SQL Basics and Marketing: Campaign Data Report.

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1. Introduction

In today's competitive digital landscape, data-driven decision-making is crucial for optimizing marketing efforts. This report aims to analyze marketing campaign performance using SQL queries to extract actionable insights. By leveraging structured data, I assesed key performance indicators such as impressions, click-through rates (CTR), return on investment (ROI), and cost per conversion.

2. Objective

The goal of this analysis is to extract actionable insights by retrieving, filtering, and summarizing key data points from the marketing campaign dataset and providing possible solutions to make campaigns scalable and profitable over time.

3. Dataset Overview

The dataset (Market Campaign Dataset) used for this analysis as provided by HNG contains information on multiple marketing campaigns, including metrics such as impressions, clicks, engagement_scores, acquisition_costs, conversion_rate, and ROI. I queried the data using PostgreSQL to evaluate campaign effectiveness, and provide strategic recommendations for marketing optimization.

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4. SQL Queries and Insights

a) Total Impressions for Each Campaign

Query: Extracted total impressions grouped by campaign ID. This is a sum of impressions from the dataset grouped by campaign_id.

```
SELECT campaign_id, SUM(impressions) AS total_impressions
FROM marketing_campaign
GROUP BY campaign_id;
```

Data Output | Messages | Graph Visualiser | Notifications

	campaign_id [PK] integer	total_impressions bigint
1	1	1922
2	2	7523
3	3	7698
4	4	1820
5	5	4201
6	6	1643
7	7	8749

b) Campaign with the Highest ROI

Query: Identified the campaign with the highest return on investment (ROI).

Findings:

- The company nextgen systems had the highest ROI through the Campaign Display provided on website channel. It had ROI at **8%**, making it the most effective campaign.

```
SELECT campaign_id, company, roi
FROM marketing_campaign
ORDER BY roi DESC
LIMIT 1;
```

Data Output | Messages | Graph Visualiser | Notifications

	campaign_id [PK] integer	company text	roi double precision
1	168	NexGen Systems	8

c) Top 3 Locations with Most Impressions

Query: Retrieved the top 3 locations with the highest impressions.

Findings:

- **Newyork, Miami and Chicago** were the top locations with the highest impressions, suggesting strong regional engagement.

```
31
32  SELECT location, SUM(impressions) AS total_impressions
33  FROM marketing_campaign
34  GROUP BY location
35  ORDER BY total_impressions DESC
36  LIMIT 3;
```

Data Output | Messages | Graph Visualiser | Notifications

	location text	total_impressions bigint
1	New York	221359756
2	Miami	221347726
3	Chicago	219999352

d) Average Engagement Score by Target Audience

Query: Calculated the average engagement score per target audience.

Findings:

- Audience Group Men within the ages 18-24 had the highest engagement score.
- Audience Group Men in the age range of 25-34 showed low engagement, requiring targeted improvements.

```
38  SELECT target_audience, AVG(engagement_score) AS avg_engagement_score
39  FROM marketing_campaign
40  GROUP BY target_audience;
41
```

Data Output | Messages | Graph Visualiser | Notifications

	target_audience text	avg_engagement_score numeric
1	All Ages	5.4868693935683766
2	Men 18-24	5.5150152760873345
3	Men 25-34	5.4919798121127324
4	Women 25-34	5.4927398595456477
5	Women 35-44	5.4865702479338843

e) Overall Click-Through Rate (CTR)

Query: Computed the overall CTR across all campaigns.

Findings:

- The overall CTR is **9.9826390%**, indicating effective ad performance compared to industry benchmarks.

```
41
42  SELECT (SUM(clicks)::FLOAT / SUM(impressions)) * 100 AS overall_ctr
43  FROM marketing_campaign;
44
```

Data Output | Messages | Graph Visualiser | Notifications

	overall_ctr double precision
1	9.982639063368623

f) Most Cost-Effective Campaign

Query: Identified the campaign with the lowest cost per conversion.

Findings:

- Campaign_id 101103 which is for the company Alpha Innovations had the lowest cost per conversion at **$33346.666**, making it the most cost-efficient. The campaign_type used is Search.

```
57  SELECT campaign_id,
58         company,
59         (CAST(REPLACE(REPLACE(acquisition_cost, '$', ''), ',', '')
60         AS NUMERIC) / conversion_rate) AS cost_per_conversion
61  FROM marketing_campaign
62  WHERE conversion_rate > 0
63  ORDER BY cost_per_conversion ASC
```

Data Output | Messages | Graph Visualiser | Notifications

	campaign_id [PK] integer	company text	cost_per_conversion double precision
1	101103	Alpha Innovations	33346.66666666667

g) Campaigns with CTR Above Threshold

Query: Filtered campaigns where CTR exceeded a given threshold of 5%.

Findings:

- **160,332** campaigns performed above the CTR threshold, indicating strong audience engagement.

```sql
SELECT campaign_id, company, (clicks * 100.0 / impressions) AS ctr
FROM marketing_campaign
WHERE (clicks * 100.0 / impressions) > 5;
```

Data Output | Messages | Graph Visualiser | Notifications

	campaign_id [PK] integer	company text	ctr numeric
1	1	Innovate Industries	26.3267429760665973
2	3	Alpha Innovations	7.5863860743050143
3	4	DataTech Solutio...	11.9230769230769231
4	5	NexGen Systems	9.0216615091644846
5	6	DataTech Solutio...	6.0864272671941570
6	7	NexGen Systems	9.3382100811521317

h) Ranking Channels by Total Conversions

Query: Ranked marketing channels based on total conversions.

Findings:

- **Email channel** led with the highest conversions.
- **Facebook channel** showed lower performance, requiring strategic adjustments.

```sql
SELECT channel_used, SUM(conversion_rate) AS total_conversions
FROM marketing_campaign
GROUP BY channel_used
ORDER BY total_conversions DESC;
```

Data Output | Messages | Graph Visualiser | Notifications

	channel_used text	total_conversions double precision
1	Email	2697.37999999989
2	Google Ads	2681.239999999876
3	Website	2674.9499999998775
4	YouTube	2667.759999999887
5	Instagram	2667.5699999998546
6	Facebook	2625.2699999998586

5. Conclusion & Recommendations

- Optimize ad creatives for campaigns with low CTR.
- Increase budget allocation for high-performing locations and audience groups to keep performance.
- Reduce spending on underperforming campaigns and channels.
- Conduct testing to refine campaign strategies in low performing campaigns.