Bike Sales Analysis Project Report

- **Project Title** : Bike Sales Analysis
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- **Company** : Labmentix
- **Date** : 20.07.2025
- **Tools Used** : EXCEL

PROJECT SUMMARY

The Bike Sales Analysis project is designed to explore key factors that impact customers' decisions to purchase bicycles. By leveraging Excel tools like PivotTables, slicers, charts, conditional formatting, and KPI cards, we built a clear and interactive dashboard that uncovers valuable insights. The project helps identify which customer groups are more likely to purchase bikes based on attributes like gender, income, marital status, commute distance, and region. This analysis supports targeted marketing, improved customer segmentation, and smarter business strategies.

This project aims to analyze customer behavior and demographics that influence bike purchasing decisions. Using Excel as a tool, we created a dynamic dashboard that provides meaningful insights through charts, filters, and KPIs. The goal is to help stakeholders understand the patterns behind customer choices and support data-driven marketing and sales strategies.

The dashboard includes slicers for filters such as **Region, Gender, Education, Marital Status**, and **Commute Distance**, and charts that compare **Income**, **Age Bracket**, and **Bike Purchase Status**. This visual approach makes it easy to explore trends and make strategic decisions.

DATA DESCRIPTION

The dataset consists of customer-level information that helps explore the correlation between demographic features and bike purchases.

Key columns in the dataset include:

- **Customer ID** – Unique identifier for each customer

- **Gender** – Male or Female

- **Age Bracket** – Age group of the customer (e.g., Adolescent, Middle Age, Old)

- **Marital Status** – Whether the customer is Single or Married

- **Region** – Geographic region (Europe, North America, etc.)

- **Education** – Education level (High School, Bachelors, etc.)

- **Income** – Annual income of the customer

- **Commute Distance** – Distance the customer travels daily

- **Purchased Bike** – Whether the customer bought a bike (Yes/No)

DATA PREPARATION

Before beginning the analysis, the dataset was thoroughly prepared to ensure that all data used in the dashboard was accurate, clean, and ready for visualization. The following steps were taken during the data preparation phase:

1. Removing Duplicates

We checked the dataset for any duplicate customer records based on the Customer ID and other key fields. Duplicate entries were removed to avoid double-counting and ensure accuracy in summaries and calculations.

2. Handling Missing Values

The dataset was reviewed for any missing or blank values, especially in critical columns like Income, Education, or Purchased Bike. In our case, most fields were complete, but we verified this to maintain data integrity.

3. Standardizing Text Entries

To maintain consistency, categorical values such as Yes/No, Married/Single, and Region names were standardized (e.g., ensuring all were in title case and free of extra spaces). This helped in grouping and filtering during PivotTable creation.

4. Verifying Data Types

We ensured that each column had the correct data type:

- **Income** was formatted as a number with proper currency formatting.

- **Age** and **Commute Distance** were confirmed as numerical or categorized correctly.

- **Text columns** (like Region, Education) were treated as text for proper grouping in PivotTables.
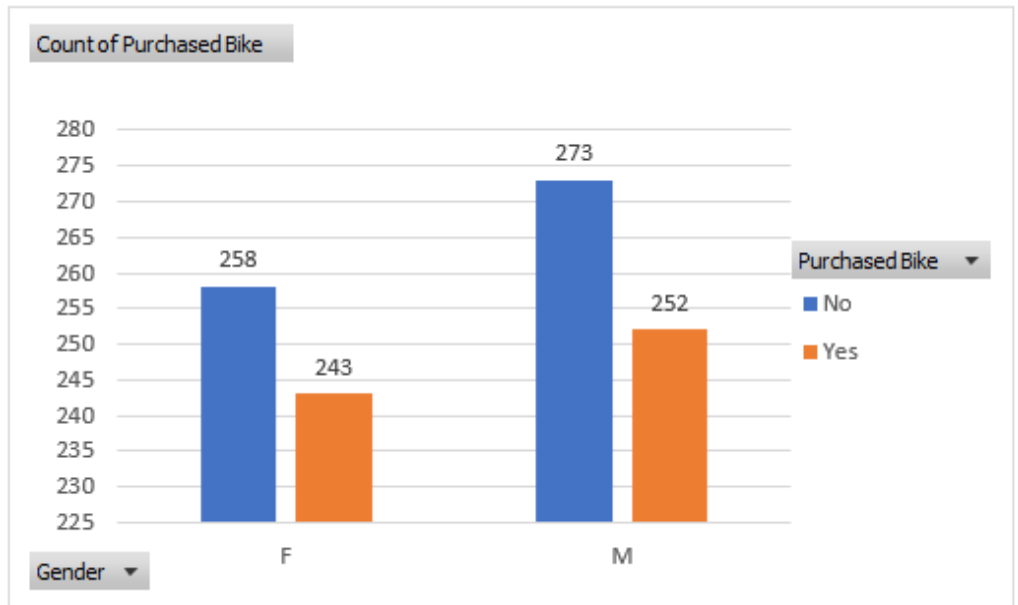
5. Creating Derived Fields (if needed)

We added helpful grouping fields like:

- **Age Brackets** (e.g., Young, Middle-aged, Senior) from raw age values.

- **Income Ranges** to analyze customer segments by income level.

VISUAL INSIGHTS

Visual Analytics:

1. Gender vs. Bike Purchase

After analyzing the data based on gender and bike purchase behavior, we observed the following:

- **Male customers show a higher count of bike purchases** compared to female customers.
- A significant portion of female customers chose not to purchase a bike, indicating a possible difference in preference, commuting habits, or lifestyle factors.
- This gap may reflect marketing, product design, or accessibility issues that could be addressed to better engage female customers.

Insight: Bike Purchase by Gender – Bachelor Occupation
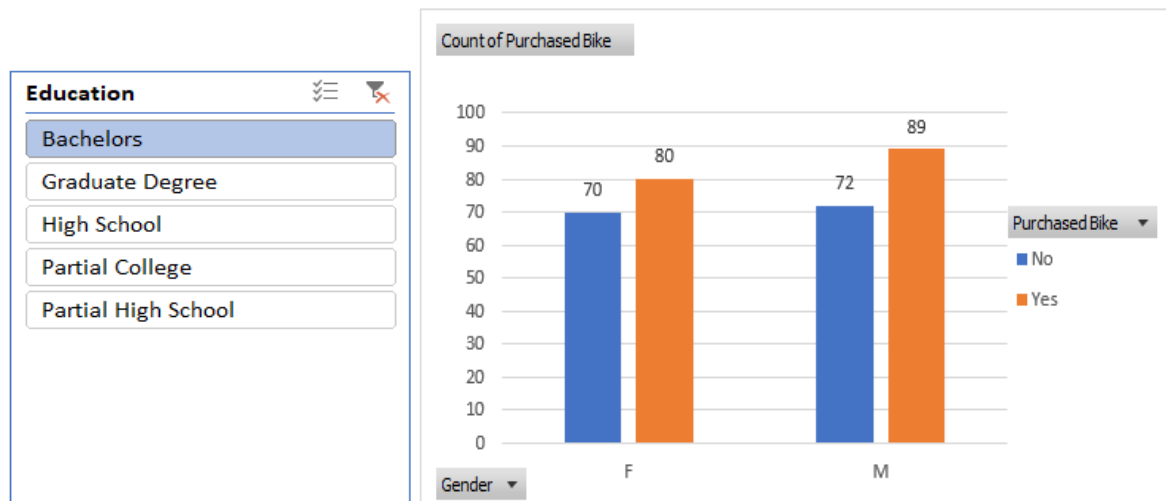

When we filtered the data specifically for customers with a **"Bachelor" occupation**, we found:

- **Male customers with a bachelor occupation purchase bikes more frequently** than female counterparts in the same group.

- Although both genders are represented among bachelor professionals, the **purchase rate among males remains significantly higher**.

- This pattern is consistent with the overall trend, suggesting that occupation alone may not fully explain the gender gap in bike purchases.

Business Recommendation:

Even within the same occupation, gender-based preferences likely affect decisions.
Focused marketing campaigns toward female professionals (e.g., showcasing health, affordability, or commuting ease) may help improve engagement and sales in that segment.

2. Marital Status vs. Total Number of Cars Owned
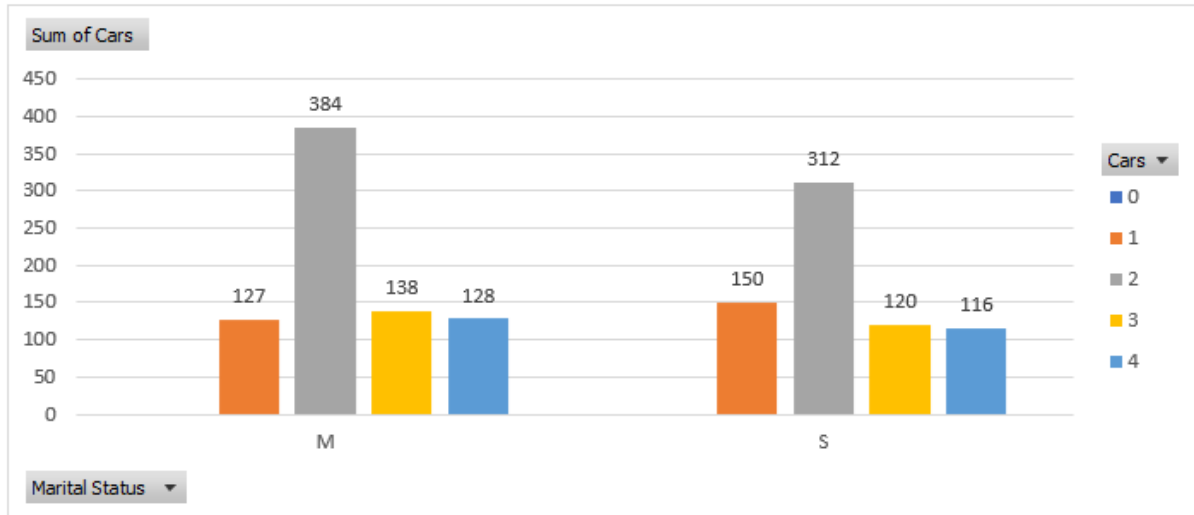
- Married customers own significantly more cars on average compared to single customers.

- This suggests that married individuals or families may have higher transportation needs, possibly due to family responsibilities, shared commuting, or lifestyle differences.

- On the other hand, single customers tend to own fewer cars, which could be linked to simpler transportation needs, financial priorities, or urban living where car ownership is less necessary.

**Insight: Marital Status vs. Total Cars – Filtered for Professionals**
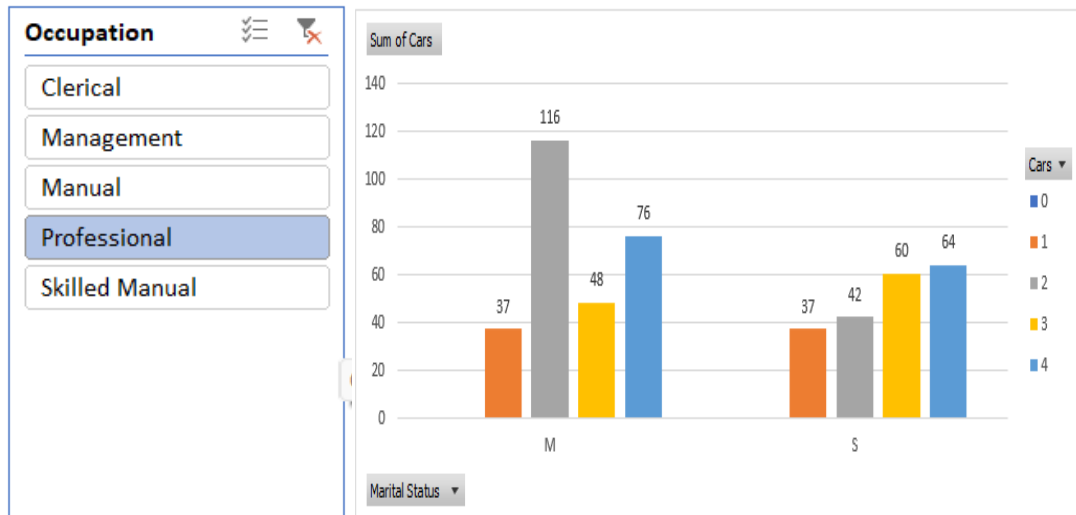
- Among professional customers, **married individuals own significantly more cars** than single individuals.

- This indicates that even within the same occupation, **marital status has a strong influence on car ownership**.

- Married professionals likely have higher transportation needs — possibly due to family responsibilities, longer commutes, or dual-income households enabling multiple vehicles.

- **Single professionals**, in contrast, tend to own fewer cars, suggesting simpler mobility requirements or a preference for alternative transportation.

Business Recommendation:

- For **married professionals**, positioning bikes as a **secondary or leisure vehicle** (for fitness, weekend rides, or eco-friendly travel) may resonate well.

- For **single professionals**, highlight the **cost-saving**, **urban mobility**, and **health benefits** of bike ownership to position it as a primary, practical mode of transport.

- Tailored marketing for both segments — based on **lifestyle and marital status** — can help improve engagement and conversion.

3. Bike Purchase Trends by Region
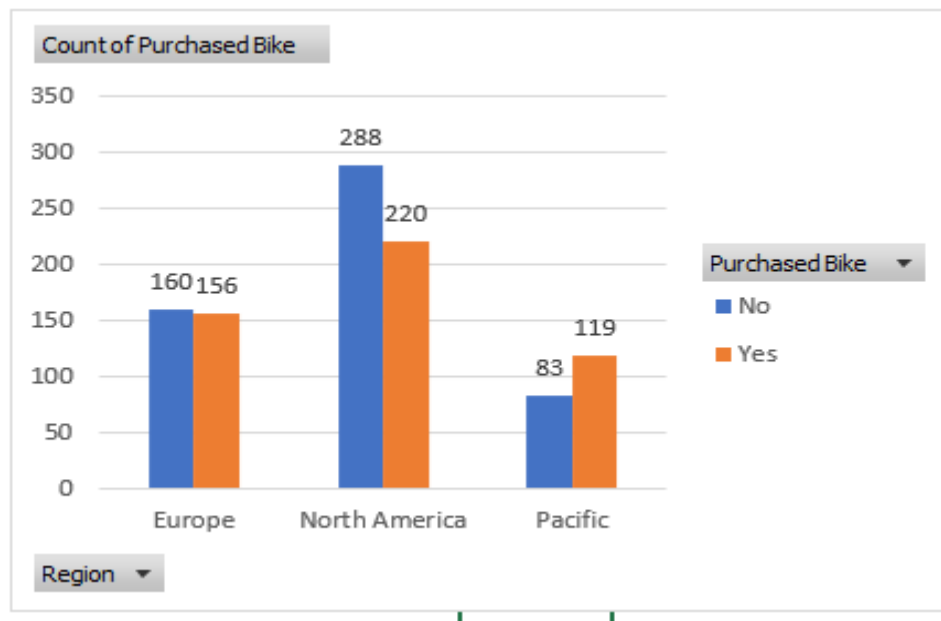
- **North America** has the highest number of total respondents, but **more people did not purchase bikes (288)** compared to those who did (220).
- In **Europe**, the numbers of purchasers (156) and non-purchasers (160) are nearly equal, indicating a **balanced market**.
- In the **Pacific region**, **more people purchased bikes (119)** than those who didn't (83), which suggests **higher conversion or interest in biking**.

Insight: Bike Purchase Behaviour in North America
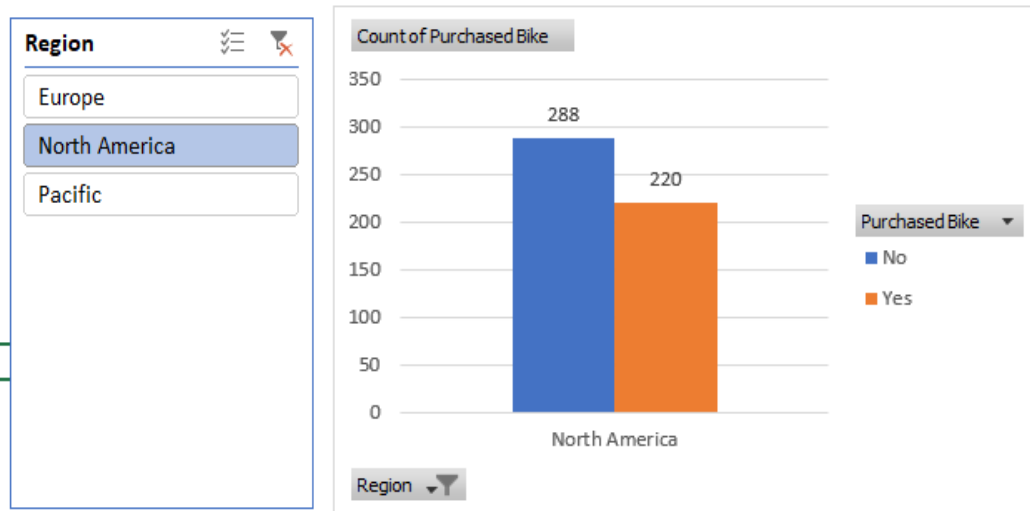
Total Non-Purchasers: 288

Total Purchasers: 220

A significant portion of individuals in **North America have *not* purchased bikes**.

However, the number of purchasers (220) is still **relatively high**, indicating a **strong potential market**.

Business Recommendations :

- **Target Non-Purchasers (288):**

   Run campaigns to **understand and remove barriers** (e.g., cost, commuting habits, lack of awareness).

   Offer **incentives like trial periods, EMI options, or discounts** to convert them.

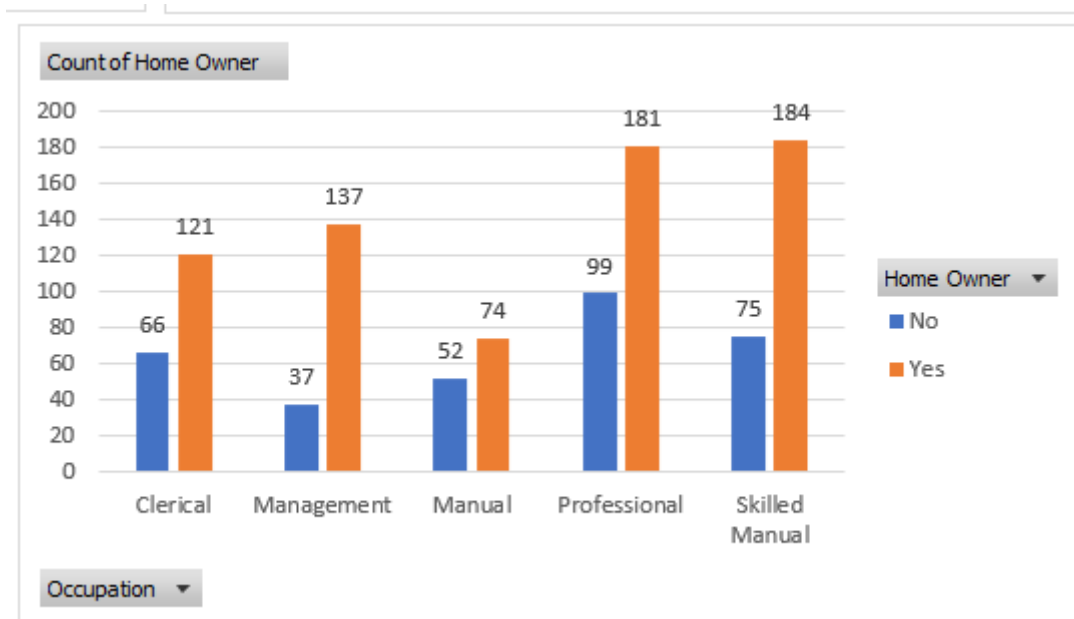- **Strengthen Engagement with Purchasers (220):**

   Launch **loyalty programs, accessories, or bike maintenance services**.

   Promote **testimonials or stories from current users** to build trust and influence others.

- **Segment by Demographics:**

   Analyze further by **age, gender, marital status, or income** to fine-tune campaigns.

4. Home Ownership by Occupation

- Skilled Manual and Professional workers have the highest number of homeowners — 184 and 181 respectively — indicating greater financial stability or preference for asset ownership in these occupations.
- Clerical employees show a notable number of homeowners (121) but also have a relatively high number of non-homeowners (66), suggesting varied financial standing within this group.
- Manual workers have the lowest home ownership (74 yes vs 52 no), possibly due to lower income levels or job insecurity.
- Management roles, despite being high-income professions, have fewer total individuals (137 homeowners), but the ownership ratio is strong compared to non-owners (137 vs 37).
- Across all occupations, homeowners significantly outnumber non-homeowners, which may reflect a financially stable customer base.

## Insights: Occupation vs Home Ownership by Pacific Region
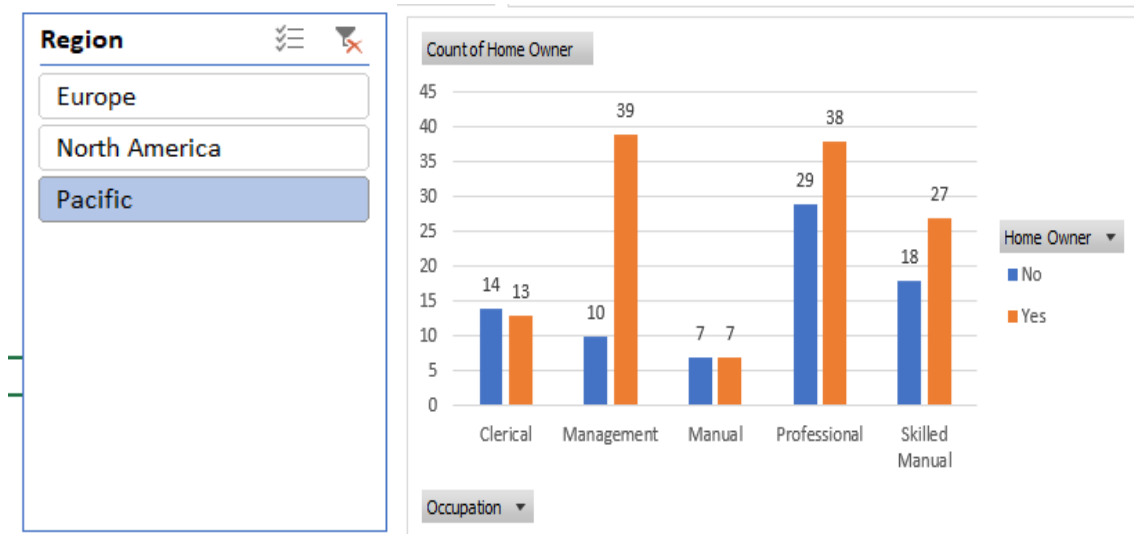
- **Management professionals** have the **highest home ownership** count (39), with a low number of non-homeowners (10). This suggests strong financial capacity and housing stability among this group.
- **Professional workers** follow closely with 38 homeowners and 29 non-homeowners — indicating a fairly balanced housing status.
- **Skilled Manual workers** show a notable homeowner group (27), though a significant portion (18) still doesn't own homes — suggesting a moderate financial standing.
- **Clerical employees** have an almost **equal split** between homeowners (13) and non-homeowners (14), showing financial variation within this group.
- **Manual laborers** have the **lowest home ownership** (7 homeowners and 7 non-homeowners), indicating either limited financial resources or less stability.

Business Recommendations:

- **Target marketing efforts** (e.g., bike loans, home financing offers) toward **Skilled Manual and Professional groups** — they're more likely to own homes and afford premium products.

- **Design affordable, EMI-friendly bike models** for **Manual workers**, who show lower home ownership and may benefit from budget-conscious options.

- For **Clerical workers**, consider **flexible payment plans**, as this group shows a mixed financial profile.

5. Car Ownership Distribution by Number of Children
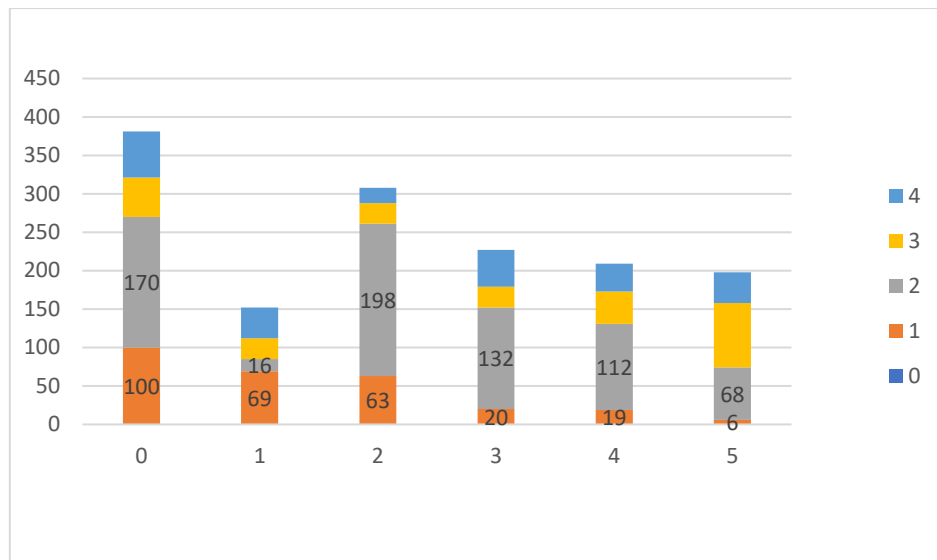
- **Childless households own the most cars overall**, especially 2–4 vehicles.
- **Families with 1–2 children prefer 2 cars**, indicating balanced lifestyle and commuting needs.
- **Households with 4–5 children show a decline in overall car ownership**, possibly due to financial constraints or reliance on shared transportation.
- **Ownership of 3–4 cars remains fairly stable** even in larger families, suggesting a small segment of financially well-off large families.

Insights: Car Ownership by Number of Children (Professionals Only)
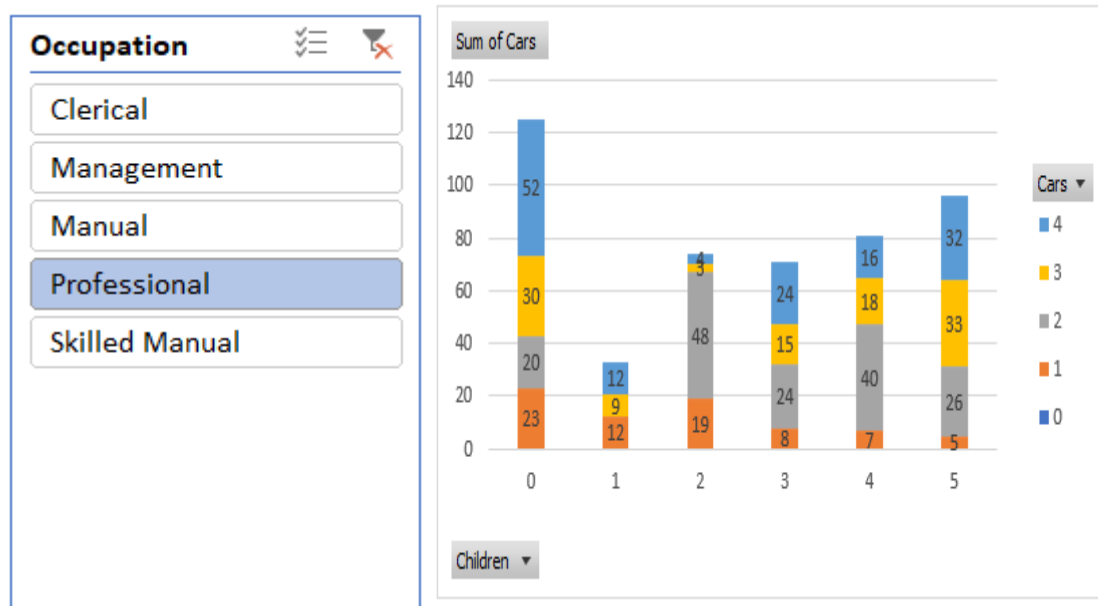
- **Professionals without children own the most cars overall:**
  Professionals with 0 children have the highest total car ownership (sum = 186).
  Notably, many of them own 3 (30) and 4 cars (52), showing strong financial capacity.
- **High number of 2-car households among professionals with 2 children:**
  Professionals with 2 children own 48 cars in the 2-car segment, indicating a typical
  middle-income family car pattern.
- **4-car ownership increases significantly with more children:**
  Professionals with 4 (16 cars) and 5 children (32 cars) show a rising trend in 4-car
  ownership, suggesting the need for multiple vehicles in larger families.
- **1-child professionals show moderate car ownership:**
  Professionals with 1 child exhibit balanced ownership across car categories, with a
  peak in 1 and 2-car households (12 and 12 respectively).
- **Professionals with more than 2 children tend to own more cars:**
  As the number of children increases from 3 to 5, there is a noticeable upward shift in
  3- and 4-car ownership, showing a direct correlation between family size and car
  requirements.

Business Recommendation:

Professionals with no children own the highest number of cars, indicating strong financial
capacity—ideal for premium or luxury car marketing. Families with 2 or more children
typically own 2 to 4 cars, showing a need for multi-vehicle insurance or service packages.
Car ownership increases with family size, so bundle offers and fuel-efficient car promotions
would appeal to large professional families. Segmenting marketing strategies by number of
children can drive more personalized campaigns and higher engagement.
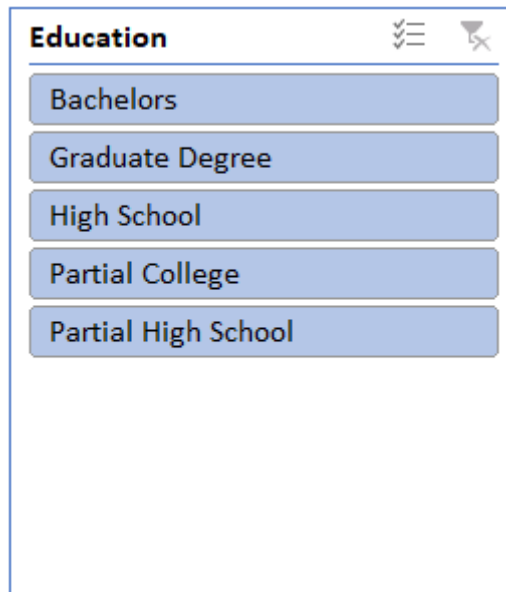
Slicer:

1.Region

- **Variation Across Regions:**
  Car ownership patterns among professionals vary notably across different regions—
  for example, Pacific professionals with no children tend to own more cars than those
  in other regions.
- **Higher Ownership in Developed Regions:**
  Regions like North America and Europe often show higher car ownership among
  professionals, especially for households with 2 or more children.

2.Occupition
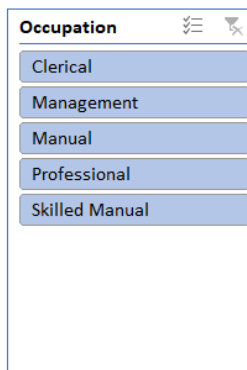
- Professionals and Managers show higher car ownership even with no children,
  indicating greater purchasing power.
- Manual laborers and Clerical workers tend to own fewer cars, showing more need-
  based purchases.
- Car ownership rises with number of children across all occupations, but faster in high-
  income groups.
- Sales and Marketing roles show moderate ownership, possibly due to mobility needs.
- Homemakers generally show lower car ownership, possibly reflecting single-income
  households.
- Occupation is a strong indicator of income, which directly impacts vehicle ownership
  trends.

3.Education

- Individuals with **Bachelor's or Master's degrees** tend to own **more cars**, likely due to higher income levels.
- **PhD holders** show moderate car ownership, possibly valuing quality over quantity.
- Those with **High School education** generally own fewer cars, reflecting budget constraints.
- Car ownership steadily increases with higher education levels.
- Educated consumers may prioritize fuel efficiency, safety features, and long-term value.
- Education level directly influences earning potential and lifestyle, impacting vehicle purchase decisions.

Dashboard Overview – Bike Sales Analysis
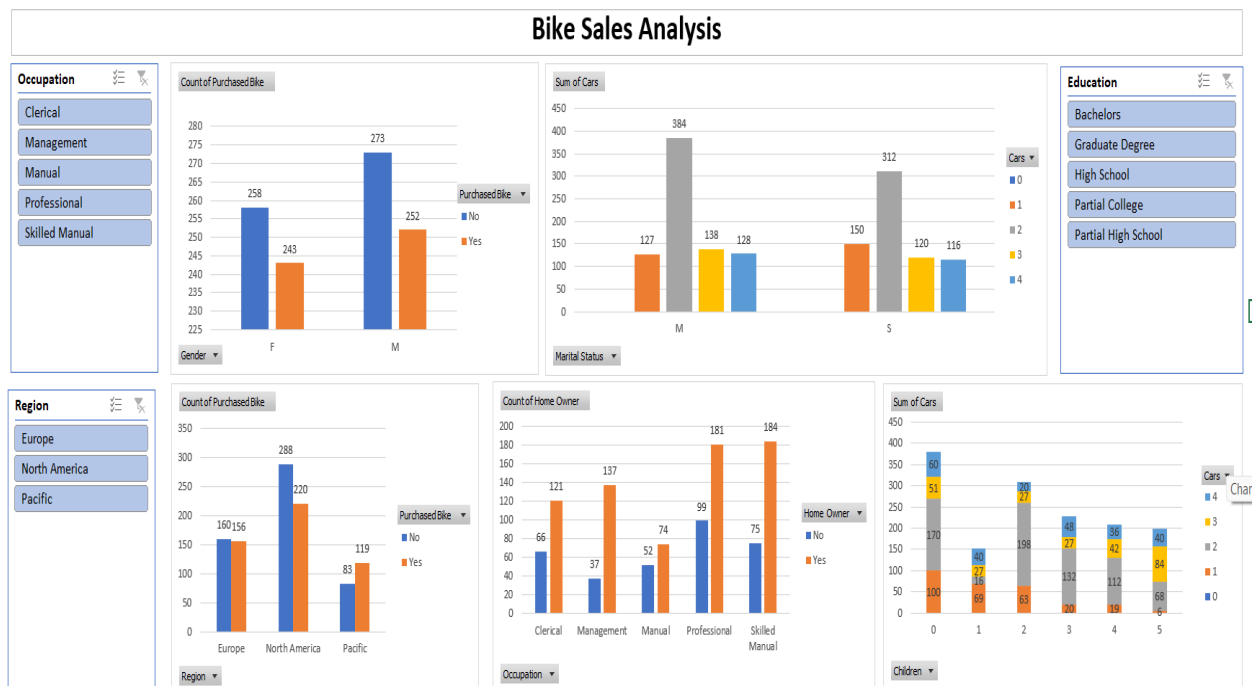
This dashboard provides a multi-dimensional analysis of bike purchasing behavior using slicers for **Education**, **Occupation**, and **Region**. The visuals included offer valuable insights into customer demographics and lifestyle factors that influence bike purchases.

 Key visuals and insights:

- **Bike Purchase by Gender**: Highlights gender-based buying trends.

- **Sum of Cars by Marital Status**: Shows how family structure affects vehicle ownership.

- **Count of Bikes by Region**: Identifies geographic trends in bike sales.

- **Home Ownership by Occupation**: Reveals economic stability and purchase potential by profession.

- **Sum of Cars by Children**: Suggests a correlation between family size and vehicle needs.

Interactive slicers enable users to filter data and observe how these factors shift across education levels, occupations, and regions for deeper business understanding.

Business Recommendations

- **Segmented Marketing by Education & Occupation**: Professionals and highly educated individuals tend to own more bikes and cars — target them with premium models and commuter-friendly features.

- **Gender-Focused Campaigns**: If females or males show higher purchases in certain segments, design separate campaigns (e.g., safety, design appeal) to address their preferences.

- **Regional Promotions**: Tailor offers for high-performing regions (like North America or Pacific), and explore growth strategies in underperforming areas.

- **Family-Oriented Incentives**: Customers with children and more cars suggest larger households — introduce bundle offers or loyalty programs for families.

- **Occupation-Based Sales Strategy**: Occupations like 'Professional' and 'Manager' correlate with home and vehicle ownership — offer financing or EMI options aligned with their income levels.

- **Utilize Slicers for Campaign Targeting**: The slicers can guide personalized campaigns based on education level or region, increasing conversion potential.

CONCLUSION

The Bike Sales Analysis reveals important patterns in customer behavior across demographic and lifestyle variables. Factors such as **occupation, education level, region, marital status, number of children, and gender** all influence the likelihood of purchasing a bike. Key findings indicate that **professionals and educated individuals** are more likely to purchase bikes, especially in regions like **North America and the Pacific**. Additionally, ownership of cars and home property often correlates with higher bike purchases, suggesting economic stability plays a key role.

By using **interactive slicers and visuals**, we uncovered detailed customer segments that businesses can target more effectively. These insights can guide strategic decisions in marketing, inventory planning, and product development to boost sales and customer satisfaction.