The cleaned data is saved to a CSV file, and five different types of visualizations are created to explore the relationships between different variables in the data.

The first plot shows the relationship between writing scores and math scores by gender. This plot helps to identify any differences in performance between genders in these two subjects. The plot uses a scatter plot with color-coded points to represent gender.

The second plot shows the distribution of reading scores by parental level of education using box plots. This plot helps to identify any differences in performance based on the education level of parents. The plot uses box plots with fill colors to represent different levels of parental education.

The third plot shows the relationship between test preparation courses and race/ethnicity using stacked bar charts. This plot helps to identify the prevalence of test preparation courses by race/ethnicity. The plot uses stacked bars with different fill colors to represent test preparation courses and different categories of race/ethnicity.

The fourth plot shows the density of reading scores by gender. This plot helps to identify the distribution of reading scores by gender. The plot uses a density plot with color-coded lines to represent gender.

The fifth plot shows the relationship between lunch and parental level of education using stacked bar charts. This plot helps to identify the prevalence of free/reduced-price lunch by parental level of education. The plot uses stacked bars with different fill colors to represent lunch status and different levels of parental education.

Overall, each of these visualizations helps to identify different relationships and patterns in the data, and each is chosen based on the types of variables being explored and the insights that are desired. For example, scatter plots are useful for identifying relationships between two continuous variables, while box plots are useful for identifying differences in distributions between groups. Stacked bar charts are useful for comparing proportions of categorical variables, while density plots are useful for identifying the distribution of a single continuous variable.