

Marketing Campaign Performance Analysis: Insights and Recommendations.

Parameters considered: • Cost per click analysis. • Click through rate. • Unique clicks. • Unique link clicks.

```
In [ ]: import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
```

```
In [3]: sns.set_style('whitegrid')
```

```
In [4]: marketdata=pd.read_csv(r'marketdata.csv')
```

In [5]: marketdata.head()

		Principal,	Principal,		Principal,									
		SHU_6	Educators	45-	Group 1									
2	Campaign 1	(Educators and Principals)	and Principals	54	(Australia, Canada, United Kingdom, Gh...	2867	6283	2.191489	198	145	65	3.151361	5.057551	319.38
3	Campaign 1	SHU_6 (Educators and Principals)	Educators and Principals	55-64	Group 1 (Australia, Canada, United Kingdom, Gh...	889	1890	2.125984	49	40	21	2.592593	4.499438	86.25
4	Campaign 2	SHU3_ (Students Apart from India and US)	Students	18-24	Group 2 (Australia, Canada, United Kingdom, Gh...	29675	39161	1.319663	2593	1994	1095	6.621384	6.719461	1193.94

```
In [6]: marketdata.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 33 entries, 0 to 32
Data columns (total 16 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   Campaign ID                           33 non-null    object
1   Campaign Name                         33 non-null    object
2   Audience                             33 non-null    object
3   Age                                   33 non-null    object
4   Geography                             33 non-null    object
5   Reach                                 33 non-null    int64
6   Impressions                           33 non-null    int64
7   Frequency                             33 non-null    float64
8   Clicks                                33 non-null    int64
9   Unique Clicks                         33 non-null    int64
10  Unique Link Clicks (ULC)               33 non-null    int64
11  Click-Through Rate (CTR)               33 non-null    float64
12  Unique Click-Through Rate (Unique CTR) 33 non-null    float64
13  Amount Spent in INR                   33 non-null    float64
14  Cost Per Click (CPC)                   33 non-null    float64
15  Cost per Result (CPR)                  33 non-null    float64
dtypes: float64(6), int64(5), object(5)
memory usage: 4.2+ KB
```

```
In [11]: marketdata.dropna()
```

Out[11]:

Campaign Name	Audience	Age	Geography	Reach	Impressions	Frequency	Clicks	Unique Clicks	Unique Link Clicks (ULC)	Click-Through Rate (CTR)	Unique Click-Through Rate (Unique CTR)	Amount Spent in INR
SHU_6 (Educators and Principals)	Educators and Principals	25-34	Group 1 (Australia, Canada, United Kingdom, Gh...	11387	23283	2.044700	487	406	180	2.091655	3.565469	1092.24
SHU_6 (Educators and Principals)	Educators and Principals	35-44	Group 1 (Australia, Canada, United Kingdom, Gh...	8761	15683	1.790092	484	376	154	3.086144	4.291748	835.46
SHU_6 (Educators and Principals)	Educators and Principals	45-54	Group 1 (Australia, Canada, United Kingdom, Gh...	2867	6283	2.191489	198	145	65	3.151361	5.057551	319.38
SHU_6 (Educators and Principals)	Educators and Principals	55-64	Group 1 (Australia, Canada, United Kingdom, Gh...	889	1890	2.125984	49	40	21	2.592593	4.499438	86.25
SHU3_ (Students Apart from India and US)	Students	18-24	Group 2 (Australia, Canada, United Kingdom, Gh...	29675	39161	1.319663	2593	1994	1095	6.621384	6.719461	1193.94
SHU3_ (Students Apart from India and US)	Students	13-17	Group 2 (Australia, Canada, United Kingdom, Gh...	14753	25705	1.742357	969	698	435	3.769695	4.731241	299.51
SHU3_ (Students Apart from India and US)	Students	25-34	Group 2 (Australia, Canada, United Kingdom, Gh...	2066	2447	1.184414	181	141	65	7.396812	6.824782	85.57
SHU_Students(Australia)	Students	13-17	Australia	2271	2616	1.151915	61	55	28	2.331804	2.421841	475.85
SHU_Students(Australia)	Students	18-24	Australia	704	734	1.042614	49	46	13	6.675749	6.534091	283.17
SHU_Students(Australia)	Students	25-34	Australia	212	222	1.047170	9	8	3	4.054054	3.773585	91.66
SHU_Students (Canada)	Students	13-17	Canada	2330	3146	1.350215	101	84	63	3.210426	3.605150	528.08
SHU_Students (Canada)	Students	18-24	Canada	759	878	1.156785	52	44	34	5.922551	5.797101	294.82
SHU_Students (Canada)	Students	25-34	Canada	218	243	1.114679	18	18	15	7.407407	8.256881	101.06
SHU_Students(Ghana)	Students	18-24	Ghana	5952	6943	1.166499	284	238	98	4.090451	3.998656	378.10
SHU_Students(Ghana)	Students	25-34	Ghana	3717	4620	1.242938	184	160	46	3.982684	4.304547	282.22
SHU_Students(Ghana)	Students	13-17	Ghana	5355	8920	1.665733	180	154	93	2.017937	2.875817	177.46
SHU_Students (India)	Students	18-24	India	30110	35372	1.174759	1308	1162	934	3.697840	3.859183	894.00
SHU_Students (India)	Students	25-34	India	1721	1874	1.088902	92	76	53	4.909285	4.416037	61.21
SHU_Students(Nepal)	Students	18-24	Nepal	18900	36659	1.939630	849	688	306	2.315939	3.640212	634.64
SHU_Students(Nepal)	Students	13-17	Nepal	6145	19474	3.169081	325	246	129	1.668892	4.003255	211.76

	Campaign Name	Audience	Age	Geography	Reach	Impressions	Frequency	Clicks	Unique Clicks	Unique Link Clicks (ULC)	Click-Through Rate (CTR)	Unique Click-Through Rate (Unique CTR)	Amount Spent in INR
	SHU_Students(Nepal)	Students	25-34	Nepal	4623	9082	1.964525	246	212	83	2.708654	4.585767	188.84
	SHU_Students (Nigeria)	Students	18-24	Nigeria	11027	13820	1.253287	1491	1132	548	10.788712	10.265711	542.67
	SHU_Students (Nigeria)	Students	13-17	Nigeria	8516	12372	1.452795	970	696	408	7.840285	8.172851	282.21
	SHU_Students (Nigeria)	Students	25-34	Nigeria	2386	2782	1.165968	304	230	117	10.927390	9.639564	117.90
	SHU_Students(UAE)	Students	25-34	UAE	2892	3347	1.157331	135	102	41	4.033463	3.526971	455.49
	SHU_Students(UAE)	Students	18-24	UAE	2862	3234	1.129979	72	60	27	2.226345	2.096436	316.14
	SHU_Students(UAE)	Students	13-17	UAE	1579	2079	1.316656	35	32	20	1.683502	2.026599	104.63
	SHU_Students(UK)	Students	13-17	UK	2557	2941	1.150176	69	60	33	2.346141	2.346500	487.52
	SHU_Students(UK)	Students	18-24	UK	741	785	1.059379	39	34	20	4.968153	4.588394	255.57
	SHU_Students(UK)	Students	25-34	UK	338	365	1.079882	13	11	4	3.561644	3.254438	113.58
	SHU_Students (USA)	Students	13-17	USA	2159	2465	1.141732	126	111	95	5.111562	5.141269	691.28
	SHU_Students (USA)	Students	18-24	USA	305	332	1.088525	43	37	28	12.951807	12.131148	159.14
	SHU_Students (USA)	Students	25-34	USA	91	103	1.131868	9	8	3	8.737864	8.791209	47.26

```
In [13]: marketdata['Campaign ID'] = marketdata['Campaign ID'].replace(['Campaign 1', 'Campaign 2','Campaign 3','Campaign 4',
marketdata.sample())
```

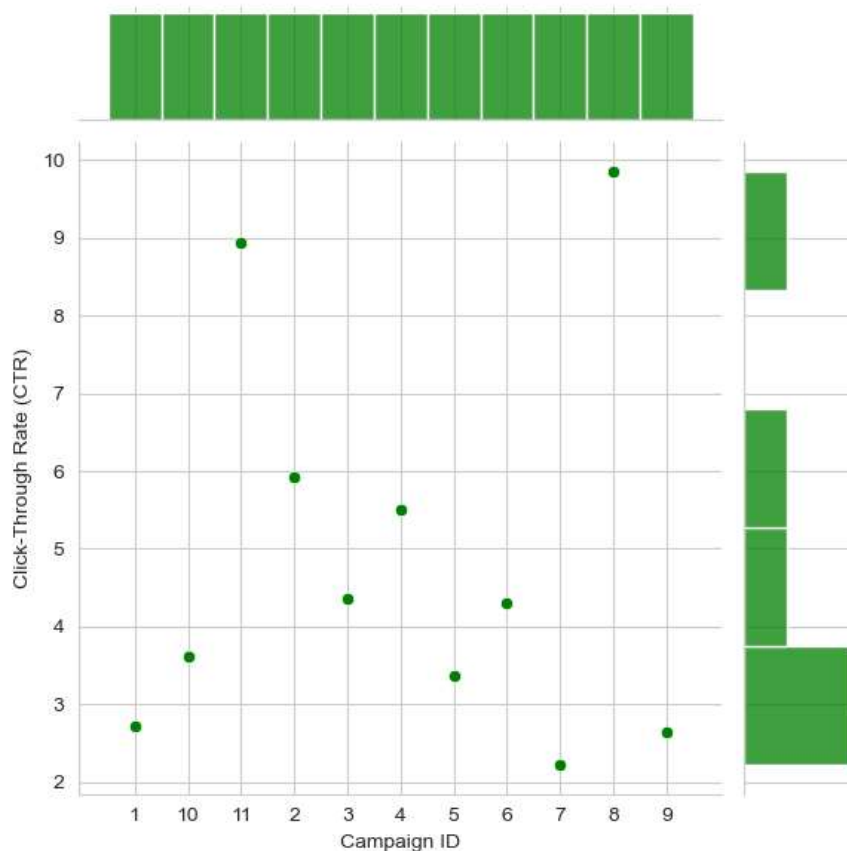
Out[13]:

	Campaign ID	Campaign Name	Audience	Age	Geography	Reach	Impressions	Frequency	Clicks	Unique Clicks	Unique Link Clicks (ULC)	Click-Through Rate (CTR)	Unique Click-Through Rate (Unique CTR)
24	9	SHU_Students(UAE)	Students	25-34	UAE	2892	3347	1.157331	135	102	41	4.033463	3.526971

```
In [29]: grouped_df = marketdata.groupby('Campaign ID').agg({'Clicks': 'sum', 'Click-Through Rate (CTR)': 'mean'}).reset_index()
grouped_df = grouped_df.sort_values('Campaign ID')
```

```
In [32]: sns.jointplot(x='Campaign ID',y='Click-Through Rate (CTR)',data=grouped_df, color='green')
```

```
Out[32]: <seaborn.axisgrid.JointGrid at 0x15f130c7970>
```



Among the campaigns with the lowest click-through rates (CTR), campaigns 3 and 10 stand out as consistently underperforming. Despite the significant amount spent on these campaigns, they fail to generate the desired level of engagement, indicating a need for in-depth analysis and adjustments to enhance their effectiveness.

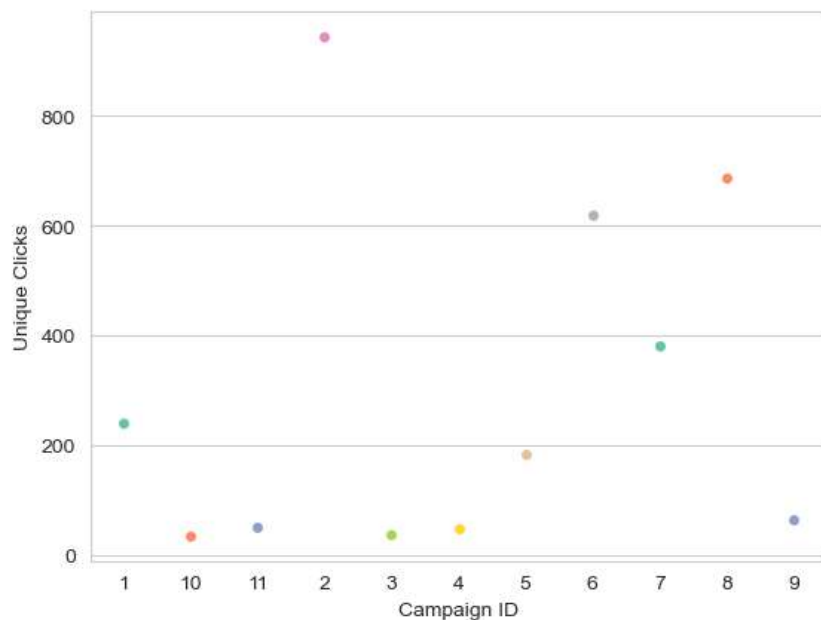
```
In [33]: grouped_df = marketdata.groupby('Campaign ID').agg({'Clicks': 'sum', 'Unique Clicks': 'mean'}).reset_index()
grouped_df = grouped_df.sort_values('Campaign ID')
```

```
In [35]: sns.swarmplot(x='Campaign ID',y='Unique Clicks',data=grouped_df,palette='Set2')
```

C:\Users\VARSHA\AppData\Local\Temp\ipykernel_7228\2960658090.py:1: FutureWarning: Passing `palette` without assigning `hue` is deprecated.

```
sns.swarmplot(x='Campaign ID',y='Unique Clicks',data=grouped_df,palette='Set2')
```

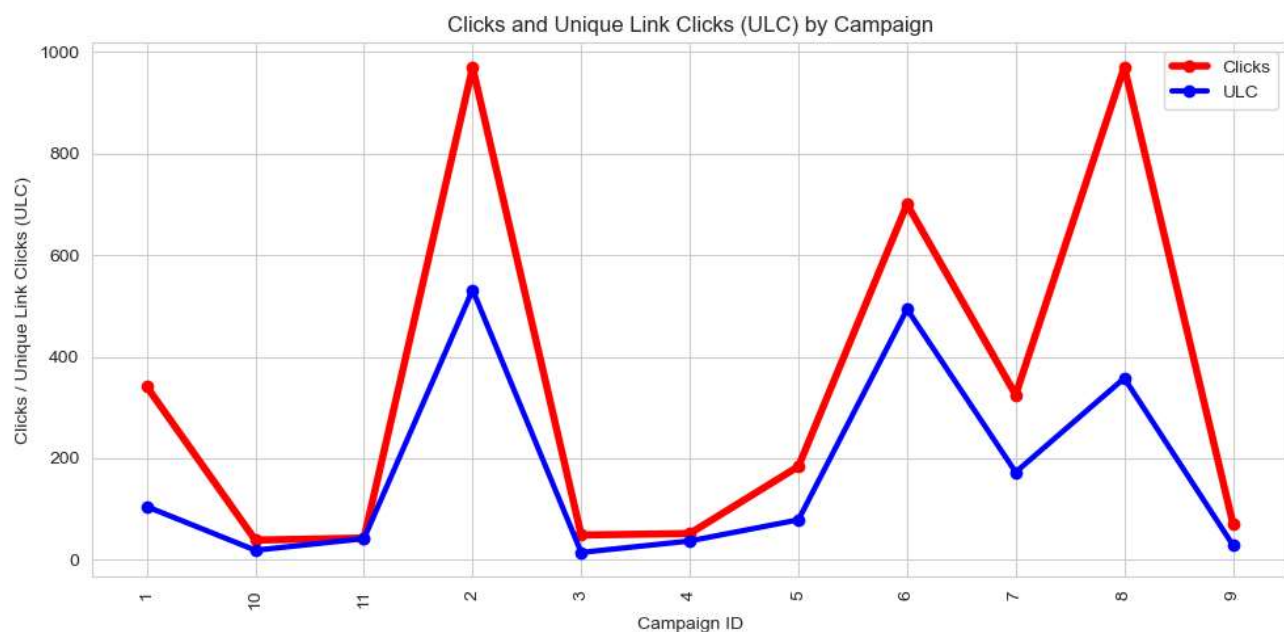
```
Out[35]: <Axes: xlabel='Campaign ID', ylabel='Unique Clicks'>
```



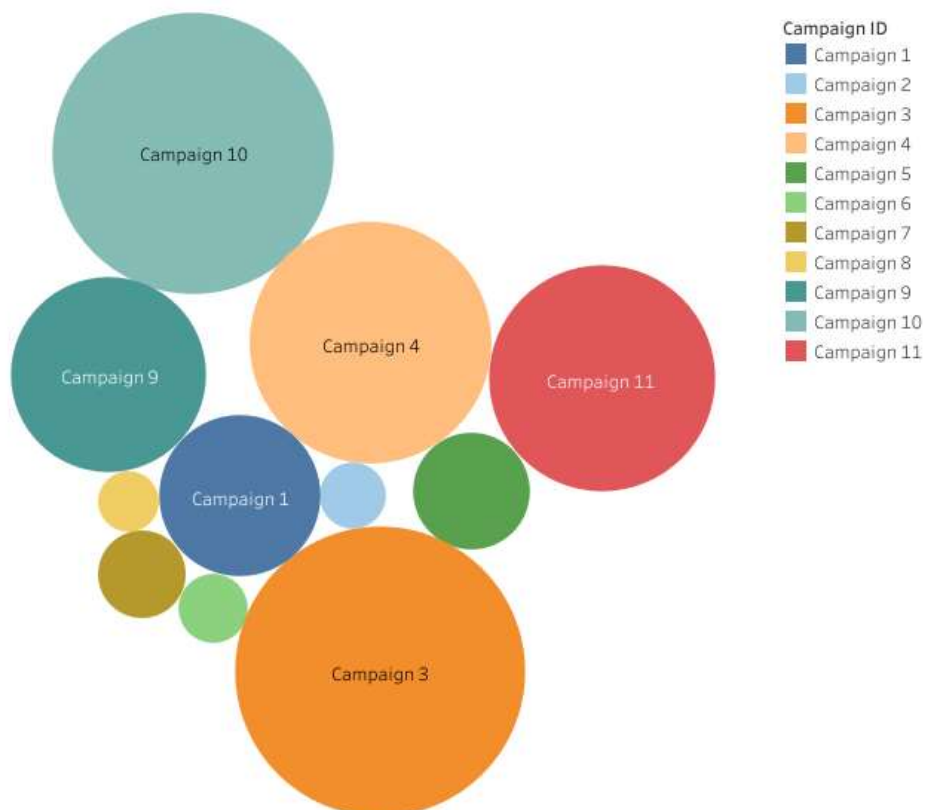
High cost per click in Campaigns 3 and 10 suggests that clicks on ads from these campaigns are more expensive. This could be due to intense keyword competition or low click-through rates. To address this, optimizing targeting, improving ad relevance, and refining keyword selection can help decrease costs and maximize campaign effectiveness.

```
In [38]: grouped_df = marketdata.groupby('Campaign ID').agg({'Clicks': 'median', 'Unique Link Clicks (ULC)': 'mean'}).reset_index()
grouped_df = grouped_df.sort_values('Campaign ID')
```

```
In [39]: plt.figure(figsize=(10, 5))
plt.plot(grouped_df['Campaign ID'], grouped_df['Clicks'], label='Clicks', color='red', marker = 'o', linewidth = 4)
plt.plot(grouped_df['Campaign ID'], grouped_df['Unique Link Clicks (ULC)'],color='blue',marker = 'o', label='ULC',
plt.xlabel('Campaign ID')
plt.ylabel('Clicks / Unique Link Clicks (ULC)')
plt.title('Clicks and Unique Link Clicks (ULC) by Campaign')
plt.xticks(rotation='vertical')
plt.tight_layout()
plt.legend()
plt.show()
```



Sheet 1



Out of all campaign, cost per click for both 3 and 10 are the highest.

After carefully analyzing the data and reviewing the supporting graphs, it is evident that campaigns 3 and 10 are underperforming compared to the others. The metrics, such as impressions, reach, and click-through rate, indicate that these campaigns are not resonating well with the target audience

As per analysing the data and based on the graphs that we showed as proof, campaign 3 and 10 should be discontinued and removed and spend more time in other campaign.