TASK SHEET

1. Plot a 3D scatter plot showing the relationship between math, reading, and writing scores, with the marker size representing the student's overall score (average of the three scores) and color representing their test preparation completion status. Implement a slider to dynamically adjust the transparency of the markers based on the test preparation completion status.
2. Create a dendrogram showing the hierarchical clustering of students based on their scores, with the color representing their lunch type, the line style representing their race/ethnicity, and different levels of clustering annotated with labels. Implement interactive tooltips to display additional information about each student upon mouse hover.
3. Generate a violin plot for math scores grouped by lunch types and parental level of education, with the width of the violins scaled by the number of students in each group. Overlay a swarm plot showing individual data points and implement interactivity to allow users to select specific groups for closer examination.
4. Plot a ternary contour plot showing the density of students based on their average scores in math, reading, and writing, with different contour levels for different quartiles of student density. Add labels indicating the quartiles and implement sliders to dynamically adjust the quartile levels.
5. Create a radar chart comparing the average scores for each subject (math, reading, writing) across different race/ethnicity groups. Represent the proportion of students in each group with the radar area and annotate the chart with exact average scores. Implement dropdown menus to switch between different race/ethnicity groups for comparison.
6. Generate a parallel coordinates plot to visualize the distribution of scores across different subjects for each student. Color the lines based on the test preparation completion status and implement brushing functionality to allow users to select and highlight specific students.
7. Plot a Sankey diagram illustrating the flow of students from different parental levels of education through different race/ethnicity groups. Represent the number of students in each group with the width of the flow and color the flows based on the test preparation completion status.
8. Create a heatmap showing the correlation matrix between math, reading, and writing scores. Annotate the heatmap with correlation coefficients and implement a colorbar to indicate the correlation scale.
9. Generate a dendrogram showing the hierarchical clustering of students based on their scores, with the color representing their test preparation completion status and the line style representing their gender. Add interactive checkboxes to allow users to toggle the visibility of different categories.
10. Plot a chord diagram showing the relationships between different parental levels of education based on their average scores. Use chord thickness to represent the strength of the relationship, color to represent the average score, and annotations to display the exact average score.
11. Create a contour plot showing the density of math scores based on reading scores, with a kernel density estimate overlaid. Include contour lines to represent different percentile levels of score density and color the contours based on race/ethnicity.
12. Generate a scatter plot matrix showing the relationships between math, reading, and writing scores, with KDE plots for each variable along the diagonal and hexagonal binning for density visualization. Implement dropdown menus to switch between different subsets of data for comparison.
13. Plot a 3D surface plot showing the relationship between math scores, reading scores, and writing scores, with the color representing the average score across the three subjects and transparency representing the proportion of students in each score combination.
14. Create a streamplot showing the change in scores over time for students who completed the test preparation course, with time represented by lunch type and stream thickness representing the magnitude of score change. Use arrows to indicate the direction of change and color the streams based on race/ethnicity.
15. Generate a network graph showing the connections between students who have similar score distributions. Represent the number of students with node size, color the edges based on gender, and implement interactive tooltips to display additional information about each student upon mouse hover.