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), color representing their race/ethnicity, and markers styled with a combination of 3D shapes and textures.
2. Create a dendrogram showing the hierarchical clustering of students based on their scores, with the color representing their parental level of education, line style representing their lunch type, different levels of clustering annotated with labels, and implement tooltips to display additional student information upon hovering.
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, overlaid with a swarm plot showing individual data points, annotations indicating statistical measures (e.g., mean, median), and a hover effect to highlight specific data points.
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, labels indicating the quartiles, a legend explaining the contour levels, and interactive 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, with the radar area representing the proportion of students in each group, annotations showing the exact average scores, a legend explaining the groups, and dropdown menus to switch between different race/ethnicity groups for comparison.
6. Generate a network graph showing the connections between students who have similar score distributions, with node size representing the number of students, edge color representing their parental level of education, edge thickness representing the similarity between students, nodes styled with varying shapes based on their lunch type, and implement zoom and pan functionalities for exploration.
7. Plot 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, arrows indicating the direction of change, streamlines styled with different patterns based on the student's gender, and a colorbar indicating the score change scale.
8. Create a parallel coordinates plot to visualize the distribution of scores across different subjects for each student, with lines colored by their test preparation completion status, transparency representing their race/ethnicity, annotations indicating the student's ID, and interactive brushing to select and highlight specific data points.
9. Generate a Sankey diagram illustrating the flow of students from different parental levels of education through different race/ethnicity groups, with the width of the flow representing the number of students in each group, color representing their test preparation completion status, annotations indicating the exact counts, and interactive tooltips for detailed information.
10. 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, transparency representing the proportion of students in each score combination, annotations showing the exact average score, a colorbar indicating the score scale, and interactive rotation and zoom functionalities for exploration.
11. Create a heatmap showing the correlation matrix between math, reading, and writing scores, with annotations displaying the correlation coefficients, color intensity representing the strength of correlation, a colorbar indicating the correlation scale, and interactive tooltips for detailed information.
12. Generate a dendrogram showing the hierarchical clustering of students based on their scores, with the color representing their test preparation completion status, the line style representing their gender, and implement interactive checkboxes to toggle the visibility of different clusters and axes.
13. Plot a chord diagram showing the relationships between different parental levels of education based on their average scores, with the chord thickness representing the strength of the relationship, color representing the average score, annotations showing the exact average score, and interactive hover effects for additional information.
14. Create a contour plot showing the density of math scores based on reading scores, with a kernel density estimate overlaid, contour lines representing different percentile levels of score density, color representing the race/ethnicity, and interactive sliders to adjust the contour levels and bandwidth.
15. Generate a scatter plot matrix showing the relationships between math, reading, and writing scores, with KDE plots for each variable along the diagonal, hexagonal binning for density visualization, annotations showing the exact average scores for each variable, and interactive tooltips for detailed information.