**Python Data Analysis Questions (No Machine Learning)**

**📂 1. Data Loading and Preparation**

**Q1.** Load the dataset into a pandas DataFrame. Print the first 5 rows and display the data types of all columns.

**Q2.** Check for any missing or duplicate records in the dataset. How many are there?

**Q3.** Convert the categorical columns Geography and Gender into appropriate numerical formats using label encoding or one-hot encoding.

**📊 2. Churn Rate Analysis**

**Q4.** Calculate the overall churn rate in the dataset. Display both the count and the percentage of customers who exited.

**Q5.** Group the data by Geography and calculate the churn rate for each country. Sort the result by churn rate in descending order.

**👥 3. Demographics and Churn**

**Q6.** What is the average age of customers who churned versus those who did not? Provide a comparison summary.

**Q7.** Determine what percentage of churned customers are aged over 45. Compare it to their overall percentage in the dataset.

**Q8.** Analyze churn rate by Gender. Do males or females churn more?

**🏦 4. Product & Account Insights**

**Q9.** Analyze the churn rate based on NumOfProducts. Create a summary table showing churn rate for 1, 2, 3, and 4 products.

**Q10.** Among customers with a Balance of zero, what percentage have exited the bank?

**Q11.** What is the average tenure of customers who churned compared to those who didn’t?

**🧾 5. Credit and Financial Insights**

**Q12.** Calculate churn rates for customers with:

* CreditScore < 600
* CreditScore > 800

What do these churn rates indicate?

**Q13.** Among customers with a HasCrCard value of 0 and 1, compare the churn rates. Is holding a credit card correlated with retention?

**Q14.** Create a new column categorizing CreditScore as: 'Low' (<600), 'Medium' (600–800), 'High' (>800). Group by this category and show churn rate.

**📈 6. Engagement and Salary Analysis**

**Q15.** Compare churn rates between active (IsActiveMember = 1) and inactive (IsActiveMember = 0) customers.

**Q16.** What is the average EstimatedSalary for churned vs non-churned customers? Is salary a clear churn factor?

**Q17.** Find the top 5 surnames associated with the highest churn counts. What might this indicate?