ALLO HEALTH ASSIGNMENT

Descriptive Analysis

Dissertation submitted in fulfilment of the requirements for the Degree of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

By

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DECLARATION STATEMENT

I hereby declare that the research work reported in the dissertation/dissertation proposal entitled "**ALLO HEALTH ASSIGNMENT"** in partial fulfilment of the requirement for the award of Degree for Master of Technology in Computer Science and Engineering at Lovely Professional University, Phagwara, Punjab. I have not submitted this work elsewhere for any degree or diploma.

I understand that the work presented herewith is in direct compliance with Lovely Professional University's Policy on plagiarism, intellectual property rights, and highest standards of moral and ethical conduct. Therefore, to the best of my knowledge, the content of this dissertation represents authentic and honest research effort conducted, in its entirety, by me. I am fully responsible for the contents of my dissertation work.

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INTRODUCTION:

In the realm of data exploration, descriptive analysis plays a pivotal role, offering a comprehensive summary and description of a dataset's primary properties. This phase is crucial for understanding the fundamental aspects of data, including frequency distribution, central tendency, dispersion, and positional metrics. By leveraging these insights, businesses can make informed decisions and develop strategic plans. This project focuses on the descriptive analysis of advertising data from two major platforms—Google and Facebook. By examining metrics such as impressions and clicks, grouped by campaign name, ad set name, and date, we aim to provide a clear visualization of advertising performance over time and across different campaign structures.

METHODOLOGY:

Descriptive analysis:

It is a chief phase in data exploration which gives us the summarized and described primary properties of a dataset. It shows the insights into the data frequency distribution, central tendency, scattering and position identification.

1. **Summarise key metrics for each channel:**

Key Matrix:

Metrics serve as quantitative analysis metrics to track and evaluate the performance of specific business areas, playing a big role in the planning process by permit the creation of efficient sales plans.

Summary key matrix of data grouped by campaign name, ad set name and date:

```python
summary = merged_data.groupby(['Campaign Name', 'Ad Set Name','Date']).agg({
    'Impressions_google': 'sum',
    'Clicks (Traffic)_google': 'sum',
    'CTR_google': 'mean',
    'Cost (INR)_google': 'sum',
    'Leads_google': 'sum',
    'CPL (INR)_google': 'mean',
    'Impressions_facebook': 'sum',
    'Clicks (Traffic)_facebook': 'sum',
    'CTR_facebook': 'mean',
    'Cost (INR)_facebook': 'sum',
    'Leads_facebook': 'sum',
    'CPL (INR)_facebook': 'mean'
}).reset_index()
```

- Graph I: Using summary matrix plot a line graph of date column and impression column.
- Output:

Daily Impressions Over Time
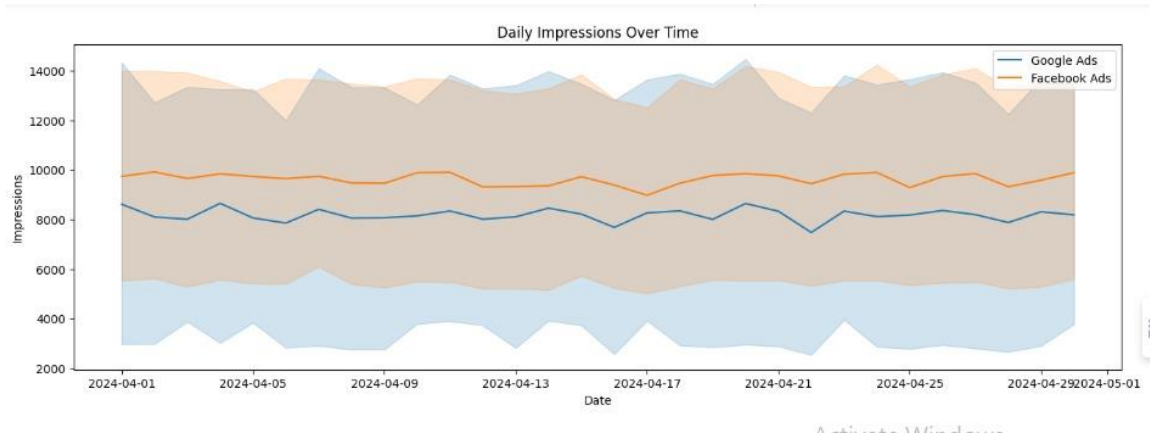
```
plt.figure(figsize=(16, 5))
plt.title('Daily Impressions Over Time')
sns.lineplot(data=summary, x='Date', y='Impressions_google', label='Google Ads')
sns.lineplot(data=summary, x='Date', y='Impressions_facebook', label='Facebook Ads')
plt.xlabel('Date')
plt.ylabel('Impressions')
plt.legend()
plt.show()
```

This graph shows how impressions change by date in both datasets.

- Graph II: Using summary matrix plot a line graph of date column and clicks.

```
plt.figure(figsize=(14, 5))
plt.title('Daily Clicks Over Time')
sns.lineplot(data=summary, x='Date', y='Clicks (Traffic)_google', label='Google Ads')
sns.lineplot(data=summary, x='Date', y='Clicks (Traffic)_facebook', label='Facebook Ads')
plt.xlabel('Date')
plt.ylabel('Clicks')
plt.legend()
plt.show()
```

- Output:

This graph shows how clicks happened by date in both datasets.

Summary key matrix of data grouped by campaign name and ad set name:

```python
summary = merged_data.groupby(['Campaign Name', 'Ad Set Name']).agg({
    'Impressions_google': 'sum',
    'Clicks (Traffic)_google': 'sum',
    'CTR_google': 'mean',
    'Cost (INR)_google': 'sum',
    'Leads_google': 'sum',
    'Traffic to Lead_google': 'mean',
    'Lead to Call_google': 'mean',
    'Call_google': 'sum',
    'Impressions_facebook': 'sum',
    'Clicks (Traffic)_facebook': 'sum',
    'CTR_facebook': 'mean',
    'Cost (INR)_facebook': 'sum',
    'Leads_facebook': 'sum',
    'Traffic to Lead_facebook': 'mean',
    'Lead to Call_facebook': 'mean',
    'Call_facebook': 'sum'
}).reset_index()
```


Daily Clicks Over Time
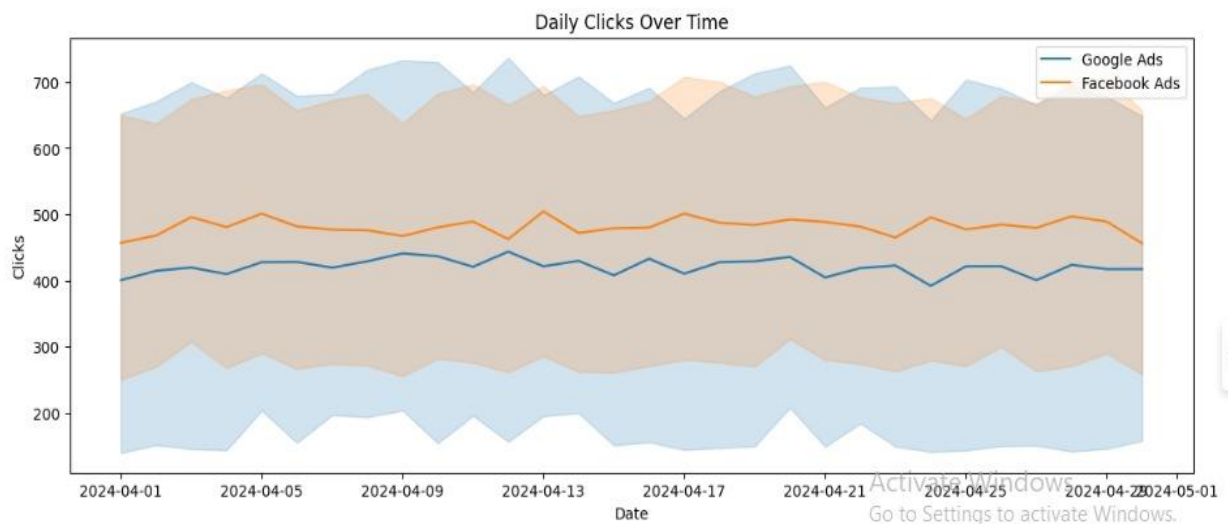
- Graph I: The bar plot for comparing the impressions in google data over campaign

```
plt.figure(figsize=(14, 7))
plt.title('Total Impressions by Campaign and Ad Set')
sns.barplot(data=summary, x='Campaign Name', y='Impressions_google', hue='Ad Set Name')
plt.xlabel('Campaign Name')
plt.ylabel('Total Impressions')
plt.legend(title='Ad Set Name', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.show()
```

- Output:
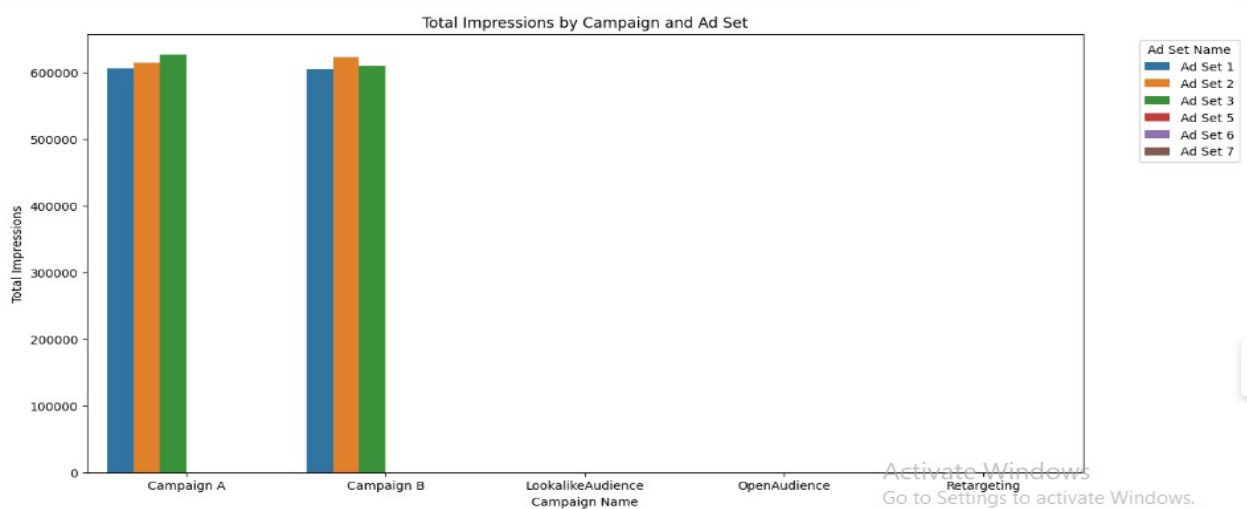
2. Visualise the data using appropriate charts:

- Graph II: The bar plot for comparing the impressions in facebook data over campaign and Ad Set:

```python
plt.figure(figsize=(14, 7))
plt.title('Total Impressions by Campaign and Ad Set')
sns.barplot(data=summary, x='Campaign Name', y='Impressions_facebook', hue='Ad Set Name')
plt.xlabel('Campaign Name')
plt.ylabel('Total Impressions')
plt.legend(title='Ad Set Name', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.show()
```
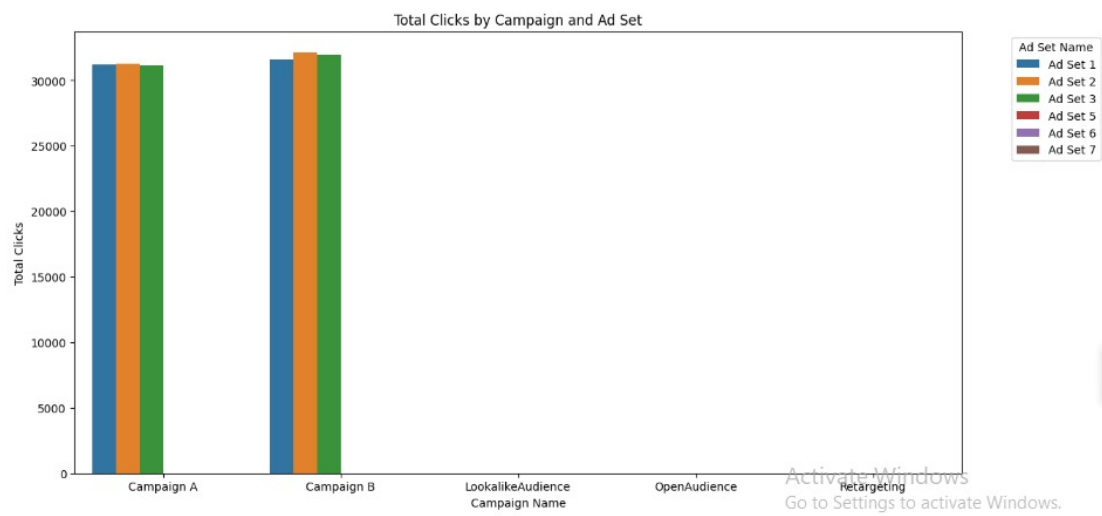
- Output:
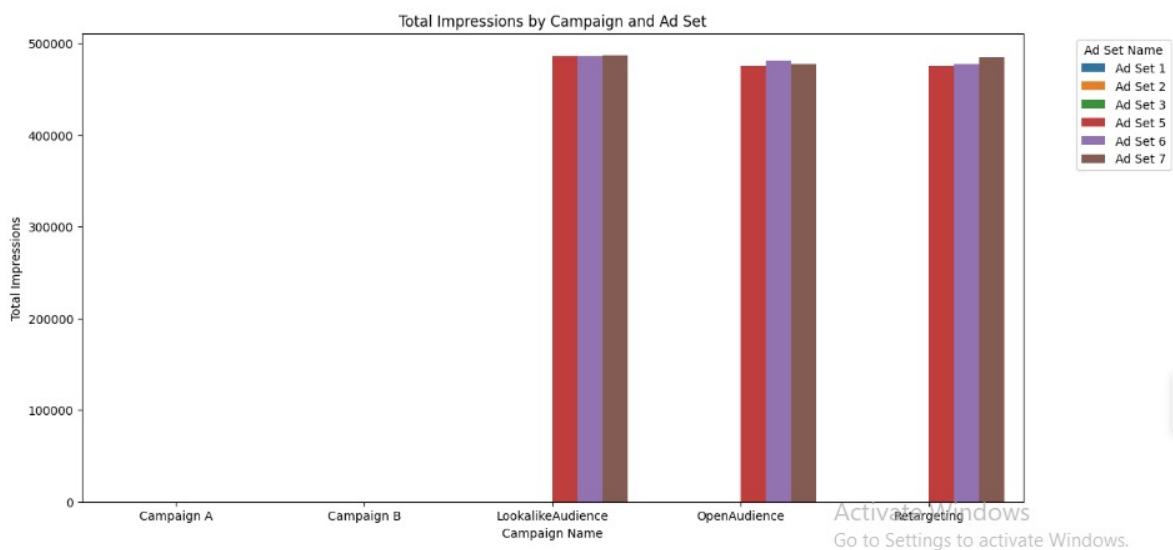
- Graph III: The bar plot to compare total number of clicks in google data with the campaign name and Ad set.

```python
plt.figure(figsize=(14, 7))
plt.title('Total Clicks by Campaign and Ad Set')
sns.barplot(data=summary, x='Campaign Name', y='Clicks (Traffic)_google', hue='Ad Set Name')
plt.xlabel('Campaign Name')
plt.ylabel('Total Clicks')
plt.legend(title='Ad Set Name', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.show()
```

- Output:

- Graph IV: The bar plot to compare total number of clicks in facebook data with the campaign name and Ad set

```python
plt.figure(figsize=(14, 7))
plt.title('Total Clicks by Campaign and Ad Set')
sns.barplot(data=summary, x='Campaign Name', y='Clicks (Traffic)_facebook', hue='Ad Set Name')
plt.xlabel('Campaign Name')
plt.ylabel('Total Clicks')
plt.legend(title='Ad Set Name', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.show()
```

- Output:
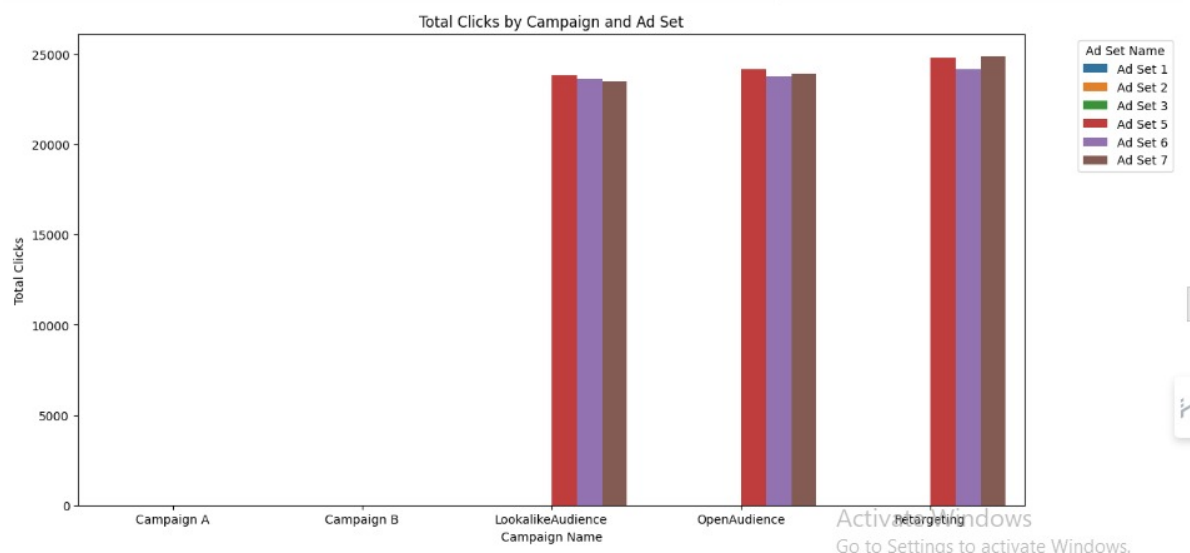
CONCLUSION:

The descriptive analysis conducted in this project provides valuable insights into the performance of advertising campaigns on Google and Facebook. Through detailed visualizations, including line graphs and bar plots, we have illustrated how impressions and clicks fluctuate over time and vary across different campaigns and ad sets. These findings enable a deeper understanding of the effectiveness of different advertising strategies, assisting in the optimization of future marketing efforts. By tracking and evaluating these key metrics, businesses can refine their sales plans, enhance campaign efficiency, and ultimately achieve better advertising outcomes.