**Exploring Data Visualization and Manipulation in MATLAB**

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**Introduction:**

In the realm of data analysis and visualization, MATLAB provides a powerful platform for exploring and manipulating data. This essay focuses on a MATLAB code snippet that demonstrates data import, plotting, data salting, and data smoothing techniques. The code showcases the use of MATLAB functions and syntax to perform these operations. Let's delve into the code and understand its functionality.

**Code Overview:**

The code begins by importing the data from a CSV file using the "readmatrix" function. The imported data is stored in the variable "data." Next, the code extracts the x and y values from the imported data using indexing. The x values are stored in the variable "x," and the y values are stored in the variable "y."

**Plotting Data:**

The original data is plotted using the "plot" function. A new figure is created, and the "plot" function is called with the x and y values as arguments. This generates a plot of the original data.

**Salting Data:**

To introduce variability into the data, the code adds random noise to the y values. The "salted\_y" variable is created by adding a normally distributed random noise to the original y values using the "randn" function. The noise is scaled by a factor of 0.1.

**Smoothing Data:**

The "smoothed\_y" variable is created by applying a moving average filter to the "salted\_y" data using the "movmean" function. The filter size is specified as 5, indicating that the average is taken over a window of size 5.

**Plotting Salted and Smoothed Data:**

A new figure is created to plot the salted and smoothed data. The "plot" function is called twice, once with the x and "salted\_y" values, and once with the x and "smoothed\_y" values. The 'b' and 'r' arguments specify the colors of the lines for the salted and smoothed data, respectively. The "legend" function is used to add a legend to the plot, labeling the salted and smoothed data.

**Conclusion:**

This MATLAB code snippet demonstrates the capabilities of MATLAB in importing, visualizing, and manipulating data. By leveraging MATLAB's functions and syntax, the code successfully imports data from a CSV file, plots the original data, introduces variability through data salting, and applies a moving average filter for data smoothing. These techniques provide insights into the patterns, trends, and statistical properties of the dataset. MATLAB's versatility in data analysis and visualization empowers researchers, engineers, and scientists to explore, analyze, and present data in a meaningful way, facilitating data-driven decision-making and analysis in various domains.