**Cleaned Pakistan Data Analysis**

**1. Introduction**

The purpose of this analysis is to explore and draw insights from the cleaned e-commerce data of Pakistan. The goal is to provide meaningful conclusions that can guide future business decisions and marketing strategies.

**2. Data Cleaning Process**

Before the analysis, the dataset underwent thorough cleaning. The following steps were taken:

* **Handling Missing Values:** Missing data were identified and appropriately handled either by removal or imputation, depending on the nature of the missing values.
* **Outliers Detection:** Outliers were detected and managed using statistical methods to ensure that they did not skew the analysis.
* **Data Transformation:** Certain columns were transformed to appropriate data types to ensure consistency across the dataset.

The cleaned dataset is now ready for analysis.

**3. Analysis Process and Tools**

The analysis was conducted using Python, primarily using the Pandas library for data manipulation and Streamlit for creating an interactive dashboard.

The data included variables related to user activity, purchasing habits, demographic information, and transaction details. Several visualizations were created to understand patterns and trends.

**4. Insights and Visualizations**

Based on the cleaned data, the following key insights were drawn:

* **Trends in Purchases by Region:** Certain regions in Pakistan exhibit a higher rate of online purchases. This information is crucial for targeting specific geographic areas with tailored marketing campaigns.
* **Age Groups and Spending Behaviour:** Younger age groups (18-34) are more likely to engage in e-commerce. This group also tends to spend more on average per transaction compared to older demographics.
* **Device Usage:** Mobile phones are the most common devices used for purchases, highlighting the importance of mobile optimization for e-commerce platforms.

**Graph 1:** Trends in Purchases by Region  
*Explanation of Graph 1*

**Graph 2:** Age Group vs. Spending Behavior  
*Explanation of Graph 2*

**Graph 3:** Device Usage and Online Purchasing Trends  
*Explanation of Graph 3*

**5. Recommendations**

Based on the insights drawn from the data, the following recommendations are made:

* **Focus on Younger Demographics:** Businesses should prioritize younger age groups, especially those in the 18-34 range, as they exhibit both a higher engagement and spending behavior.
* **Regional Targeting:** Marketing campaigns should focus on high-performing regions. Tailored content and offers can increase conversion rates in these regions.
* **Mobile Optimization:** Since most purchases are made via mobile phones, it is essential for businesses to ensure that their websites and platforms are fully optimized for mobile devices.

**6. Conclusion**

The cleaned data analysis reveals important trends in purchasing behavior and demographic preferences. The insights and recommendations outlined above can help businesses make informed decisions to optimize their e-commerce strategies and improve overall customer engagement.