Marketing Campaign Performance Analysis – Case Study

🎯 Objective of the Project

To evaluate and optimize the performance of an e-commerce company's marketing campaigns across **Facebook** and **Google AdWords**, with the goal of **maximizing conversions** and **minimizing customer acquisition costs**.

📂 Dataset Overview

- **Source**: Marketing campaign dataset
- **Time Period**: 1 year (daily data)
- **Key Fields**: Views, Clicks, Conversions, Spend for both Facebook and AdWords
- **Derived Metrics**: CTR, CPC, Conversion Rate, Cost per Conversion

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❓ Key Business Questions

As outlined in the business requirements document:

1. Which platform performs better in terms of **CTR** and **conversion rate**?
2. What are the **monthly trends** in CPC, CTR, and conversions?
3. Are there **seasonal patterns** or **performance improvements** over time?
4. Which campaigns or days show **high spend but low results**?
5. What is the **correlation** between cost, clicks, and conversions?

🛠️ Tools Used

- **Python**: For data cleaning, transformation, exploratory data analysis (EDA), insights, and correlation analysis
- **Power BI**: For creating interactive dashboards to visualize trends, compare platforms, and answer business questions

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🔍 Key Insights (from Python EDA)

1. Conversion Trends

- Daily conversions improved over the year, rising from ~10 to 25/day.
- Monthly average conversions increased from **16.5 (Jan)** to **18.9 (Dec)**.

2. Cost Efficiency

- **Cost per Conversion** dropped from **$14.40 in January** to **$12.09 in December** (↓16%).

3. Platform Comparison

- **CTR**: Facebook outperformed AdWords on **303 days**.
- **Conversion Rate**: Facebook outperformed AdWords on **365 days** (every day in dataset).

4. Cost per Conversion Stability

- High volatility in early months reduced over time, showing **better cost control**.

5. CTR & Conversion Rate

- **Facebook CTR**: 1.5–5.0% (peaks >3%)
- **AdWords CTR**: 0.8–1.8%
- **Facebook Conv. Rate**: 22–40% (peaks >45%)
- **AdWords Conv. Rate**: 8–18%

6. Correlation Analysis

- **Clicks ↔ Conversions**: 0.76 (strong positive)
- **CPC ↔ Conv. Rate**: –0.54 (FB), –0.64 (AdWords) → lower CPC improves efficiency
- **Cost ↔ Views**: 0.63 → spend increases reach, not necessarily conversions

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📊 Dashboard Visuals in Power BI

Executive Summary Page:

- Total Spend by Platform (Pie Chart)

- Total Conversions by Platform
- Avg. CPC and Avg. Conversion Rate (Card visuals)

Monthly Trend Analysis:

- Line charts for:
    - Monthly Conversions
    - CTR trends
    - Cost per Conversion trends
- Platform comparison (FB vs AdWords)

Cost Efficiency Page:

- Funnel Charts (Views → Clicks → Conversions)
- Cost per Click Trends
- Spend vs Conversions (Scatter Plots)

Correlation Insights Page:

- Scatter plots:
    - Clicks vs Conversions
    - Cost vs Conversions
    - CPC vs Conv. Rate
- Heatmap of correlations

✅ **Final Recommendations**

- 📌 **Shift more budget to Facebook**, which consistently outperforms AdWords in CTR and conversion rate.
- 📌 **Focus on increasing qualified clicks**, as clicks have the strongest impact on conversions.
- 📌 **Lower CPC is essential** for better conversion efficiency—optimize ad creatives and targeting.

- 📌 **Monitor early campaign CPC volatility** and replicate the more stable patterns seen in later months.
- 📌 **Explore seasonal spikes**, especially October–December, to identify high-performing tactics.