Here's a summary of the actions and steps involved in the final project

### Project Overview:

* + The project focuses on analysing used car auction data to find trends in the auto industry.
  + Specific aspects of the data to be analyzed include make, model, trim, body style, transmission, auction location, condition, odometer, colour, interior, estimated value (M.R), and selling price.

### Client Email:

* + The client, Aaron Otto, VP of Fleet Management, requested an analysis of auto procurement for their fleet of service vehicles.
  + The client is particularly interested in finding affordable Ford F-150 trucks.

### Key Objectives:

* + The key objectives for the project are:
    - Reading and manipulating data with pandas.
    - Building summary charts with Matplotlib and Seaborn.
    - Leveraging advanced Seaborn chart types to mine insights from the data and make decisions.
    - Analyze auto procurement for a fleet of service vehicles.
    - Explore relationships in the data using Python libraries like NumPy, Pandas, Matplotlib, and Seaborn.

### Data Preprocessing:

* + Import necessary libraries, including NumPy, pandas, matplotlib, and Seaborn.
  + Read in the car prices CSV file, skipping any problematic lines.
  + Display information about the dataset using the **info** and **describe** methods.

### Exploring Numeric Variable Relationships:

* + Create a pair plot to visualise relationships between numeric variables.
  + Analyze relationships between selling price and MMR (estimated value), and selling price and the year of manufacture.

### Correlation Analysis:

* + Build a heatmap to visualize correlations between numeric variables.
  + Analyze correlations, such as the negative correlation between year and condition and year and odometer.

### Brand Value Analysis:

* + Filter the data for specific brands (e.g., BMW, Toyota, Chevy).
  + Build linear relationship plots comparing odometer and selling price for different brands.

### Categorical Variable Relationships:

* + Convert the condition variable into increments of 0.5.
  + Create a pivot table to analyze the relationship between brand, condition, and price.
  + Visualize these relationships using heatmaps.

### Ford F-150 Deep Dive:

* + Focus on analyzing Ford F-150 trucks.
  + Examine the distribution of selling prices for Ford F-150 trucks.
  + Break down the analysis by trim levels (XL, XLT, Platinum, SV Raptor).
  + Explore the relationship between condition and selling price for different trim levels.

### Identifying Deals:

* + Create a column called "Difference to MMR" to calculate the difference between selling price and the recommended price.
  + Plot this difference by car color to identify colors that sell for more or less than the recommended price.
  + Analyze trim levels by condition to identify the highest and lowest prices.

### Focusing on XLT Trim Level:

* + Filter data for XLT trim levels with a condition greater than 3.5.
  + Analyze states in the United States where cars tend to sell for less than the recommended price and have a reasonable volume of sales.
  + Calculate the average difference in MMR for the selected state to determine if there's sufficient volume for bulk purchases.