**========================================================Project Brief: Marketing Campaign Performance Analysis**

**Project Overview**

Our company has been running multiple marketing campaigns across various channels (Facebook, Instagram, Pinterest) to promote our products. We have collected detailed data on daily ad performance, including metrics like impressions, clicks, spend, conversions, and engagement (likes, shares, comments). This project aims to analyze this data to gain insights into the effectiveness of our campaigns, optimize our ad spend, and improve future marketing strategies.

**Objectives**

* **Evaluate Campaign Performance:** Assess the overall performance of each campaign in terms of reach, engagement, and conversions.
* **Channel Effectiveness:** Determine which advertising channels are driving the best results.
* **Geographical Insights:** Identify the cities that show the highest engagement and conversion rates.
* **Device Performance:** Understand how ads perform across different devices.
* **Ad-Level Analysis:** Analyze the performance of individual ads to identify high-performing creatives.
* **ROI Calculation:** Calculate the return on investment (ROI) for each campaign.
* **Time Series Analysis:** Track the performance trends over time to identify patterns and seasonal effects.

**Data Description**

The dataset contains the following columns:

* **Campaign:** Name of the marketing campaign.
* **Date:** Date for daily ad performance metrics.
* **City/Location:** Cities that were targeted by the campaign.
* **Latitude:** Latitude for the cities.
* **Longitude:** Longitude for the cities.
* **Channel:** Channel where ads were displayed (Facebook, Instagram, Pinterest).
* **Device:** Device from which ads were viewed.
* **Ad:** Ads used within a campaign.
* **Impressions:** Daily impressions (times ad was shown to a viewer) for each ad.
* **CTR, %:** Daily average click-through rate for each ad.
* **Clicks:** Daily clicks for each ad.
* **Daily Average CPC:** Daily average cost-per-click for each ad.
* **Spend, GBP:** Total daily amount of advertising spending for each ad, in GBP.
* **Conversions:** Total daily purchases attributed to a specific ad.
* **Total conversion value, GBP:** Total amount in GBP received from purchases attributed to a specific ad.
* **Likes:** Total daily likes (or other reactions) per ad.
* **Shares:** Total daily shares per ad. For simplicity, each Pin on Pinterest is counted as a share.
* **Comments:** Total daily comments per ad.

**Key Questions to Answer**

1. **Campaign Performance:**
   * Which campaign generated the highest number of impressions, clicks, and conversions?
   * What is the average cost-per-click (CPC) and click-through rate (CTR) for each campaign?
2. **Channel Effectiveness:**
   * Which channel has the highest ROI?
   * How do impressions, clicks, and conversions vary across different channels?
3. **Geographical Insights:**
   * Which cities have the highest engagement rates (likes, shares, comments)?
   * What is the conversion rate by city?
4. **Device Performance:**
   * How do ad performances compare across different devices (mobile, desktop, tablet)?
   * Which device type generates the highest conversion rates?
5. **Ad-Level Analysis:**
   * Which specific ads are performing best in terms of engagement and conversions?
   * What are the common characteristics of high-performing ads?
6. **ROI Calculation:**
   * What is the ROI for each campaign, and how does it compare across different channels and devices?
   * How does spend correlate with conversion value across different campaigns?

**Methodology**

1. **Data Cleaning:** Ensure the data is clean, with no missing or inconsistent entries.
2. **Descriptive Statistics:** Compute basic statistics for each metric to get an overview of the data.
3. **Aggregation and Grouping:** Use SQL queries to aggregate data by different dimensions (campaign, channel, city, device).
4. **Visualization:** Create visualizations to identify trends and patterns.
5. **ROI and Conversion Analysis:** Calculate ROI and analyze conversion metrics to assess campaign effectiveness.
6. **Reporting:** Compile findings into a comprehensive report with actionable insights and recommendations.

**Deliverables**

1. **Detailed Report:** A document summarizing the key findings, insights, and recommendations based on the data analysis.
2. **SQL Queries:** A collection of SQL queries used for data extraction and analysis.
3. **Dashboards/Visualizations:** Interactive dashboards or charts that visualize the performance metrics across different dimensions.
4. **Presentation:** A PowerPoint presentation highlighting the main insights and suggestions for optimizing future campaigns.

**SQL Queries for Analysis**