Advanced Visualization

1. This code creates a scatter plot showing the relationship between customer tenure and monthly charges, with points colored by churn status. Each point represents a customer, where the x-axis is tenure and the y-axis is monthly charges. The plot helps visualize how churned and non-churned customers differ in their spending and duration with the company.

2. This code groups customers by their payment method and whether they have a partner, then calculates the average churn rate for each group. It creates a grouped bar chart where the x-axis shows payment methods, the y-axis shows churn rate, and colors represent partner status. The chart helps compare how churn rates vary across payment types and whether having a partner influences customer retention.

3. This code calculates the average churn rate for each contract type by grouping the data by the 'Contract' column. It then maps numerical contract values to readable labels like "Month-to-month", "One year", and "Two year" for visualization. Finally, it generates a bar chart showing how churn rates differ by contract type, with the y-axis fixed between 0 and 1 for consistency.

4. This code computes the average churn rate for each payment method by grouping the data based on the 'PaymentMethod' column. It maps numeric codes to readable labels like "Electronic check" and "Credit card (auto)" for clarity in the visualization. The resulting bar chart displays how churn rates vary by payment method, with the y-axis standardized between 0 and 1 for easy comparison.

5. This code calculates the average churn rate for each type of internet service by grouping the data based on the 'InternetService' column. It maps numeric values to descriptive labels like "Fiber optic", "DSL", and "No" internet service to improve plot readability. The resulting bar chart shows how churn rates differ depending on the internet service type, with the y-axis ranging from 0 to 1 for consistent interpretation.

6. This code creates an area plot that explores the relationship between Monthly Charges and Total Charges, differentiating customers by churn status. It groups the lines by whether customers use Paperless Billing and facets the plot into separate panels for each Payment Method. The visualization helps analyze how churn, billing preferences, and payment methods interact with customers' spending patterns.

7. This code tries to create a scatter plot showing the relationship between having Tech Support and Online Security services, colored by churn status. However, since both TechSupport and OnlineSecurity are likely categorical (Yes/No), and Churn is binary, a scatter plot might not visualize this well without converting categories to numeric or jittering. The plot aims to explore how combinations of these two services relate to customer churn, using color to indicate churn rate.

8. This code creates a scatter plot showing the relationship between the total number of services a customer uses (total_services) and their average monthly spend (avg_monthly_spend). Each point is colored based on the customer's churn status (Churn), using a continuous Viridis color scale to highlight churn intensity. The plot helps visualize how service adoption and spending relate to the likelihood of customers leaving.