

**ALLO HEALTH ASSIGNMENT**  
**BENCHMARK COMPARISION**

*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

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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.

*Signature of Candidate*

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## INTRODUCTION:

In digital marketing, benchmarking is a crucial process that enables businesses to compare their performance metrics against industry standards or predefined targets. This project focuses on a detailed benchmark comparison of key performance indicators (KPIs) for advertising campaigns on Google and Facebook. By converting aggregate benchmark values to percentages and integrating them into the summary data, we can assess whether specific metrics such as click-through rate (CTR), lead to call ratio, and traffic to lead ratio meet, exceed, or fall short of these benchmarks. Using a function designed to compare these metrics against benchmarks, we will identify areas of success and areas requiring improvement. This analysis aims to guide strategic decisions to optimize advertising performance and maximize revenue generation.

## METHODOLOGY:

### 1. Compare the performance of your campaigns and ad sets against the provided industry benchmarks:

#### Benchmarks:

I have taken average benchmarks from the given document.

```
benchmarks = {  
    'CTR_google': 9,  
    'CTR_facebook': 2.5,  
    'Traffic to Lead_google': 7.5,  
    'Traffic to Lead_facebook': 13.5,  
    'Lead to Call_google': 27.5,  
    'Lead to Call_facebook': 13.5  
}
```

I converted the aggregate values of benchmarks column to percentage.

- Google aggregate values to percentage:

```
summary['CTR_google']=summary['CTR_google']*100  
summary['Lead to Call_google']=summary['Lead to Call_google']*100  
summary['Traffic to Lead_google']=summary['Traffic to Lead_google']*100
```

- Facebook aggregate values to percentage:

```
summary['CTR_facebook']=summary['CTR_facebook']*100
summary['Lead to Call_facebook']=summary['Lead to Call_facebook']*100
summary['Traffic to Lead_facebook']=summary['Traffic to Lead_facebook']*100
```

Add this benchmark column to summary data:

I created a function called plot comparison in that it has attributes called metric and channel. For comparing the benchmarks of the columns.

```
def plot_comparison(metric, channel):
    plt.figure(figsize=(14, 7))
    plt.title(f'{metric} Comparison for {channel.capitalize()} Ads')
    sns.barplot(data=summary, x='Campaign Name', y=f'{metric}_{channel}', hue='Ad Set Name')
    plt.axhline(y=benchmarks[f'{metric}_{channel}'], color='r', linestyle='--', label='Benchmark')
    plt.xlabel('Campaign Name')
    plt.ylabel(metric.replace('_', ' ').title())
    plt.legend(title='Ad Set Name', bbox_to_anchor=(1.05, 1), loc='upper left')
    plt.show()
```

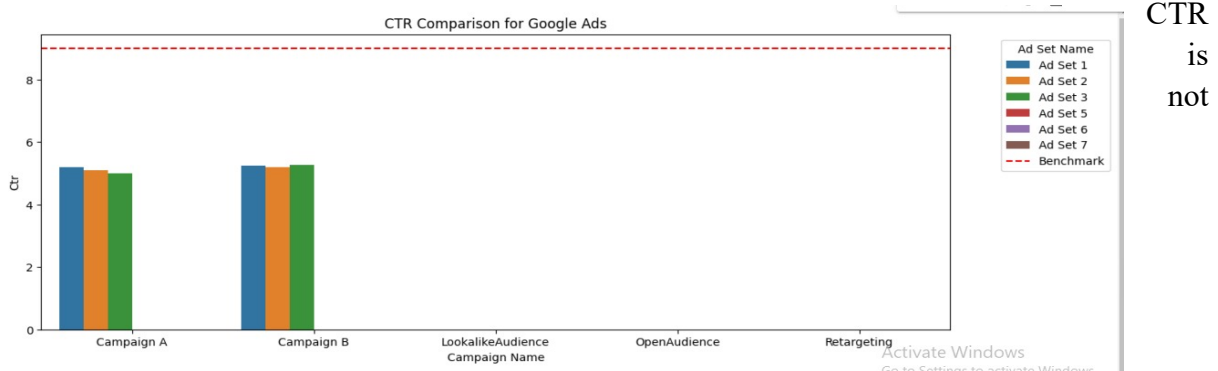
```
summary['CTR_google_benchmark'] = benchmarks['CTR_google']
summary['CTR_facebook_benchmark'] = benchmarks['CTR_facebook']
summary['Traffic to Lead_google_benchmark'] = benchmarks['Traffic to Lead_google']
summary['Traffic to Lead_facebook_benchmark'] = benchmarks['Traffic to Lead_facebook']
summary['Lead to Call_google_benchmark'] = benchmarks['Lead to Call_google']
summary['Lead to Call_facebook_benchmark'] = benchmarks['Lead to Call_facebook']
```

Threshold Comparison of Google Columns:

- Graph I: Comparison CTR\_google and CTR\_google\_benchmark

```
plot_comparison('CTR', 'google')
```

- Output

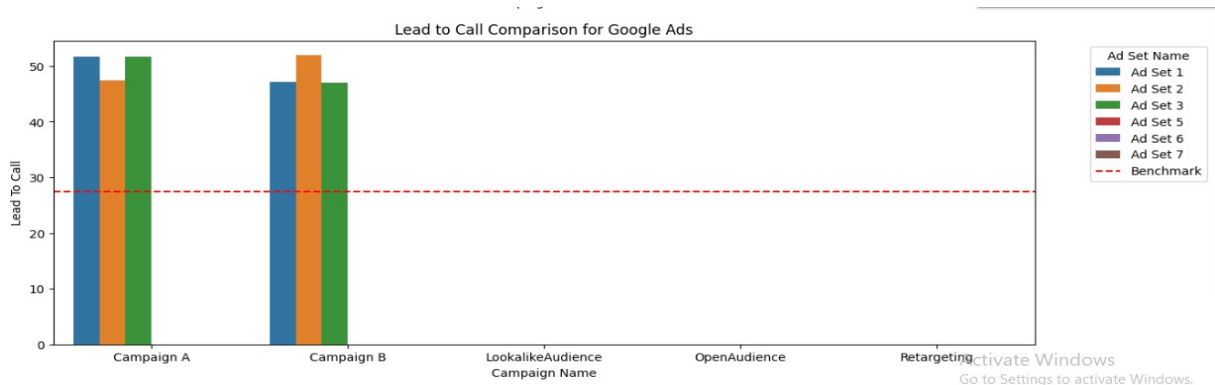


meeting the threshold condition. So, the work has to be done on CTR to pass the threshold value where it reaches up to benchmark.

- Graph II: Comparison between Lead to Call\_google to Lead to Call\_google\_benchmark:

```
plot_comparison('Lead to Call', 'google')
```

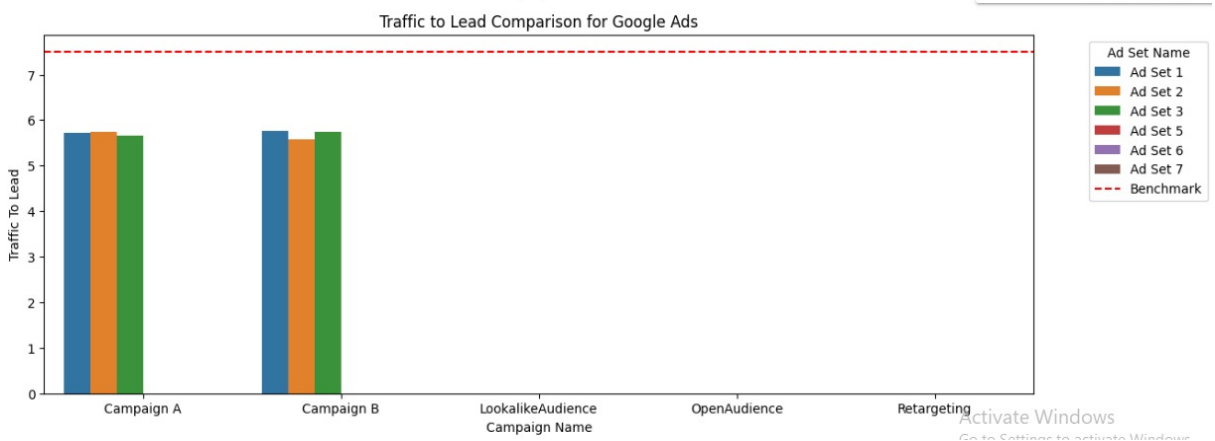
- Output:



Lead to Call is exceeding the threshold condition. Offline clinics were limited the maximum no of offline consultancies is 100 So, the work must be done on Lead to Call to decrease because of the limit of employees.

- Graph III: Comparison between Traffic to Lead \_google to Traffic to Lead\_ google\_benchmark:

```
plot_comparison('Traffic to Lead', 'google')
```



- Output:

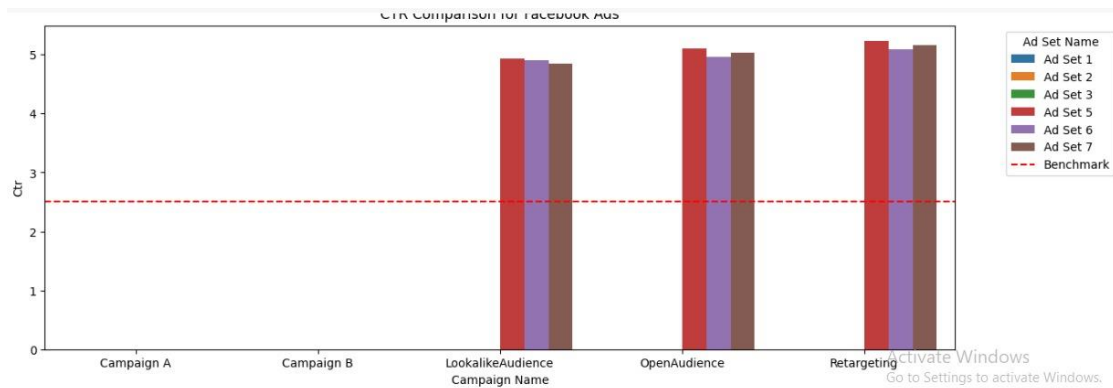
Traffic to Lead is not meeting the threshold condition. So, the work must be done on Traffic to lead to pass the threshold value where it reaches up to benchmark.

Threshold Comparison of Facebook Columns:

- Graph I: Comparison CTR\_facebook and CTR\_facebook\_benchmark

```
plot_comparison('CTR', 'facebook')
```

- Output



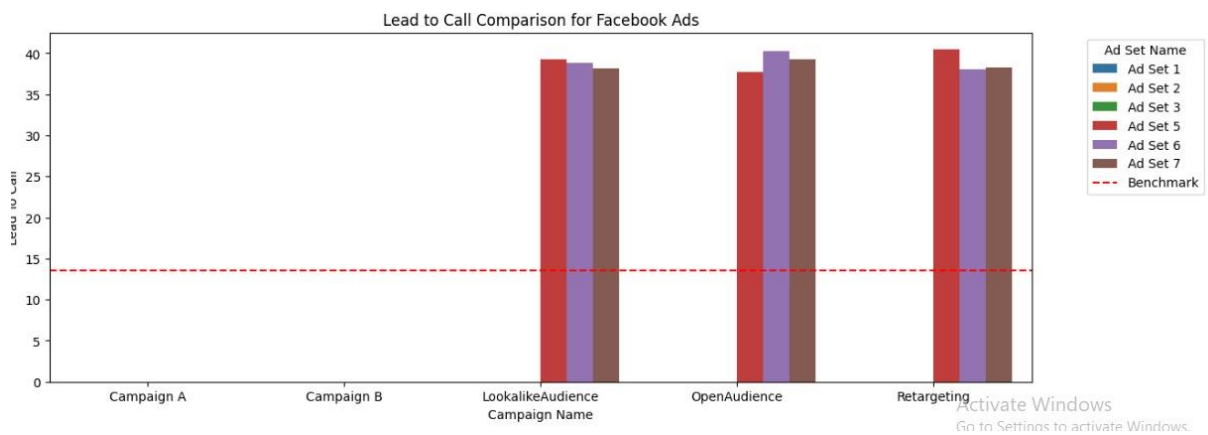
CTR is exceeding the threshold condition.

- Graph II: Comparison between Lead to Call\_facebook to Lead to Call

```
plot_comparison('Lead to Call', 'facebook')
```

\_facebook\_benchmark:

- Output:

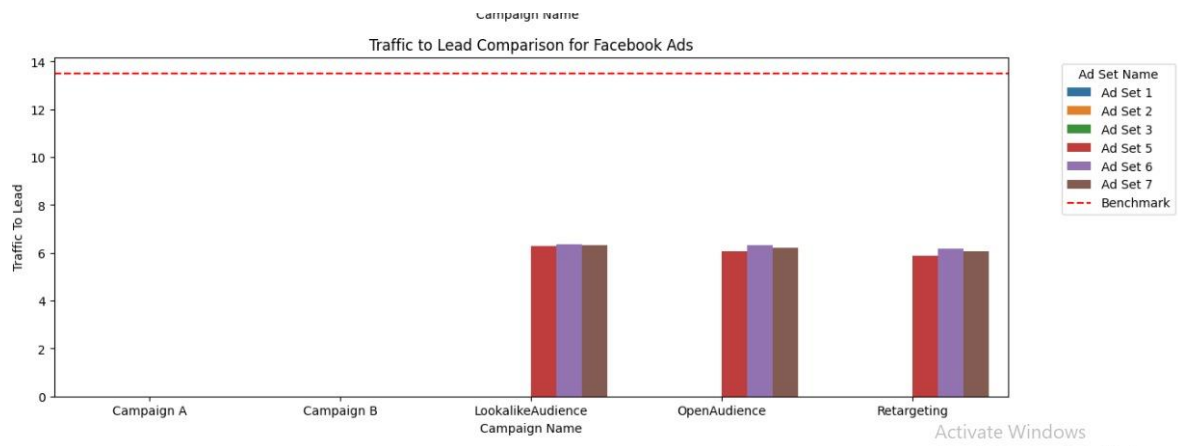


Lead to Call is exceeding the threshold condition. Offline clinics were limited the maximum no of offline consultancies is 100 So, the work must be done on Lead to Call to decrease because of the limit of employees.

- Graph III: Comparison between Traffic to Lead\_facebook to Traffic to Lead\_facebook\_benchmark:

```
plot_comparison('Traffic to Lead', 'facebook')
```

- Output:



Traffic to Lead is not meeting the threshold condition. So, the work must be done on Traffic to lead to pass the threshold value where it reaches up to benchmark.

## 2. Identify areas where performance meets or exceeds benchmarks, and areas where it falls short:

### Revenue generated after calling:

Offline Consultancies are having a limit upto 100.

Revenue per call:

```
REVENUE_PER_CALL_OFFLINE = 2000
REVENUE_PER_CALL_ONLINE = 1200
MAX_OFFLINE_CONSULTATIONS = 100
```

We want to add an online and offline revenues of google data.

```
summary['Revenue_Offline_google'] = summary['Call_google'].apply(lambda x: min(x, MAX_OFFLINE_CONSULTATIONS)) * REVENUE_PER_CALL_OFFLINE
summary['Revenue_Online_google'] = summary['Call_google'] * REVENUE_PER_CALL_ONLINE
summary['Total_Revenue_google'] = summary['Revenue_Offline_google'] + summary['Revenue_Online_google']
```

We want to add an online and offline revenues of facebook data.

```
summary['Revenue_Offline_facebook'] = summary['Call_facebook'].apply(lambda x: min(x, MAX_OFFLINE_CONSULTATIONS)) * REVENUE_PER_CALL_OFFLINE
summary['Revenue_Online_facebook'] = summary['Call_facebook'] * REVENUE_PER_CALL_ONLINE
summary['Total_Revenue_facebook'] = summary['Revenue_Offline_facebook'] + summary['Revenue_Online_facebook']
```

Areas where performance meets or exceeds benchmarks, and areas where it falls short:

Create a function called evaluate performance having attributes called Row, Metric and Channel:



```
def evaluate_performance(row, metric, channel):
    actual = row.get(f'{metric}_{channel}', None)
    benchmark = benchmarks.get(f'{metric}_{channel}', None)
    return 'Meets/Exceeds' if pd.notna(actual) and actual >= benchmark else 'Falls Short'
```

Evaluation performance of google:

```
for metric in ['CTR', 'Traffic to Lead', 'Lead to Call']:
    col_name = f'{metric}_google_evaluation'
    summary[col_name] = summary.apply(lambda row: evaluate_performance(row, metric, 'google'), axis=1)
```

Output:

```
google_performance = summary[['Campaign Name', 'Ad Set Name'] + [col for col in summary.columns if 'google' in col]]
```

```
google_performance = google_performance.dropna(subset=[col for col in google_performance.columns if 'google' in col])
```

Google Performance Evaluation:

	Campaign Name	Ad Set Name	Impressions_google	Clicks (Traffic)_google \
0	Campaign A	Ad Set 1	604974.0	31208.0
1	Campaign A	Ad Set 2	613957.0	31262.0
2	Campaign A	Ad Set 3	625744.0	31184.0
3	Campaign B	Ad Set 1	604458.0	31585.0
4	Campaign B	Ad Set 2	622244.0	32130.0
5	Campaign B	Ad Set 3	609288.0	31947.0

	CTR_google	Cost (INR)_google	Leads_google	Traffic to Lead_google \
0	5.186876	64659.48	1770.0	5.714822
1	5.106211	63755.39	1785.0	5.745683
2	5.006822	63291.58	1756.0	5.665955
3	5.249343	64314.65	1799.0	5.754470
4	5.192834	65108.43	1776.0	5.571164
5	5.267048	63326.82	1821.0	5.741182

	Lead to Call_google	Call_google	CTR_google_benchmark \
0	51.658057	909.0	9
1	47.438991	844.0	9
2	51.707400	900.0	9
3	47.081622	838.0	9
4	51.951187	911.0	9
5	46.965008	850.0	9



	Traffic to Lead_google_benchmark	Lead to Call_google_benchmark \
0	7.5	27.5
1	7.5	27.5
2	7.5	27.5
3	7.5	27.5
4	7.5	27.5
5	7.5	27.5

	CTR_google_evaluation	Traffic to Lead_google_evaluation \
0	Falls Short	Falls Short
1	Falls Short	Falls Short
2	Falls Short	Falls Short
3	Falls Short	Falls Short
4	Falls Short	Falls Short
5	Falls Short	Falls Short

	Lead to Call_google_evaluation
0	Meets/Exceeds
1	Meets/Exceeds
2	Meets/Exceeds
3	Meets/Exceeds
4	Meets/Exceeds
5	Meets/Exceeds

## Evaluation performance of facebook:

```
for metric in ['CTR', 'Traffic to Lead', 'Lead to Call']:
    col_name = f'{metric}_facebook_evaluation'
    summary[col_name] = summary.apply(lambda row: evaluate_performance(row, metric, 'facebook'), axis=1)
```

```
facebook_performance = summary[['Campaign Name', 'Ad Set Name']] + [col for col in summary.columns if 'facebook' in col]
```

```
facebook_performance = facebook_performance.dropna(subset=[col for col in facebook_performance.columns if 'facebook' in col])
```

Output:

Facebook Performance Evaluation:				
	Campaign Name	Ad Set Name	Impressions_facebook \	
6	LookalikeAudience	Ad Set 5	485802.0	
7	LookalikeAudience	Ad Set 6	485649.0	
8	LookalikeAudience	Ad Set 7	486623.0	
9	OpenAudience	Ad Set 5	476008.0	
10	OpenAudience	Ad Set 6	481457.0	
11	OpenAudience	Ad Set 7	477304.0	
12	Retargeting	Ad Set 5	475659.0	
13	Retargeting	Ad Set 6	477304.0	
14	Retargeting	Ad Set 7	484745.0	
	Clicks (Traffic)_facebook	CTR_facebook	Cost (INR)_facebook \	
6	23842.0	4.930921	51883.12	
7	23628.0	4.895464	51726.46	
8	23498.0	4.848743	52663.04	
9	24155.0	5.103497	52545.06	
10	23798.0	4.963152	52441.08	
11	23932.0	5.037698	53407.06	
12	24817.0	5.229813	52102.79	
13	24175.0	5.094261	53234.12	
14	24881.0	5.153942	50854.72	
	Leads_facebook	Traffic to Lead_facebook	Lead to Call_facebook \	
6	1489.0	6.285317	39.275917	
7	1494.0	6.370393	38.857919	
8	1482.0	6.340304	38.199129	
9	1459.0	6.074064	37.726515	
10	1499.0	6.330798	40.284476	
11	1485.0	6.221635	39.304449	
12	1454.0	5.890318	40.488080	
13	1484.0	6.174869	38.043189	
14	1496.0	6.050026	38.201057	
	Call_facebook	CTR_facebook_benchmark	Traffic to Lead_facebook_benchmark \	
6	585.0	2.5	13.5	
7	579.0	2.5	13.5	
8	564.0	2.5	13.5	
9	547.0	2.5	13.5	
10	601.0	2.5	13.5	
11	582.0	2.5	13.5	
12	587.0	2.5	13.5	
13	565.0	2.5	13.5	
14	571.0	2.5	13.5	
	Lead to Call_facebook_benchmark	CTR_facebook_evaluation		
6	13.5	Meets/Exceeds		
7	13.5	Meets/Exceeds		
8	13.5	Meets/Exceeds		
9	13.5	Meets/Exceeds		
10	13.5	Meets/Exceeds		
11	13.5	Meets/Exceeds		
12	13.5	Meets/Exceeds		
13	13.5	Meets/Exceeds		
14	13.5	Meets/Exceeds		
	Traffic to Lead_facebook_evaluation	Lead to Call_facebook_evaluation		
6	Falls Short	Meets/Exceeds		
7	Falls Short	Meets/Exceeds		
8	Falls Short	Meets/Exceeds		
9	Falls Short	Meets/Exceeds		
10	Falls Short	Meets/Exceeds		
11	Falls Short	Meets/Exceeds		
12	Falls Short	Meets/Exceeds		
13	Falls Short	Meets/Exceeds		
14	Falls Short	Meets/Exceeds		

## **CONCLUSION:**

The benchmark comparison analysis has provided a clear picture of how advertising campaigns on Google and Facebook perform relative to industry benchmarks. The results reveal specific areas where the metrics either meet or exceed the thresholds, indicating successful strategies, as well as areas where performance falls short, highlighting opportunities for improvement. For instance, while the CTR on Facebook exceeds the benchmark, the CTR on Google needs enhancement. Similarly, the lead to call ratios on both platforms exceed benchmarks, suggesting the need to manage the volume of offline consultancies. By focusing on these insights, businesses can refine their marketing strategies, enhance their campaign effectiveness, and ultimately drive better revenue outcomes. This comprehensive evaluation serves as a vital tool for ongoing performance optimization and strategic planning in digital marketing.