**Project Overview**

This project involves cleaning, analyzing, and visualizing customer data to understand bike purchase patterns. The dataset includes customer demographics, income levels, commute distance, and other attributes that influence purchasing behavior.

**Objectives**

* Clean and preprocess the dataset.
* Create pivot tables to summarize key insights.
* Design a dashboard with graphs to visualize customer trends.

**Data Source**

The dataset used in this project was obtained from the description of a YouTube video by Alex the Analyst.

**Dataset Description**

The data was sourced from an Excel spreadsheet containing customer demographic and purchase information, originally featured in a YouTube tutorial by Alex the Analyst. The dataset included columns such as ID, Marital Status, Gender, Income, Children, Education, Occupation, Home Owner, Cars, Commute Distance, Region, Age, and Purchased Bike.

**Data Cleaning Steps**

* Removed duplicate entries.
* Standardized Marital Status to "Married" or "Single".
* Standardized Gender to "Male" or "Female".
* Removed "$" from Income and formatted it as a number.
* Standardized Commute Distance into predefined ranges (0-1 Miles, 1-2 Miles, etc.).
* Added Age Range categories: "Adolescent," "Middle Age," and "Old".
* Ensured numerical columns (Income, Children, Cars, Age) were formatted correctly.

**Pivot Tables & Insights**

* Income Analysis: Average income was calculated based on gender and purchase status. Males and females had similar income levels, with minor variations in bike purchases.
* Commute Distance vs. Purchase: Customers commuting 0-5 miles were more likely to purchase bikes, with a decline for commutes over 10 miles.
* Age Range vs. Purchase: Middle-aged customers were the largest group purchasing bikes, while adolescents had the least.

**Key Findings**

* Customers with commute distances of 0-1 miles and 5-10 miles have the highest purchase rates.
* Middle-aged customers are the primary bike buyers.
* Male customers have a higher average income than females.
* Customers who purchased a bike generally have a higher income than those who didn't.

**Dashboard Overview**

The dashboard includes four interactive charts:

* Purchases by Gender: Bar chart with a slicer to filter by marital status.
* Income Distribution: Bar chart showing average income, with a slicer for gender.
* Purchases by Commute Distance: Bar chart displaying purchases based on commute range, with a slicer for region.
* Purchases by Age: Bar chart showing purchases by age range, with a slicer for occupation.

**Conclusion**

This project highlights factors influencing bike purchases, including income, commute distance, and age. The interactive dashboard allows users to explore trends and patterns effectively.

**How to Use**

1. Open the Excel file and navigate to the Pivot Table and Dashboard sheets.

2. Modify filters in pivot tables to analyze different factors.

3. Use the dashboard for a quick visual summary of insights.



