

Bank Customers churn

Data Analysis Project

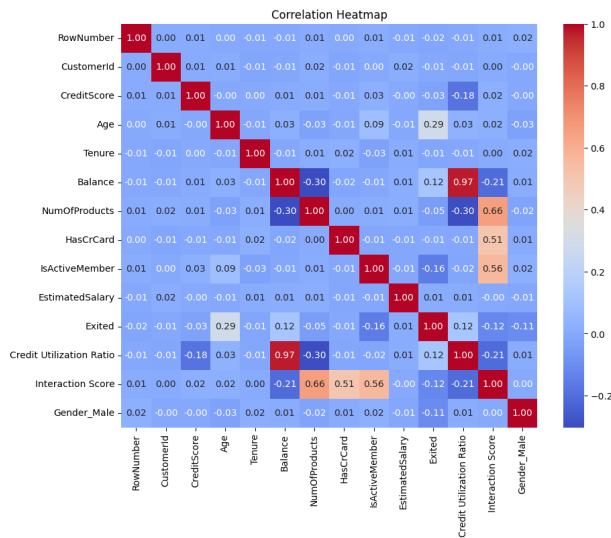
Project outcomes or summery

The main objective of this analysis was to explore the relationship between each feature and customer churn, with a focus on identifying feature levels that exhibit a higher churn rate.

Data Overview:

- Out of the total 10,000 customers, 2,037 (approximately 20%) churned, indicating a significant churn rate.

Correlation Analysis:

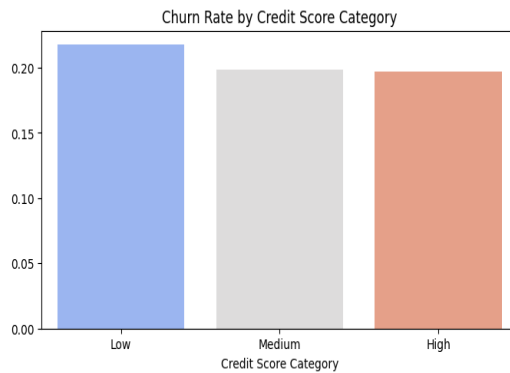


- The correlation heat map revealed the following features with small positive correlations to churn: Age (0.29), Credit Utilization Ratio (0.12), Balance (0.12), and EstimatedSalary (0.01). Conversely, the following features showed small negative correlations to churn: IsActiveMember (-0.16), Interaction Score (-0.12), Gender_Male (-0.11), NumOfProducts (-0.05), CreditScore (-0.03), Tenure (-0.01), and HasCrCard (-0.01).

Feature Selection:

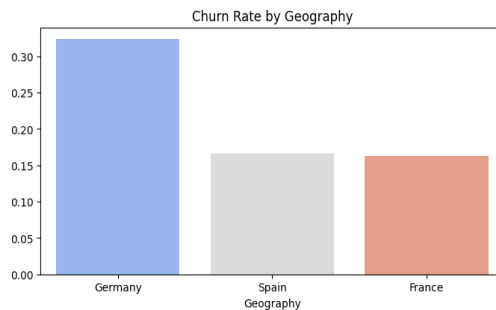
- For this project, we determined that the RowNumber, CustomerId, and Surname have no significant impact on churn. Therefore, we can safely drop or neglect them during the data analysis process.

1. CreditScore & Credit Score Category Features:



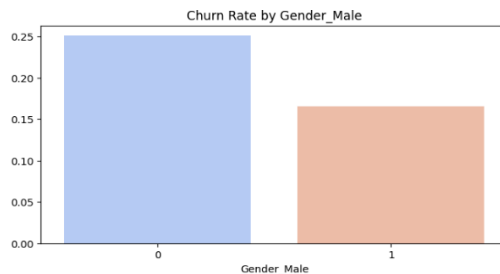
- We observed a clear trend indicating that customers with lower Credit Scores are more likely to churn.
- An alarming 22% of the total 2,969 customers falling into the "low Credit Score" category (Credit Score less than 600) have churned.

2. Geography Feature:



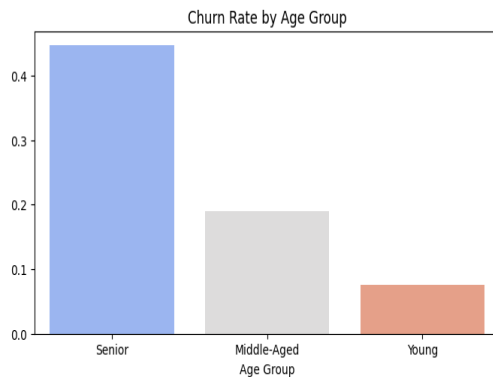
- Although France has the largest customer base of 5,050, only 16% of them are churned. However, the churn rate is significantly higher in Germany, where 32% of the 2,493 customers have churned.

3. Gender_Male Feature:



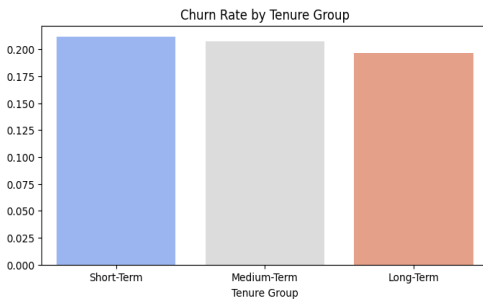
- Interestingly, the churn rate is higher for female customers, with 25% of the total 4,499 female customers churning.

4. Age & Age Group Feature:



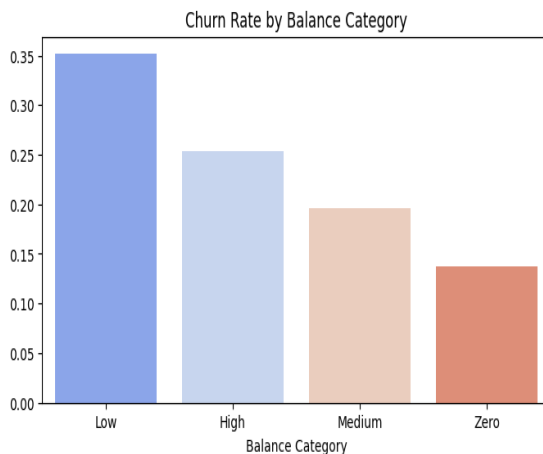
- The data suggests that as the age of customers increases, the likelihood of churning also increases.
- Surprisingly, a substantial 45% of the 1,261 customers in the Senior Age Group (above 50 years) have churned, which contradicts the expectation that older customers typically show resistance to change.
- So, if there is no pandemic disease where there is high death rate among senior people like coronavirus this very strange.

5. Tenure & Tenure Group Feature:



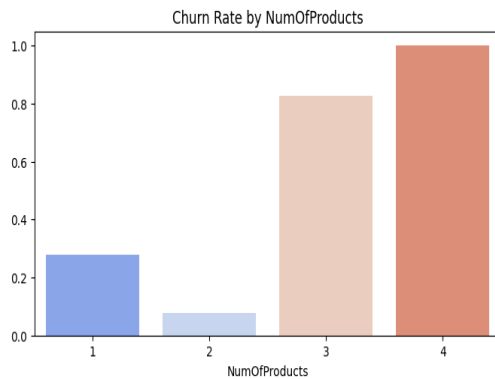
- The analysis of Tenure alone does not show a clear relationship with churn.
- However, when considering customers in the Short-Term Tenure Group (less than 2 years), there is a notable churn rate of 21% among the total 2,496 customers.

6. Balance & Balance Category Feature:



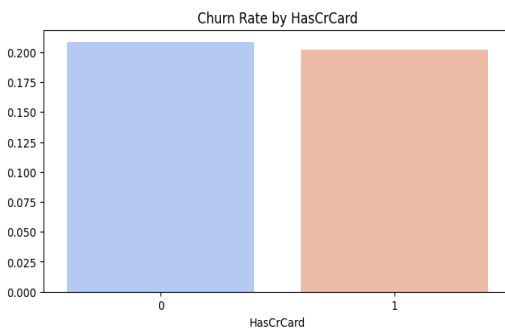
- Higher Balances seem to correlate with a higher likelihood of churning.
- Notably, the churn rate is highest among customers with low balances, with 35% of the 74 customers having balances between {0 - 50k} churning.
- The most significant impact on churn comes from the high balance category, where 25% of the 4,749 customers with balances of 100k and above have churned.
- This may indicate internal factors leading to customer dissatisfaction, or the influence of external competitors offering better services or incentives.

7. NumOfProducts Feature:



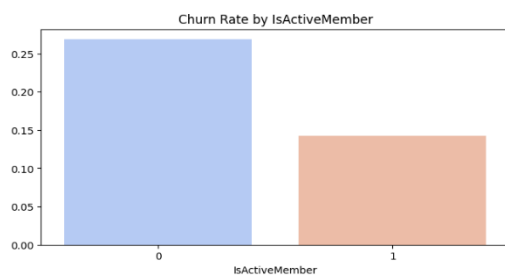
- A concerning pattern emerges as we see that 100% of the 60 customers with 4 NumOfProducts have churned, along with 82% of the 266 customers with 3 NumOfProducts.
- This could indicate issues with the quality of service provided by the bank or the presence of competitors offering superior products and services.

8. HasCrCard Feature:



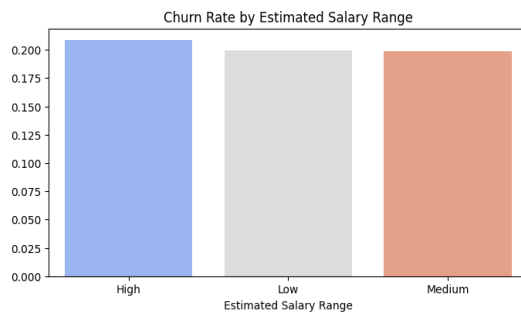
- The churn rates for customers with and without Credit Cards are quite close. However, 21% of the total 2,945 customers without a Credit Card have churned, while the most significant impact on churn comes from 20% of the 7,055 customers with a Credit Card have churned.

9. Is Active Member Feature:



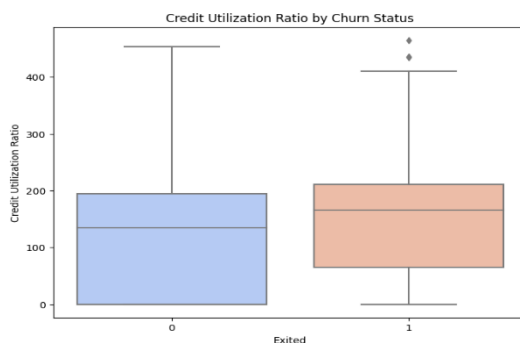
- Approximately 27% of the total 4,849 inactive customers have churned, indicating that customer engagement is essential in retaining them.

10. EstimatedSalary & Estimated Salary Range Features:



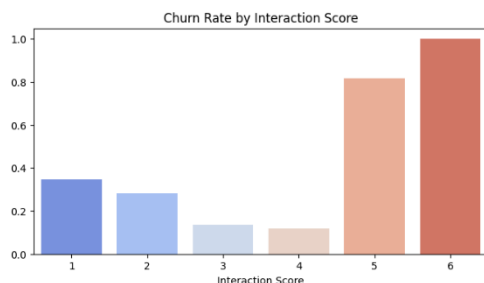
- Customers with higher Estimated Salaries have a higher likelihood of churning.
- A significant 21% of the total 5,010 customers falling into the "High Estimated Salary Range" (100k and above) have churned.
- This suggests a need to address potential internal factors causing customer dissatisfaction or consider the impact of external competitors.

11. Credit Utilization Ratio Feature:



- A clear relationship emerges between Credit Utilization Ratio and churning: the higher the ratio, the higher the churn rate.
- Customers with higher credit utilization ratios may face financial stress, leading them to churn. Conversely, customers with low credit utilization ratios exhibit responsible credit management and are less likely to churn.

12. Interaction Score Feature:



- Remarkably, all customers (100%) with an Interaction Score of 6 (19 Customers) have churned, and approximately 82% of 110 customers with an Interaction Score of 5 have also churned.
- This emphasizes the need for the bank to improve service quality and product offerings to meet customer expectations and compete effectively with other providers in the market.

In conclusion, the analysis highlights several important insights regarding customer churn. It is crucial for the bank to address specific factors, such as Credit Score, Age, Balance, NumOfProducts, EstimatedSalary, and Interaction Score, to mitigate churn risks effectively. By understanding and acting on these patterns, the bank can enhance customer retention, improve service quality, and stay competitive in the market.