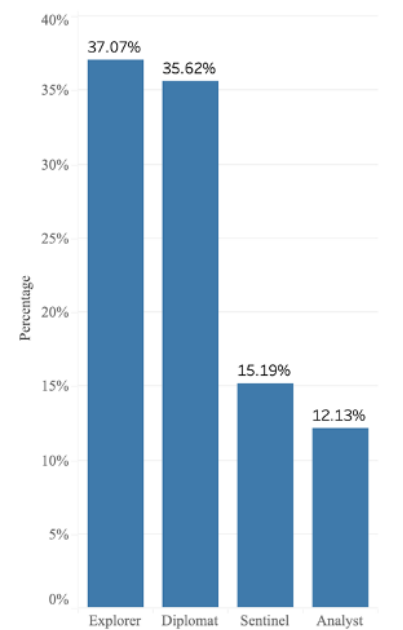


Among sales representatives, those with Explorer personalities make up approximately 37% of the workforce, closely followed by those with Diplomat personalities at 36%. Moreover, upon examining the relationship between personality types and gender, it's observed males constitute a higher percentage within each personality category.

**Multivariate Analysis**

**Personality Traits vs. NPS:**
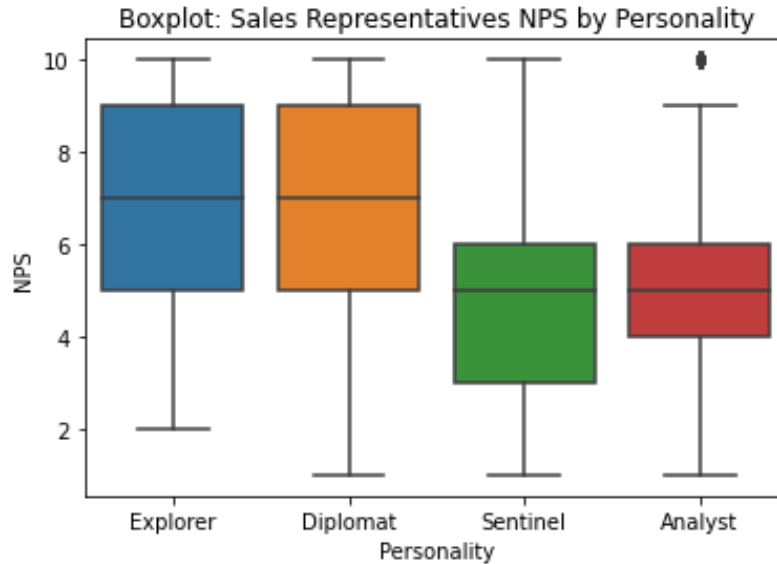


Analyzing the NPS by personality type revealed some interesting insights. Explorer and Diplomat personalities exhibit similar median NPS scores of 7, with the majority of NPS scores falling between 5 and 9, reflecting a generally positive customer sentiment. Despite this, the scattered distributions in their boxplots suggest diverse customer experiences within both personality types.

In contrast, Sentinel and Analyst personalities exhibit identical median scores of 5, indicating a relatively moderate satisfaction level. However, a closer examination reveals that the Analyst's boxplot displays a higher density around the mean with a smaller box size, suggesting a more concentrated distribution. In contrast, Sentinel's boxplot reveals a scattered distribution, particularly towards the lower quartile. Analyst's outliers underscore exceptional instances of customer satisfaction within this personality type.

**Personality Traits & Gender Vs Salary:**
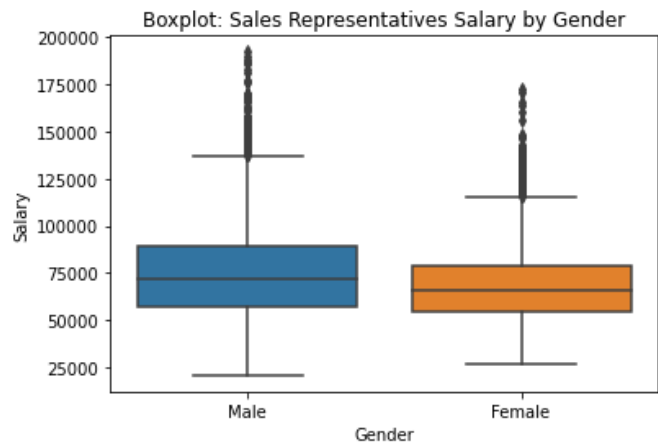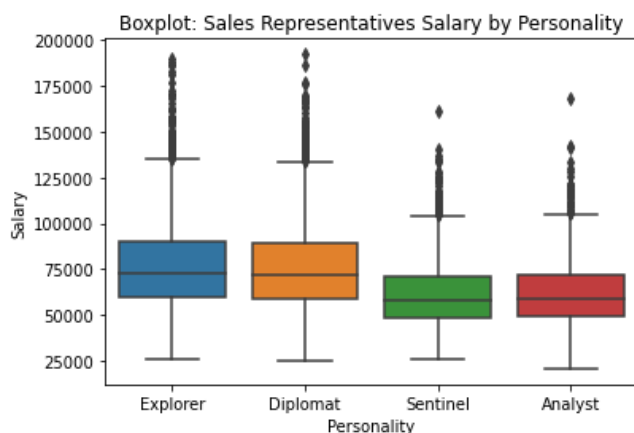
Our analysis of Salary by Personality traits and gender highlights distinct trends among the Sakes Representatives. Individuals with Explorer and Diplomat personalities exhibit higher median and range salaries compared to their counterparts with Sentinel and Analyst personalities, suggesting that personality traits may influence earning potential.

Examining Salary by Gender, the box plot reveals that male representatives generally have slightly higher median and range salaries compared to their female counterparts. This discrepancy implies a gender-based disparity in earnings within the Sales Representative group. Moreover, both box plots display outliers, indicating instances of individuals with salaries significantly deviating from the typical range.

**College and Certificates Vs Salary:**
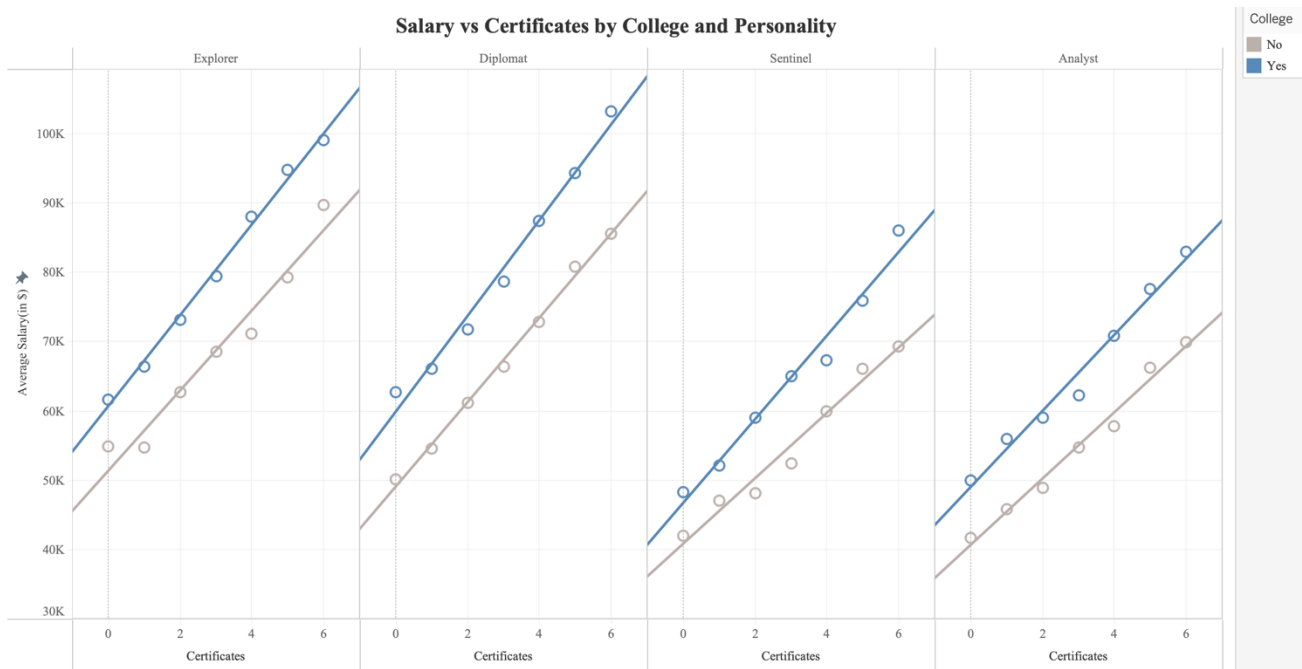


Across all personality types, a consistent trend emerges, revealing higher average salaries for individuals with an increasing number of certificates, particularly among college graduates. This pattern signifies a positive correlation between earning potential and the attainment of professional certificates and college degrees. Notably, Diplomats stand out with the most substantial average salary among those who have attained the maximum number of six certificates.

**Gender-Based Salary Analysis:**



Gender-Based Salary Analysis: Exploring Relationships with Key Attributes
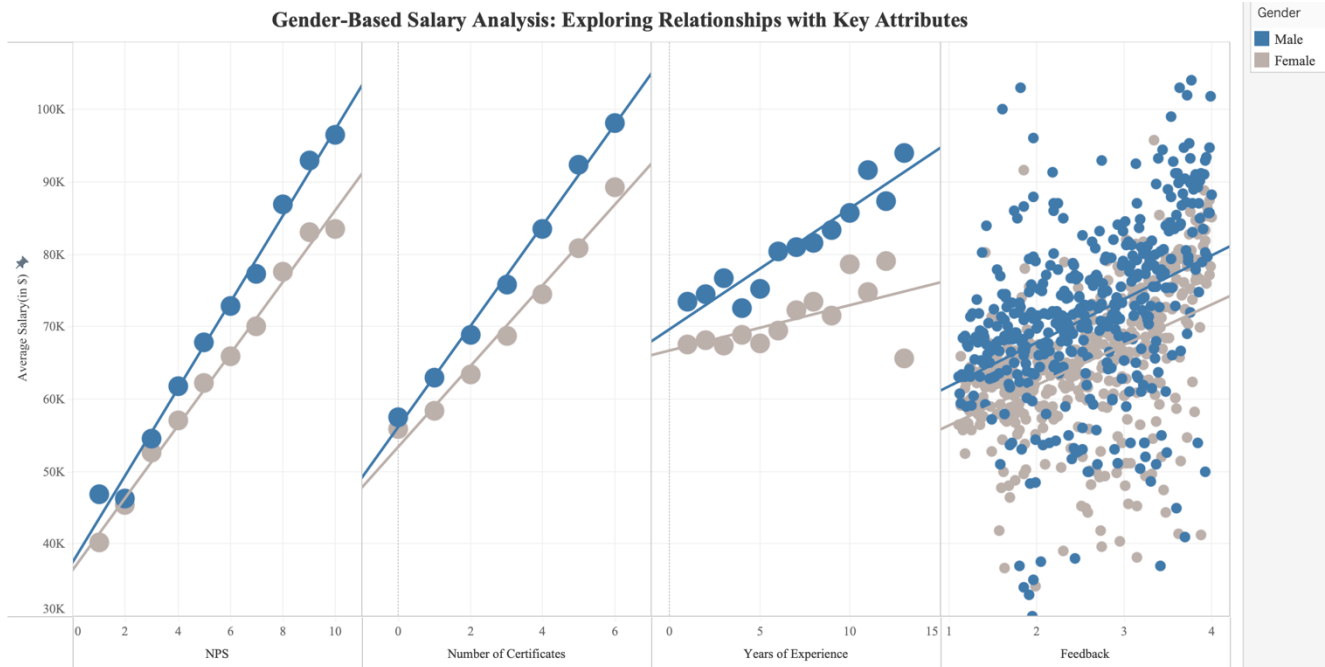
The above visualization indicates evident gender-based disparities in salary despite women displaying higher Net Promoter Scores (NPS), more certifications, extensive experience, and positive feedback.

**Key Insights:**

From the above analysis, we have the following conclusions:

- Explorer and Diplomat show dominance over Sentinel and Analyst in higher Salary, Certifications & NPS scores.
- There is no correlation between Feedback, Age, or Years of Experience and Salary of the Personality traits.
- It is evident from the data that the company may be exhibiting gender-based discrimination, particularly noted in instances where women with higher years of experience, advanced certifications, and good feedback scores receive lower salaries compared to their male counterparts.

**Recommendations:**

Based on the conclusion drawn from the analysis of data, we recommend:

- Capitalizing the strengths of Explorer and Diplomat personalities by tailoring customer engagement strategies that align with their preferences, further enhancing satisfaction levels.
- Develop a comprehensive strategy to uplift Sentinel satisfaction, considering the broad range of scores.
- Encourage sales representatives to pursue higher certifications, as salary is influenced significantly by their level of certification. This not only enhances individual expertise but also contributes positively to compensation levels.
- Companies should not discriminate based on gender and reward higher salaries based on performance.
- Implementing policies and measures to ensure equitable compensation, fostering an inclusive workplace that values and rewards employees based on merit rather than gender.