**Technical Statement**

**Project Title**: Analyzing the Impact of Car Features on Price and Profitability  
**Prepared by**: Arpan Paul

**GitHub Link: https://github.com/Hrick91/Analyzing-the-Impact-of-Car-Features-on-Price-and-Profitability**

**Tools and Software Used**

I utilized **MS Excel 2019** for the entire analysis. Some chart types, such as bubble charts, were not supported in this version. Hence, I replaced them with bar charts for better visualization and compatibility.

**Approach and Solutions**

**Task 1: How does the popularity of a car model vary across different market categories?**

1. **Data Preparation**:
   * Cleaned the dataset by replacing blank data with "N/A". For numerical fields, missing values were set to 0 for consistency in analysis.
2. **Analysis and Visualization**:
   * Created a **pivot table** to display the number of car models in each market category along with their total popularity scores.
   * Used a **combo chart** to visualize the relationship between market categories and popularity.

**Task 2: What is the relationship between a car's engine power and its price?**

1. **Scatter Plot and Trendline**:
   * Plotted **Engine HP (Horsepower)** on the X-axis and **MSRP (Price)** on the Y-axis using a scatter plot.
   * Added a trendline to depict the correlation and general relationship between these variables.

**Task 3: Which car features are most important in determining a car's price?**

1. **Regression Analysis**:
   * Conducted regression analysis to identify features with the strongest relationship to price.
   * Visualized the regression coefficients using a **bar chart**, highlighting the impact of each variable on pricing.

**Task 4: How does the average price of a car vary across different manufacturers?**

1. **Pivot Table**:
   * Calculated the **average MSRP** for each manufacturer using a pivot table.
2. **Visualization**:
   * Created a **bar chart** to compare manufacturers based on their average car prices.

**Task 5: What is the relationship between fuel efficiency and the number of cylinders in a car's engine?**

1. **Scatter Plot with Trendline**:
   * Created a scatter plot with the **number of cylinders** on the X-axis and **Highway MPG** on the Y-axis.
   * Added a trendline to estimate the slope and understand the strength of the relationship.
2. **Correlation Coefficient**:
   * Calculated the correlation coefficient to quantify the relationship between these variables.

**Interactive Dashboard**

1. **Filters and Slicers**:
   * Added interactive slicers for brand, body style, and fuel type to allow dynamic exploration of the data.
2. **Visualizations**:
   * Replaced unsupported bubble charts with **bar charts** to maintain compatibility.
   * Used stacked and clustered column charts to analyze price distributions, feature impacts, and manufacturer trends.

**Challenges and Adjustments**

* **Missing Bubble Chart Feature**: Due to the limitations of MS Excel 2019, I substituted bubble charts with bar charts for clarity.
* **Data Cleaning**: Ensured the dataset was free from blank values to maintain the integrity of calculations.