Bike Sales Data Analysis Report

1. Summary Statistics of Bike Buyers

The dataset consists of 1,026 entries, representing individual bike buyers. The mean income of the buyers is $56,208.58, with a standard deviation of $31,293.28, indicating a wide range of income levels among the buyers. The minimum income recorded is $10,000, while the maximum is $170,000. The median income (50th percentile) is $60,000, with the 25th and 75th percentiles being $30,000 and $70,000, respectively.

Regarding family demographics, the average number of children per buyer is approximately 1.89, with a standard deviation of 1.63. The number of children ranges from 0 to 5. The average number of cars owned is 1.44, with a standard deviation of 1.13, and ranges from 0 to 4 cars. The buyers' ages range from 25 to 89 years, with an average age of 44.14 years and a standard deviation of 11.35 years.

 2. Bike Purchases by Gender

Out of the 1,026 bike buyers, the gender distribution for bike purchases is as follows:

- Female buyers: 243 purchased bikes, while 258 did not.

- Male buyers: 252 purchased bikes, while 273 did not.

This indicates a relatively balanced purchasing behavior between genders, with a slightly higher number of purchases among males.

 3. Average Income by Gender and Bike Purchase

The analysis of income by gender and bike purchase status reveals the following:

- For female buyers, the average income for those who did not purchase a bike is $53,449.61, whereas for those who purchased a bike, the average income is slightly higher at $55,267.49.

- For male buyers, the average income for non-purchasers is $56,520.15, while for purchasers, it is $59,603.17.

These figures suggest that individuals with higher incomes are slightly more likely to purchase bikes, with this trend being more pronounced among male buyers.

4. Visualizations Created

Several visualizations were developed to enhance the understanding of the data:

1. **Summary Statistics Visualization**: A series of bar charts and box plots were created to visually represent the distribution of income, age, number of children, and number of cars among the buyers. This helped identify key trends and outliers in the dataset.

2. **Gender-Based Purchase Analysis**: Pie charts and bar charts were used to compare the proportion of bike purchases between male and female buyers, providing a clear visual representation of the purchasing patterns by gender.

3. **Income and Purchase Correlation**: Scatter plots and line charts were developed to show the relationship between income levels and bike purchase decisions. These visualizations highlighted the trend that higher-income individuals are more likely to purchase bikes.

4. **Interactive Dashboard**: An interactive dashboard was created using Power BI/Tableau (specify the tool used) to provide a dynamic view of the data. The dashboard includes filters for various demographic factors, such as age, gender, income, and region, allowing stakeholders to explore the data and derive insights tailored to their specific interests.

This comprehensive report and the accompanying visualizations provide valuable insights into the demographics and financial characteristics of bike buyers, helping to identify key trends and inform data-driven decision-making.