**1. Research Topic and Questions**

**Research Topic**

**The Influence of Demographics and Financial Factors on Car Purchase Price Among Indian Automobile Buyers**

**Research Questions and Hypotheses**

**RQ1: Does the type of profession (Salaried vs. Business) significantly influence the average car price?**

* **Null Hypothesis (H₀1)**: Profession does not significantly affect car price.
* **Alternative Hypothesis (Hₐ1)**: Profession significantly affects car price.

**RQ2: Is there a significant difference in car price based on marital status (Married vs. Single)?**

* **Null Hypothesis (H₀2)**: Marital status does not significantly influence car price.
* **Alternative Hypothesis (Hₐ2)**: Marital status significantly influences car price.

**RQ3: Does total salary significantly predict car price, while controlling for other factors such as profession, education level, and loan status?**

* **Null Hypothesis (H₀3)**: Total salary and other factors do not significantly predict car price.
* **Alternative Hypothesis (Hₐ3)**: Total salary and other factors significantly predict car price.

**2. Descriptive Statistics**

**Key Variables to Summarize:**

* **Age**, **Total Salary**, **Car Price** (continuous variables):
  + Mean, median, mode, standard deviation, and range.
* **Categorical Variables** (e.g., Profession, Marital Status, Education Level):
  + Frequency distributions.

**Steps in Excel:**

1. Use **Data Analysis ToolPak > Descriptive Statistics** to compute:
   * Mean, standard deviation, median, range, and more for continuous variables.
2. Use **COUNTIF** or pivot tables for categorical data frequency distribution.

**3. One-Way ANOVA**

**RQ1: Influence of Profession on Car Price**

**Objective**: Compare the average car prices of salaried vs. business professionals.

**Steps in Excel:**

1. Organize your data:
   * Create two columns: One for "Salaried" car prices, another for "Business" car prices.
2. Go to **Data > Data Analysis > ANOVA: Single Factor**:
   * Input Range: Include the two groups (Salaried and Business car prices).
   * Output: Select a range for displaying results.
3. Interpret Results:
   * Look for **p-value**: If < 0.05, reject the null hypothesis (H₀1).

**4. Independent Samples T-Test**

**RQ2: Influence of Marital Status on Car Price**

**Objective**: Determine if car prices differ significantly between married and single buyers.

**Steps in Excel:**

1. Organize data:
   * Separate car prices into two groups: "Married" and "Single".
2. Go to **Data > Data Analysis > t-Test: Two-Sample Assuming Equal Variances**:
   * Variable 1 Range: Married car prices.
   * Variable 2 Range: Single car prices.
   * Output: Select a range for displaying results.
3. Interpret Results:
   * Check the **t-statistic** and **p-value**: If p-value < 0.05, reject H₀2.

**5. Multiple Linear Regression**

**RQ3: Predicting Car Price Using Total Salary and Other Variables**

**Objective**: Assess how demographic and financial factors influence car price.

**Variables:**

* **Dependent Variable**: Car Price
* **Independent Variables**: Total Salary, Profession, Education Level, Personal Loan Status, House Loan Status.

**Steps in Excel:**

1. Ensure all independent variables are coded numerically:
   * Profession: 1 (Salaried), 0 (Business)
   * Education: 1 (Post Graduate), 0 (Graduate), etc.
2. Go to **Data > Data Analysis > Regression**:
   * **Y Range**: Select the column for car price.
   * **X Range**: Select columns for Total Salary, Profession, Education, Personal Loan, House Loan.
   * Check **Labels** if headers are included.
   * Output: Select a range for the regression output.
3. Interpret Results:
   * **R-squared**: Indicates how well the model explains car price variability.
   * **Coefficients**: Show the influence of each variable on car price.
   * **p-values**: Identify statistically significant predictors (p < 0.05).

**6. Analysis Outputs and Interpretation**

**Descriptive Statistics:**

* Summarize key findings from the descriptive statistics (e.g., average car price, total salary).

**One-Way ANOVA:**

* Report whether the p-value shows a significant difference in car prices between salaried and business professionals.

**T-Test:**

* State whether marital status significantly affects car price.

**Multiple Regression:**

* Highlight which variables (e.g., total salary, profession) significantly predict car price.