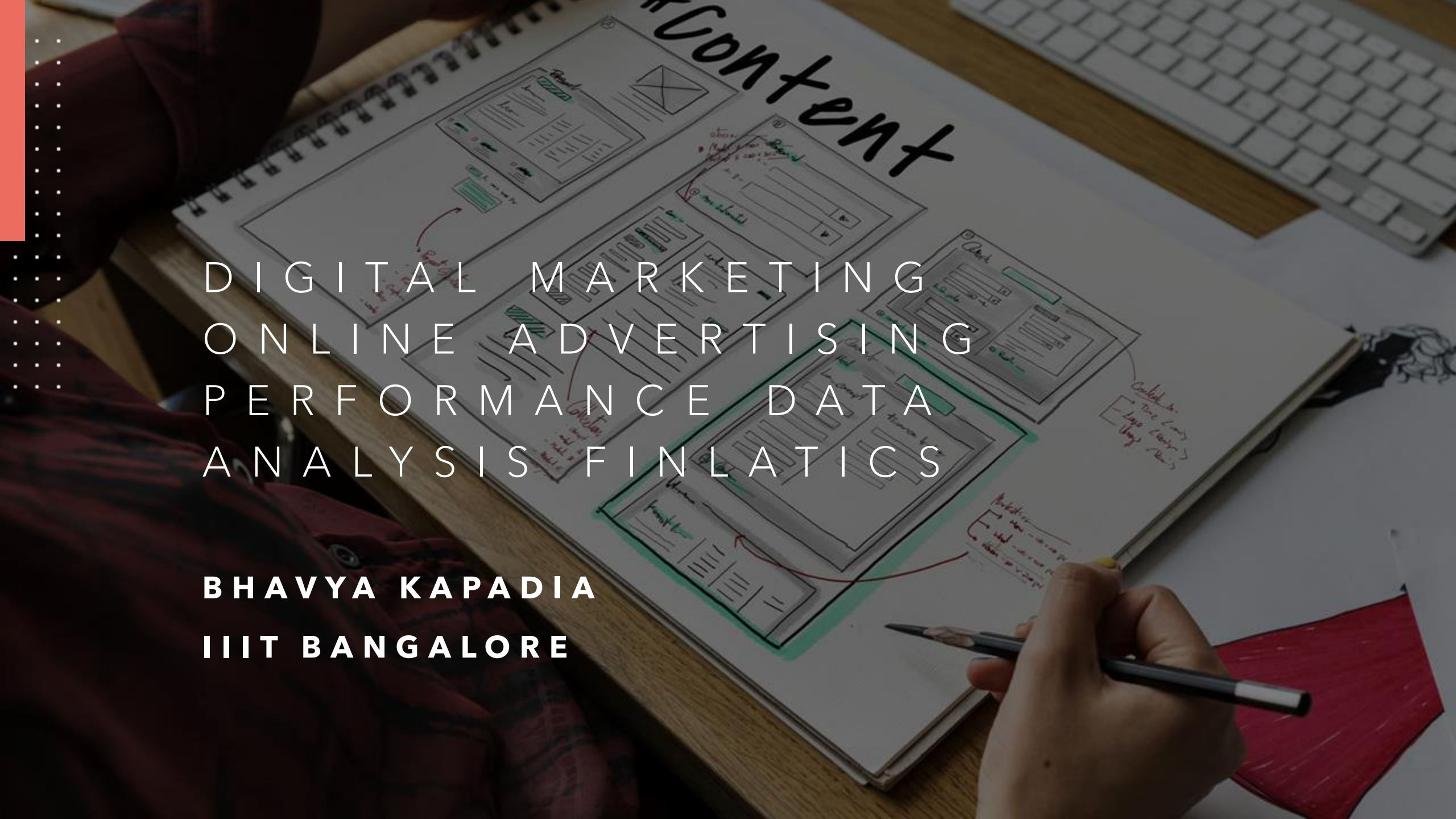
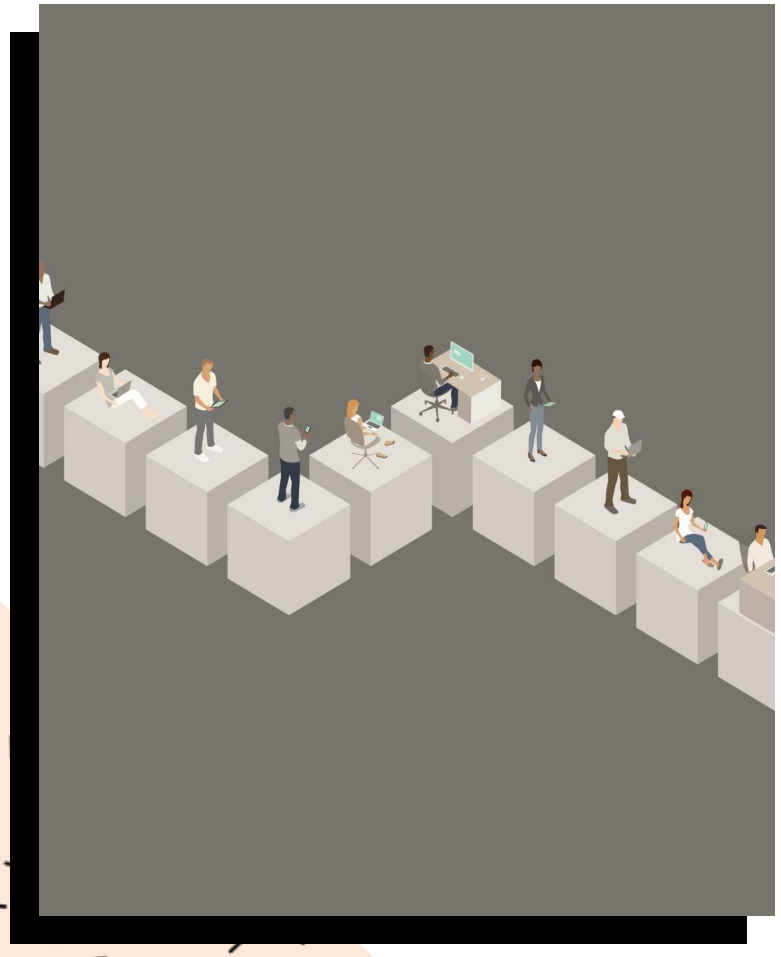


DIGITAL MARKETING ONLINE ADVERTISING PERFORMANCE DATA ANALYSIS FINLATICS

BHAVYA KAPADIA

IIIT BANGALORE

METRICS OF THE DATASET



- **Day**: *Date of the advertising campaign.*
- **Campaign**: *Segmentation variable set by Company X to target specific user groups.*
- **User Engagement**: *Level of engagement of users targeted by the campaign.*
- **Banner**: *Size of the advertisement served by Advert Firm A.*
- **Placement**: *Publisher space where the ad is served, such as websites or apps.*
- **Displays**: *Number of ads served during the campaign period.*
- **Cost**: *Price paid by Advert Firm A to send ads to publishers, reflecting placement cost.*
- **Clicks**: *Number of times users clicked on the advertisements during the campaign.*
- **Revenue**: *Price paid by Company X to Advert Firm A for the clicks generated.*
- **Post Click Conversions**: *On-site transactions occurring within 30 days after a user clicks on the ad.*
- **Post Click Sales Amount**: *Monetary value of on-site transactions occurring within 30 days after a user clicks on the ad.*
- **Engagement**: *Signifies the type of users targeted by the campaign based on behavior or characteristics.*

WHAT IS THE OVERALL TREND IN USER ENGAGEMENT THROUGHOUT THE CAMPAIGN PERIOD?

- Medium engagements slightly surpass both Low and High user engagements, holding a slight edge in comparison.

- Examining the data in terms of campaign numbers:

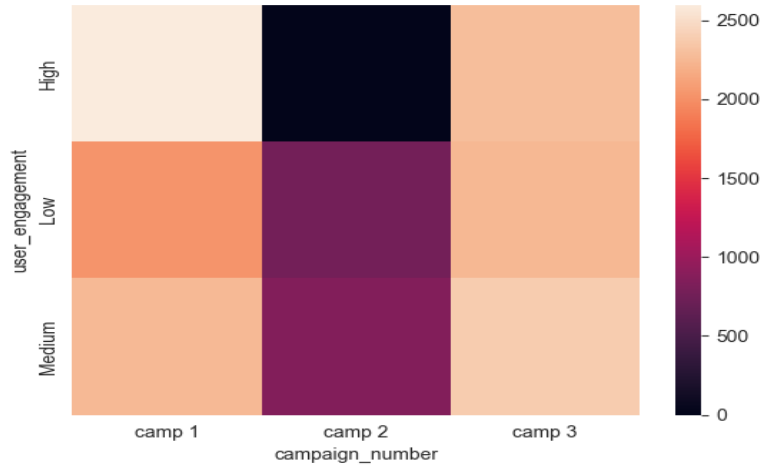
1. For Campaign 1, user engagements are nearly equal across categories but show a slight edge in High engagements.

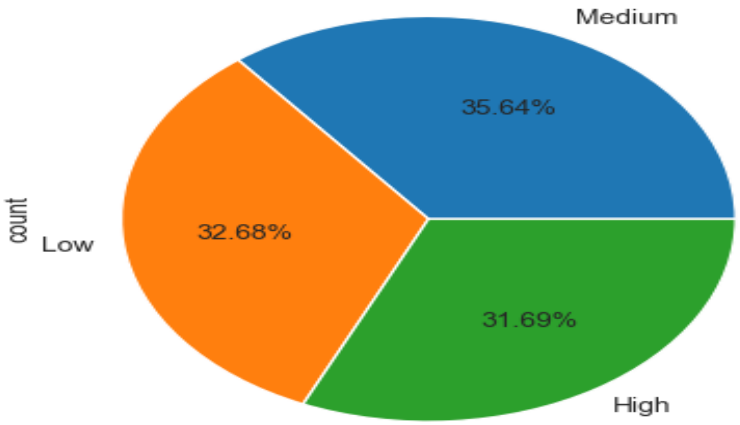
2. Campaign 2 records engagements primarily in Low and Medium categories.

3. In the case of Campaign 3, engagements are nearly balanced across all types.

- The camp 1 category, exhibiting high user engagement, is characterized by the maximum number of user engagements observed in the heatmap.

- The camp 2 category, marked by high user engagement, registers zero values in the heatmap.





HOW DOES THE SIZE OF THE AD (BANNER) IMPACT THE NUMBER OF CLICKS GENERATED?

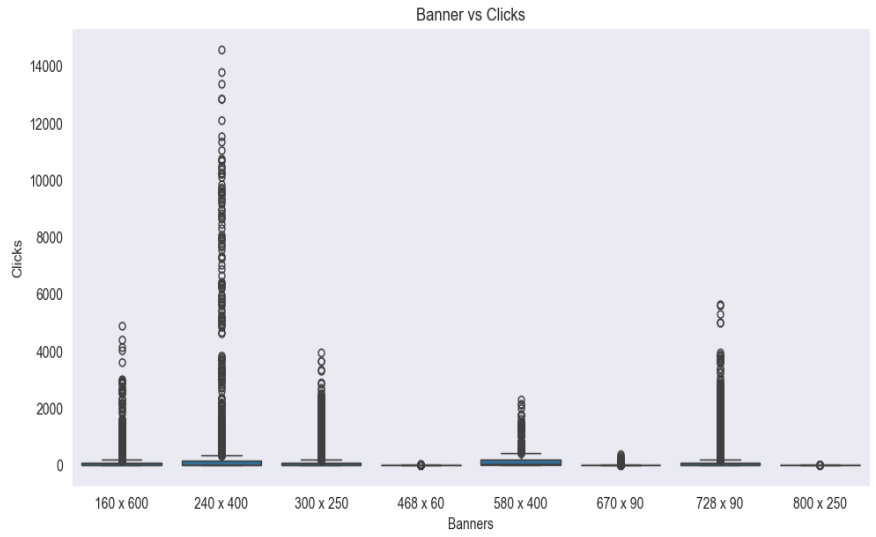
- As shown in the boxplot, there are numerous outliers in each section regarding the size of the ad and the number of clicks.

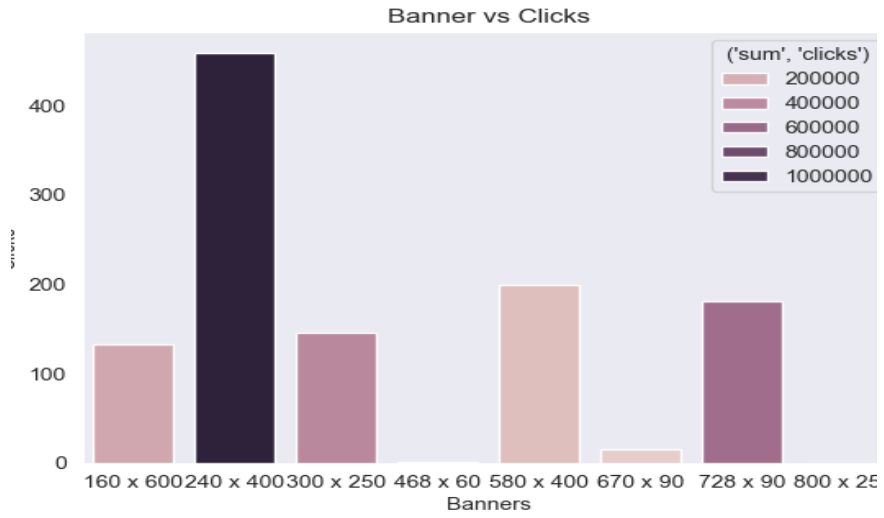
- Each section is represented by a bar plot displaying the mean central tendency alongside a 95% Confidence Interval.

- The category 240 x 400 exhibits the highest mean and sum of the number of clicks, followed by approximately equal values for other sections.

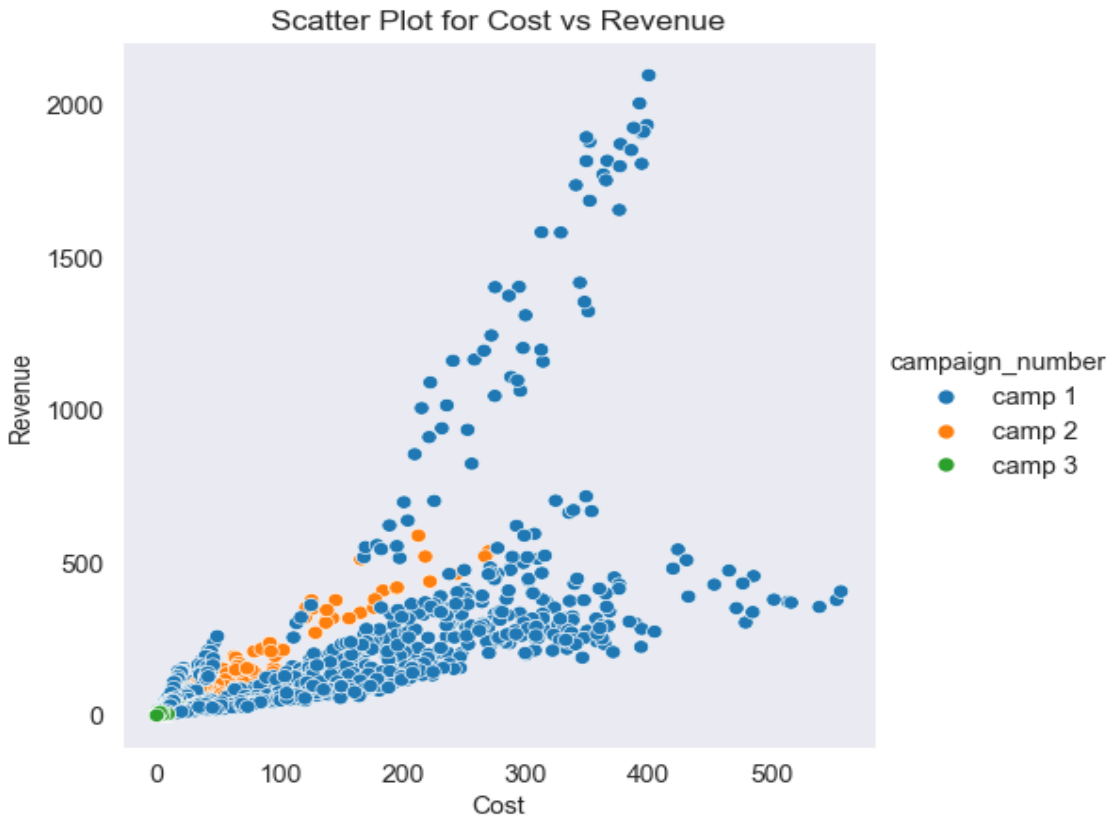
- However, the mean for categories 468 x 60 and 800 x 250 is nearly zero.

- Hence, the distribution of mean clicks versus the size of the ad is *non-uniform*, as evident from the bar plot generated from the pivot table.





IS THERE A CORRELATION BETWEEN THE COST OF SERVING ADS AND THE REVENUE GENERATED FROM CLICKS?



- Both the cost and revenue exhibit positive skewness and kurtosis.

- The scatterplot illustrates a positive correlation coefficient.

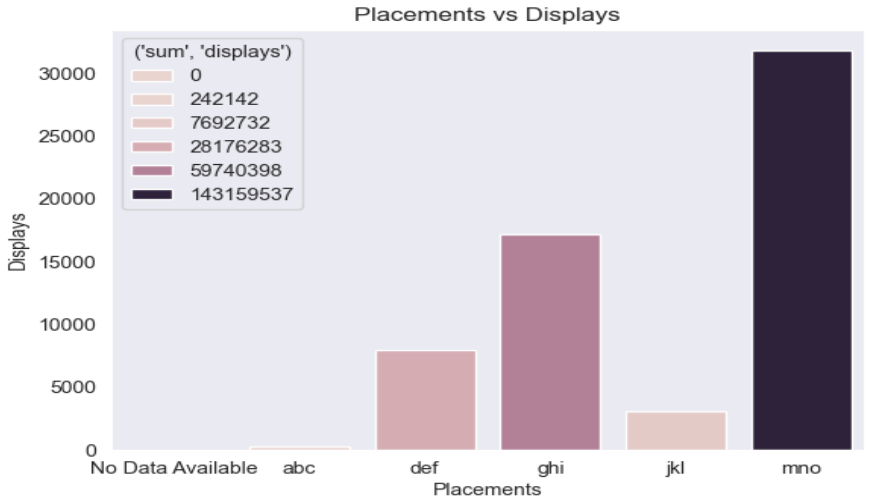
- A correlation coefficient of 0.7605 indicates strong positive linear relationship between cost and revenue.

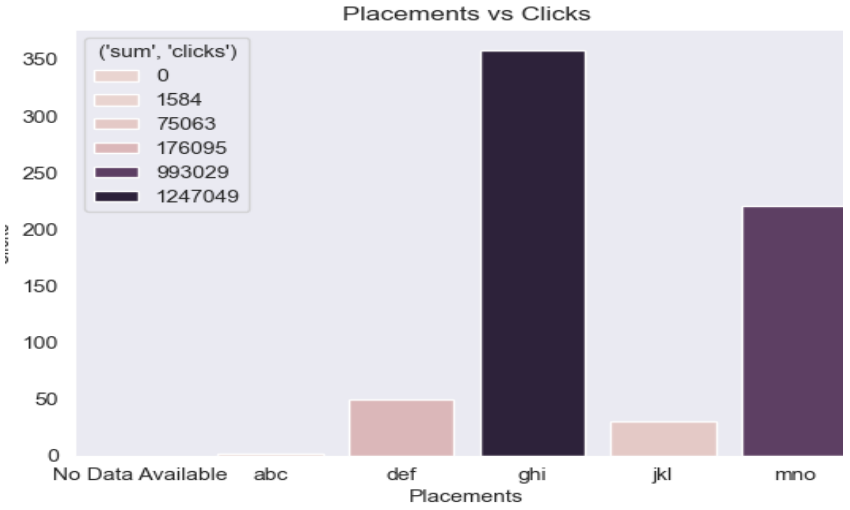
- Some outliers display notably high costs paired with low revenue, deviating significantly from the expected values in the plot.

WHICH PUBLISHER SPACES (PLACEMENTS) YIELDED THE HIGHEST NUMBER OF DISPLAYS AND CLICKS?

- The publisher "GHI" stands out with the highest mean and sum of clicks, while "ABC" lags behind with the least.

- The publisher "MNO" achieves the highest mean and total number of displays, while "ABC" yields the lowest.



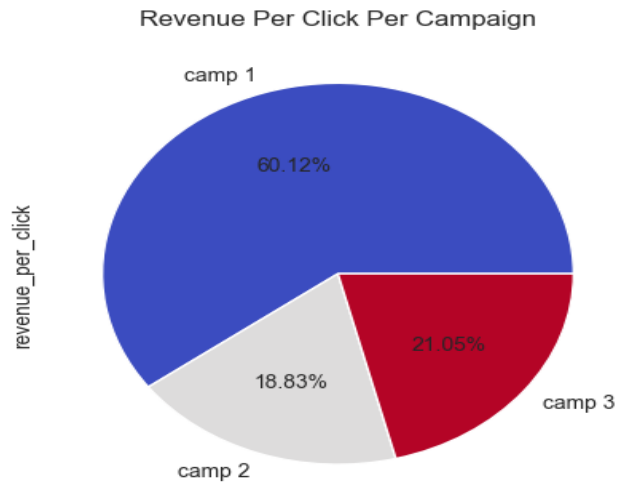


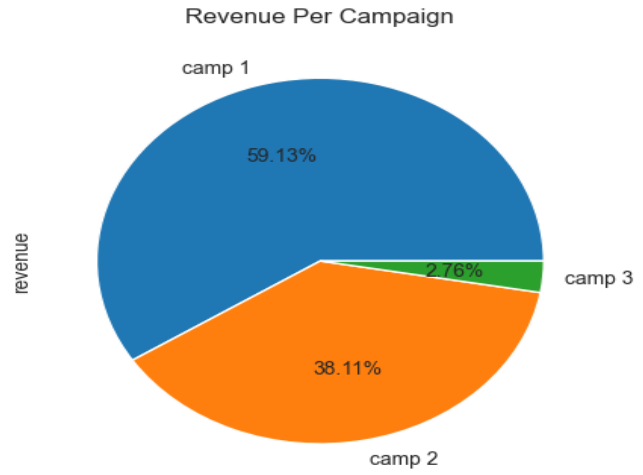
WHAT IS THE AVERAGE REVENUE GENERATED PER CLICK FOR COMPANY X DURING THE CAMPAIGN PERIOD?

- The mean revenue generated per click for Company X during the campaign period is approximately 17.94.

- The pie chart highlights that Campaign 1 boasts the highest mean revenue generated per campaign, while Campaign 3 records the lowest.

- The pie chart illustrates the variability in the average revenue per click across campaigns, showcasing Campaign 1 with the highest mean revenue per click and Campaign 2 with the lowest.

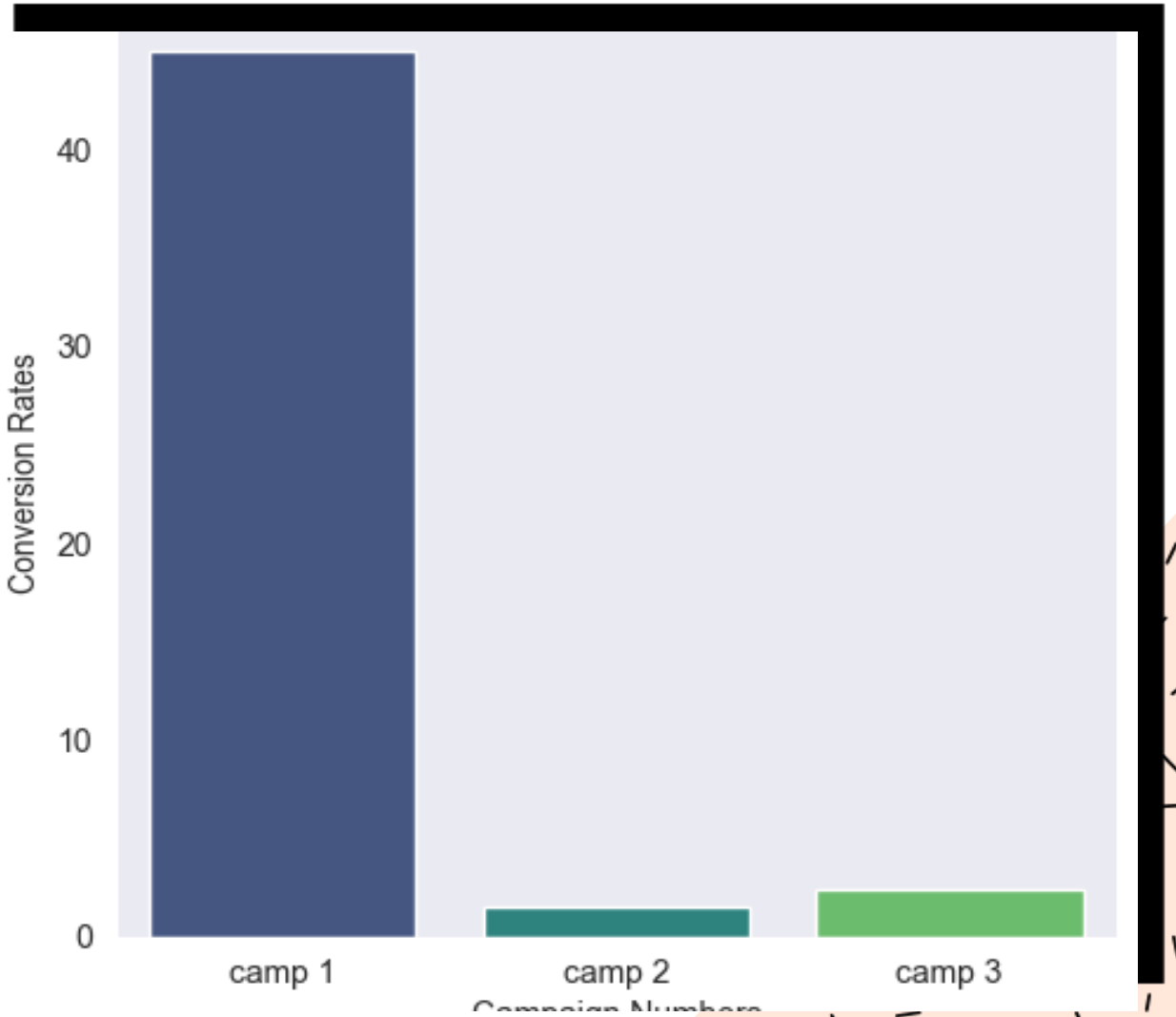


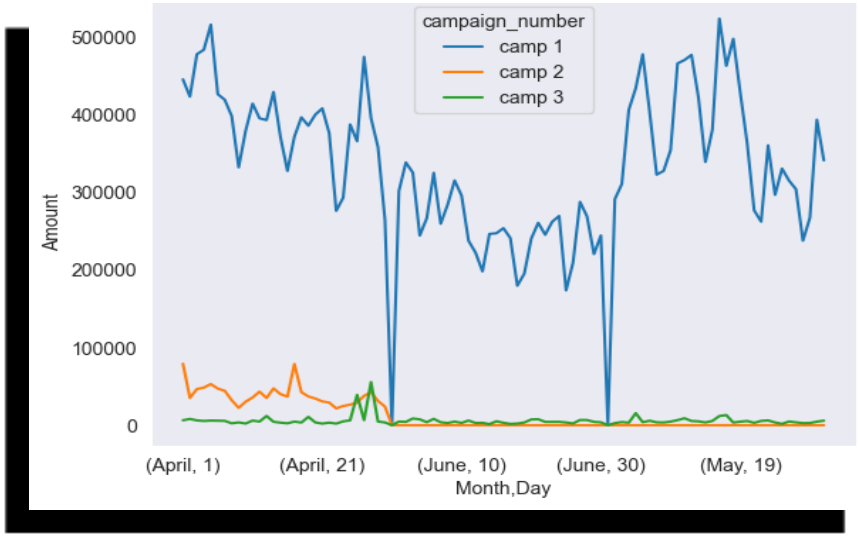


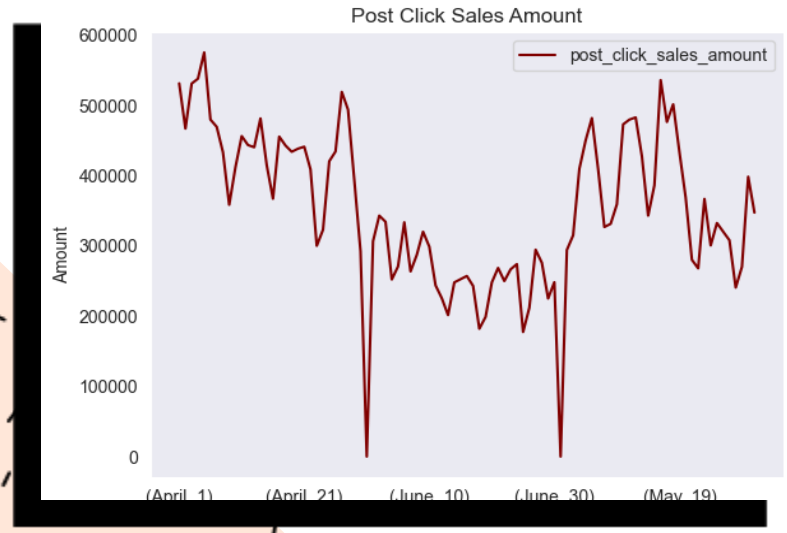
WHICH CAMPAIGNS HAD THE HIGHEST POST-CLICK CONVERSION RATES?

- The aggregate post-click conversion rate for all campaigns combined is approximately 26.15%.

- Indeed, based on the data, it is evident that Campaign 1 exhibits the highest post-click conversion rate (44.93%), demonstrating clear dominance over Campaigns 2 and 3 in terms of driving on-site transactions following ad clicks.







ARE THERE ANY SPECIFIC TRENDS OR PATTERNS IN POST-CLICK SALES AMOUNTS OVER TIME?

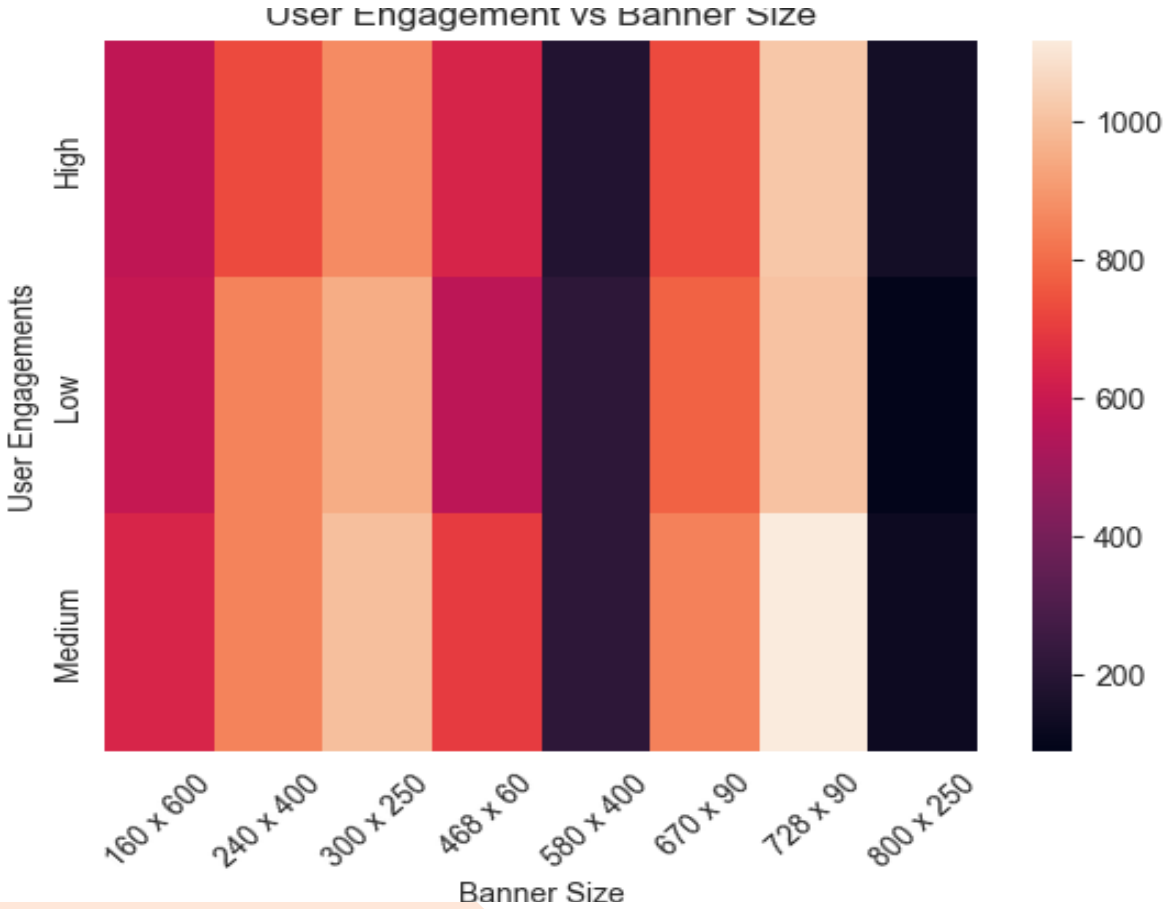
- Sales amounts reach their peak around April 4-5 and decrease notably around April 30.

- Following April 30, there's a subsequent increase in sales amounts, yet they fail to exceed their initial peak before declining back to zero around June 30.

- Following the decline around June 30, sales amounts experience a resurgence, reaching their second highest peak around May 16, and subsequently fluctuate with typical ups and downs.

- Campaign 1 significantly outperforms in post-click sales amount, followed by Campaign 2 and Campaign 3, which generate nearly equal sales but substantially less compared to Campaign 1.

HOW DOES THE LEVEL OF USER ENGAGEMENT VARY ACROSS DIFFERENT BANNER SIZES?



- Engagement levels across both 160 x 600 and 728 x 90 banners were largely comparable, with a slight preference towards 'medium' engagement.

- 'Medium' engagement takes precedence in both 300 x 250 and 670 x 90 banners, followed by 'low' and then 'high' engagement levels.

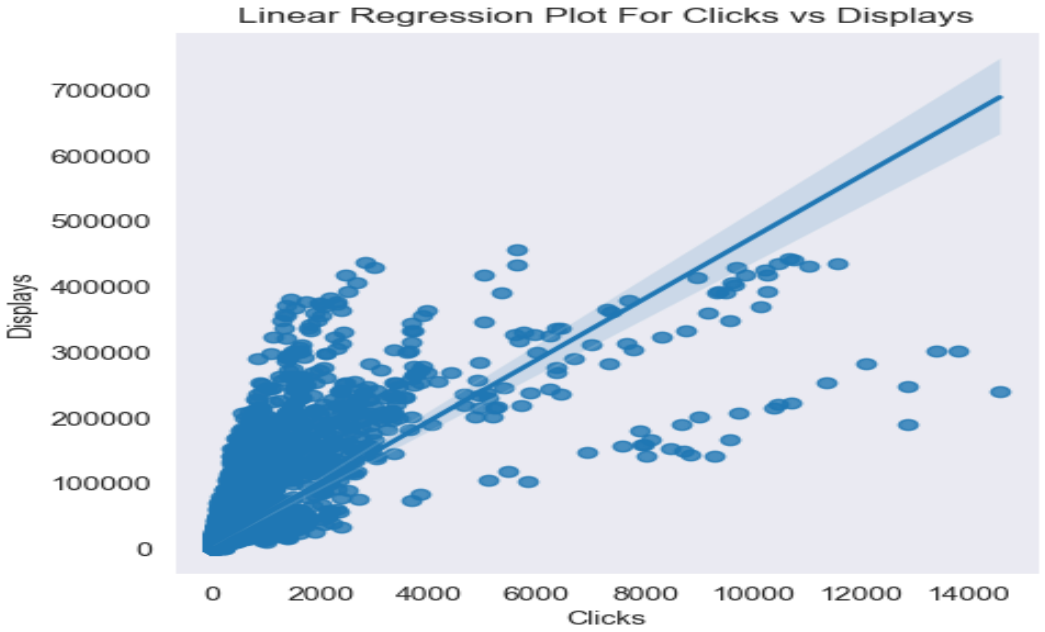
- Engagement levels are equivalent between 'low' and 'medium' for both 240 x 400 and 580 x 400 banners, both of which exceed 'high' engagement levels.

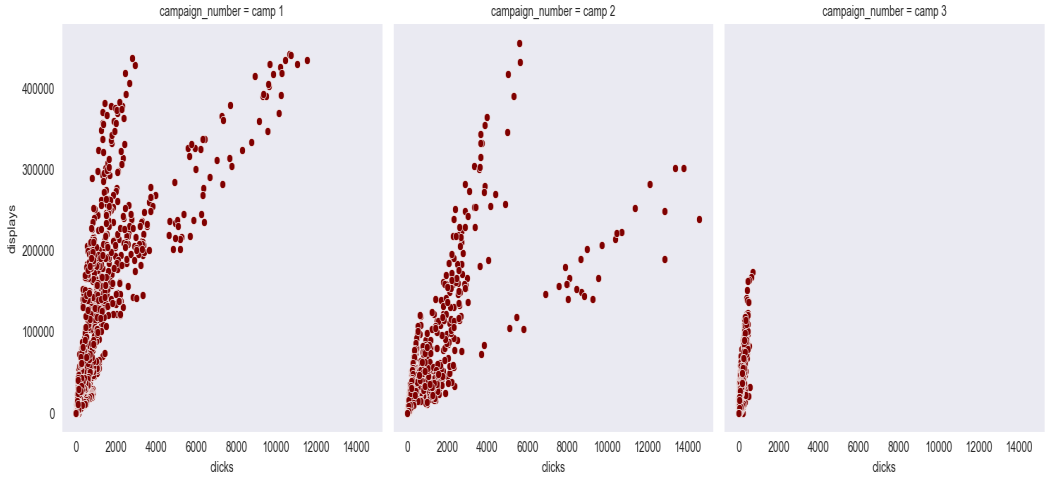
- In the case of the 468 x 60 banner, 'medium' engagement takes the lead in user engagement.

- In the case of the largest banner size, 800 x 250, 'high' user engagement predominates over the other categories.

- Hence the distribution of user engagement levels and banner size is non-uniform.

These trends are depicted visually in a heatmap, stacked bar graph, and multivariable bar graph, providing insights into the varying levels of user engagement across different banner sizes.





CAN WE IDENTIFY ANY SEASONAL PATTERNS OR FLUCTUATIONS IN DISPLAYS AND CLICKS THROUGHOUT THE CAMPAIGN PERIOD?

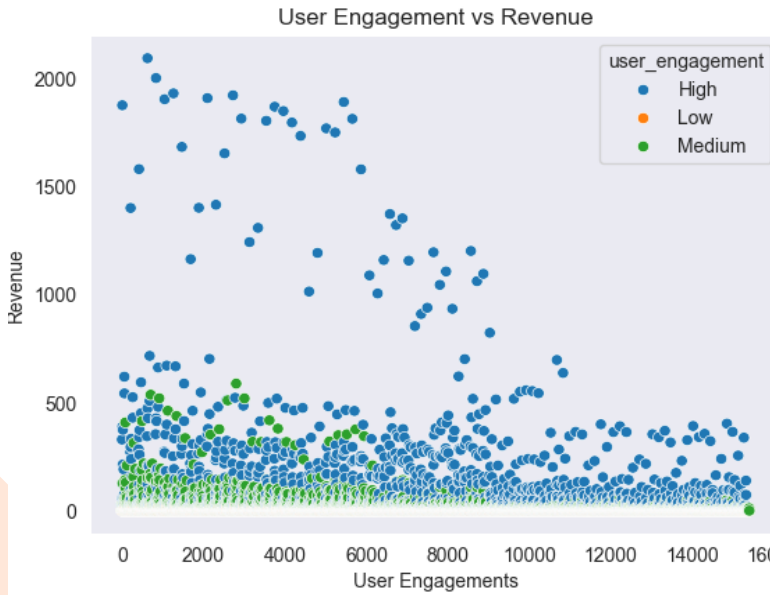
- The correlation coefficient between clicks and displays is 0.7669, indicating a strong positive correlation between these two variables.

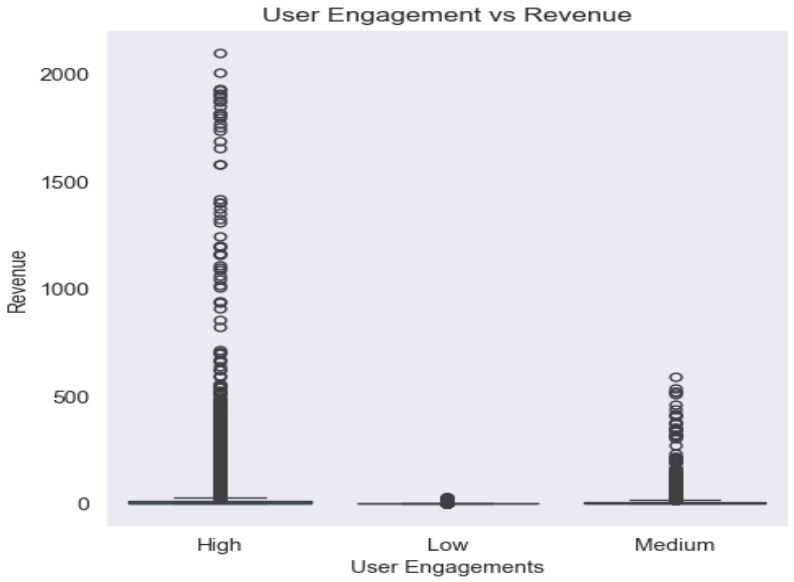
- Outliers, such as instances where the number of clicks exceeds 12,000 while the displays fall within the range of 200,000 to 300,000, are present in the dataset. These outliers represent data points that significantly deviate from the overall pattern observed in the scatter plot.

- According to the Linear Regression Model, it suggests that the displays for the above outliers should have been around 700,000, indicating a substantial difference from the observed values.

- Comparing displays with respect to 2000 clicks, Campaign 1 exhibits the maximum number of displays, followed by Campaign 2. Unfortunately, the number of clicks in Campaign 3 is significantly low, falling below the 2000 threshold.

IS THERE A CORRELATION BETWEEN USER ENGAGEMENT LEVELS AND THE REVENUE GENERATED?





- Total and mean revenue is maximized when targeting users with 'high' engagement levels, followed by those with 'medium' and 'low' engagement levels, respectively.

- Despite the low median revenues overall, the "medium" engagement group's median revenue surpasses that of the "high" group, which in turn exceeds that of the "low" group.

- Outliers are present across all sections, particularly notable in the high and medium user engagement categories.

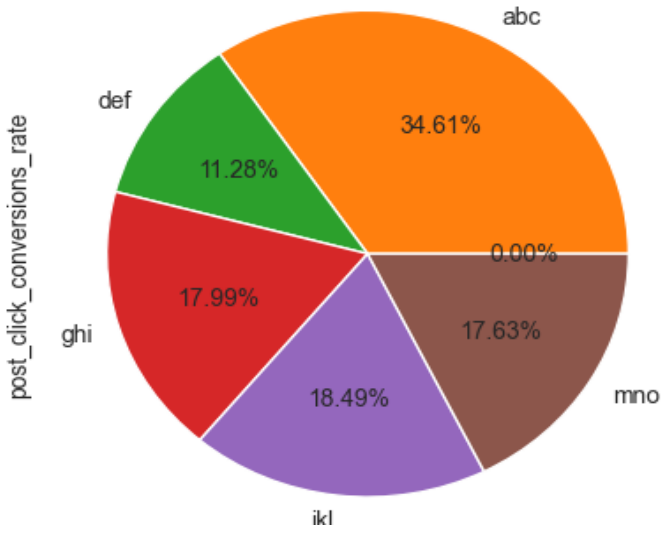
- The correlation between user engagement and revenue generated is negligible, with a coefficient of 0.1344.

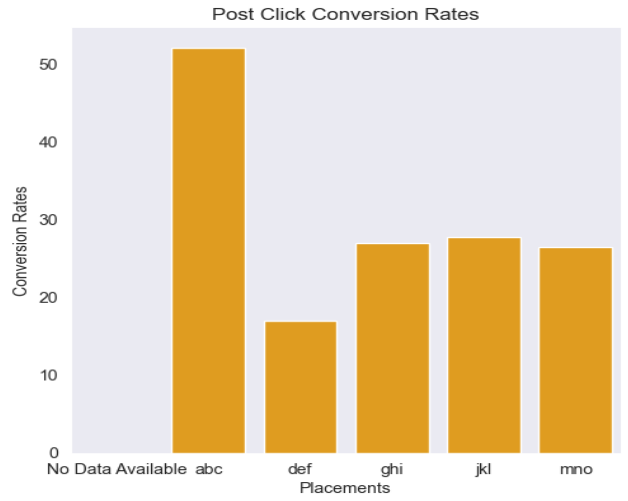
WHICH PLACEMENT TYPES RESULT IN THE HIGHEST POST-CLICK CONVERSION RATES?

- The publisher 'abc' stands out with an impressive post-click conversion rate of 52.02%, showcasing its dominance in this aspect.

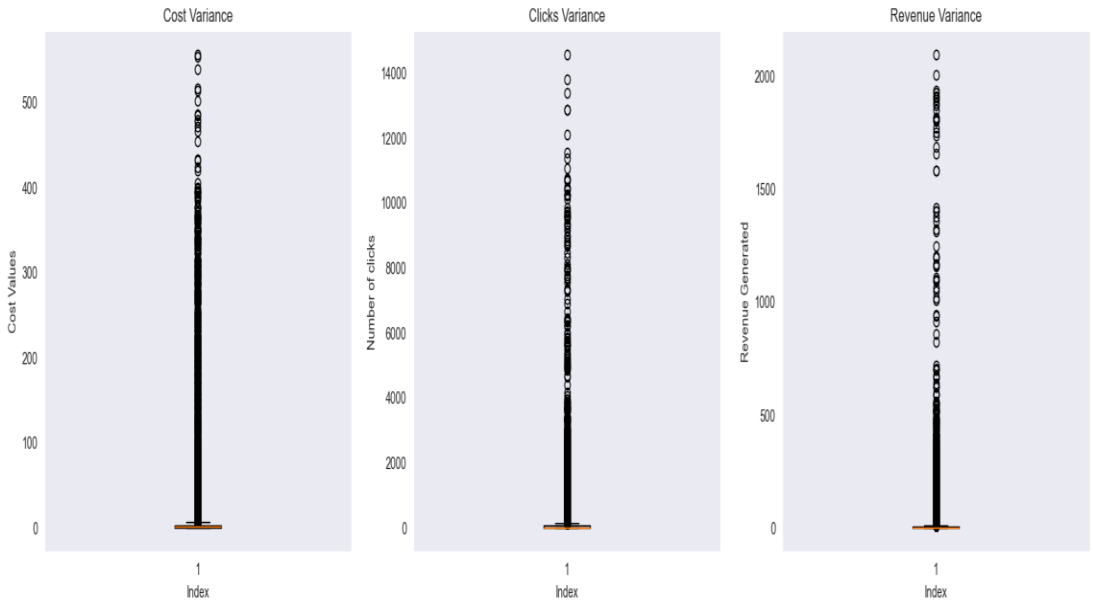
- The publishers 'ghi', 'jkl', and 'mno' demonstrate nearly identical conversion rates, all slightly surpassing half of that achieved by 'abc'.

- The conversion rate for 'def' is the lowest among all publishers.





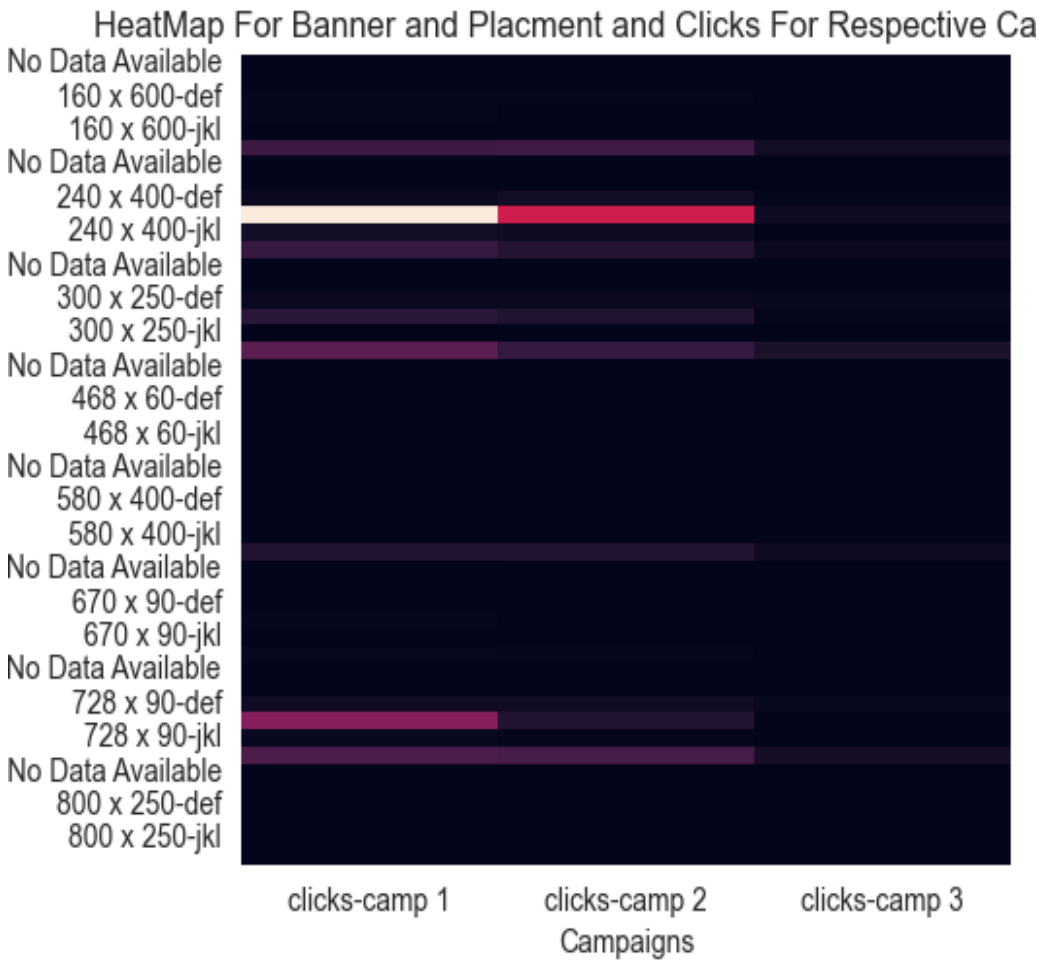
ARE THERE ANY OUTLIERS IN TERMS OF COST, CLICKS, OR REVENUE THAT WARRANT FURTHER INVESTIGATION?



- It is evident from the boxplot for each section that outliers are present in all of them.

- Upon conducting a more detailed analysis, it is determined that the cost section contains 2515 outliers, the clicks section has 2325 outliers, and the revenue section has 2512 outliers, out of a total of 15403 values.

HOW DOES THE EFFECTIVENESS OF CAMPAIGNS VARY BASED ON THE SIZE OF THE AD AND PLACEMENT TYPE?



- While there are various other factors contributing to the determination of the campaign's effectiveness, we have focused our analysis primarily on the number of clicks as a key metric.

- The observation revealed that, considering all campaigns, the combination of 240 x 600 ads under placement "ghi" generated the highest number of clicks.

- Regarding camp 1 and camp 2, the 240 x 600 ad placement under "ghi" combination was the most productive.

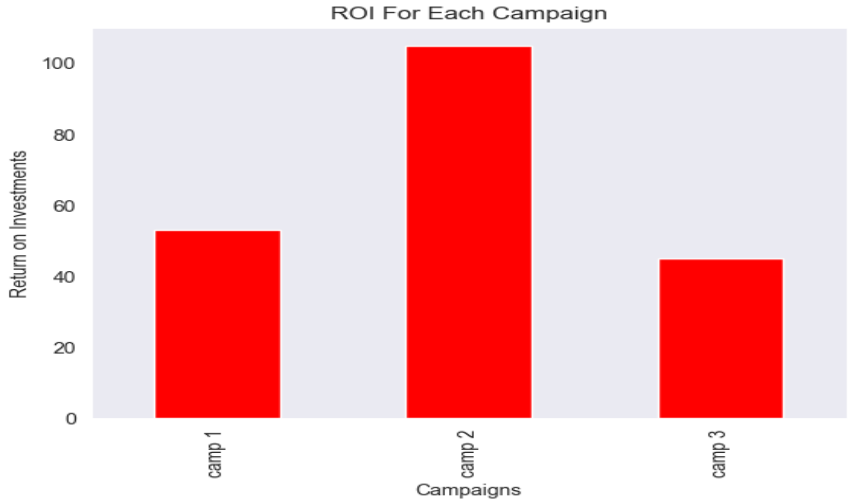
- Camp 3 exhibited minimal deviation across all combinations, consistently yielding clicks within the range of 30000-40000.

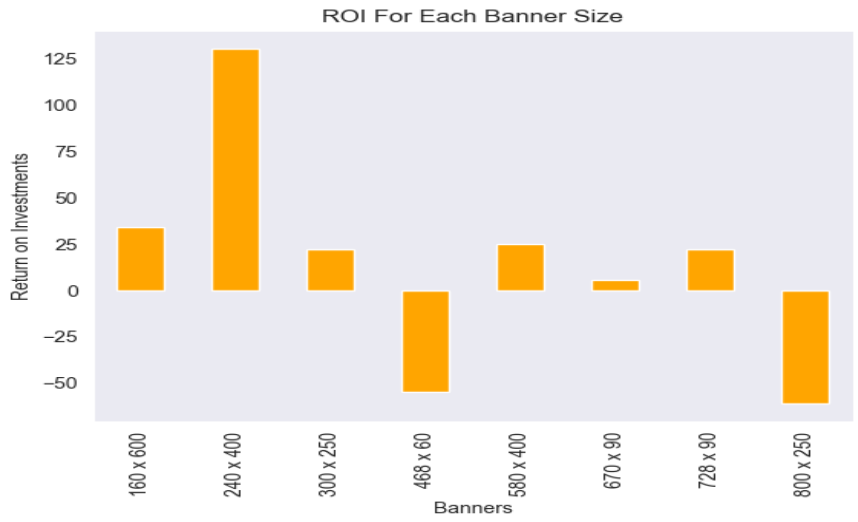
- In the heatmap, darker shades correspond to values closer to 0, while lighter shades indicate values surpassing 500,000.

ARE THERE ANY SPECIFIC CAMPAIGNS OR BANNER SIZES THAT CONSISTENTLY OUTPERFORM OTHERS IN TERMS OF ROI?

- Campaign 2 demonstrates the highest ROI, exceeding 100%, in comparison to Campaign 1, which yields slightly above 50%, followed by Campaign 3 with a 45% ROI.

- The 240 x 400 banner achieves an exceptional ROI of approximately 130%, whereas the 800 x 250 banner yields a considerably unfavorable ROI of -61%.



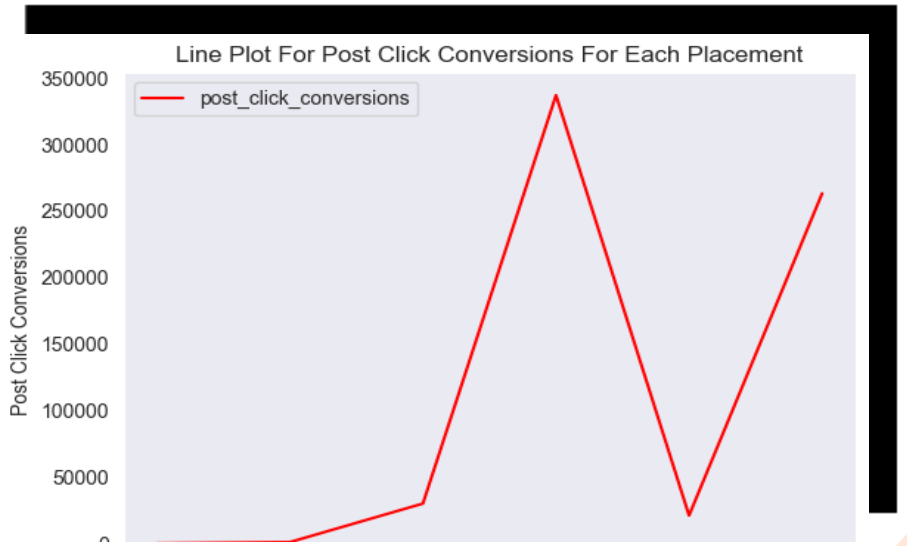


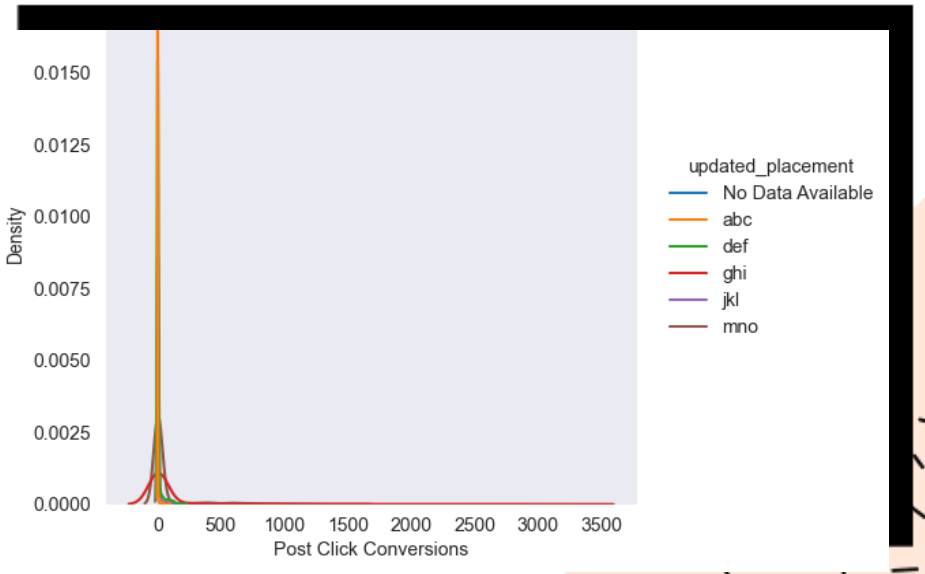
WHAT IS THE DISTRIBUTION OF POST-CLICK CONVERSIONS ACROSS DIFFERENT PLACEMENT TYPES?

- The distribution of post-click conversions across various placements exhibits positive skewness and high kurtosis, both collectively and when examined individually for each placement.

- Outliers are evident within each placement when examined individually.

- Post-click conversions are at their peak for placement "ghi" and at their lowest for placement "abc".



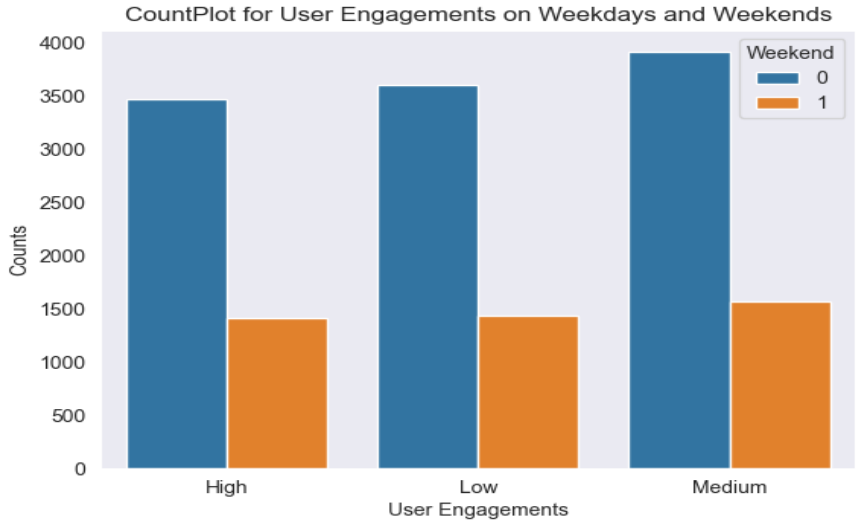


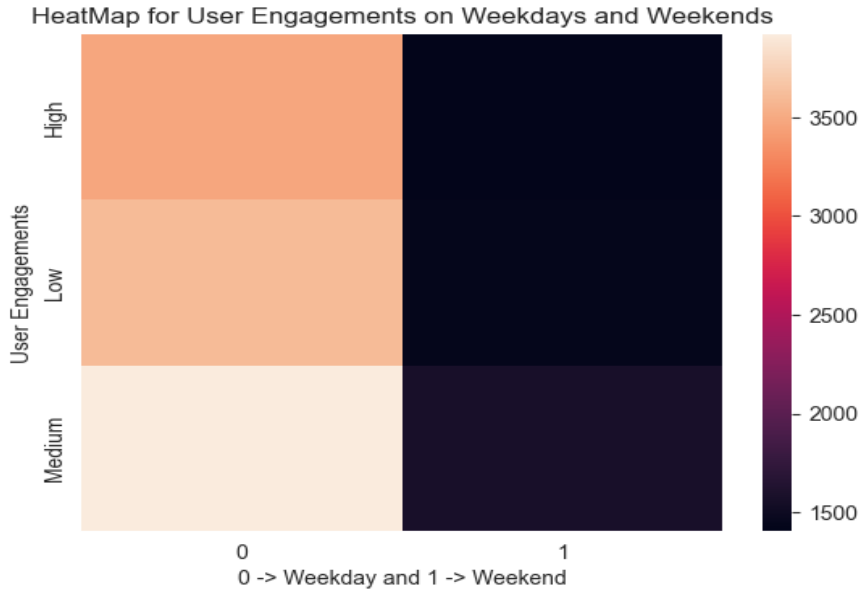
ARE THERE ANY NOTICEABLE DIFFERENCES IN USER ENGAGEMENT LEVELS BETWEEN WEEKDAYS AND WEEKENDS?

- Engagement levels in each category notably peak during weekdays compared to weekends.

- During weekends, user engagement across high, medium, and low sections is observed to be nearly equal.

- On weekdays, medium engagement edges out low engagement, followed by high engagement, with only slight differences.





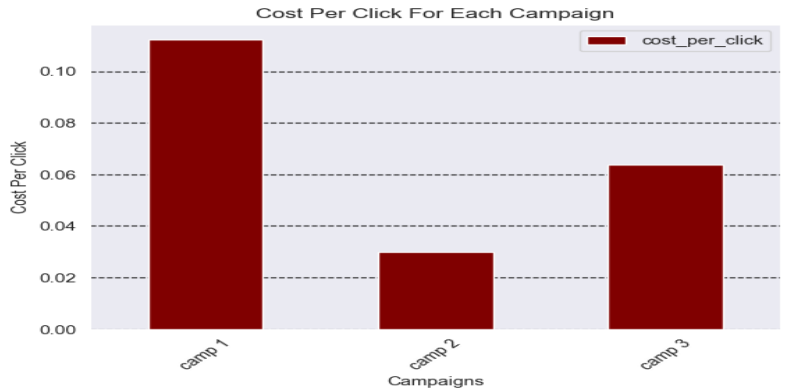
HOW DOES THE COST PER CLICK (CPC) VARY ACROSS DIFFERENT CAMPAIGNS AND BANNER SIZES?

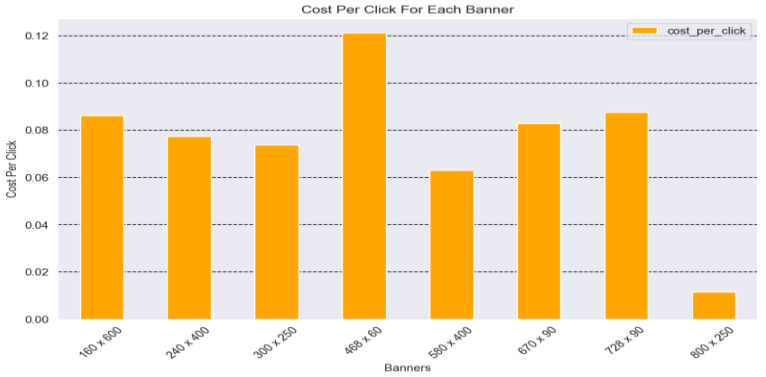
- Camp 1 exhibits the highest mean cost per click, followed by Camp 3 and then Camp 2.

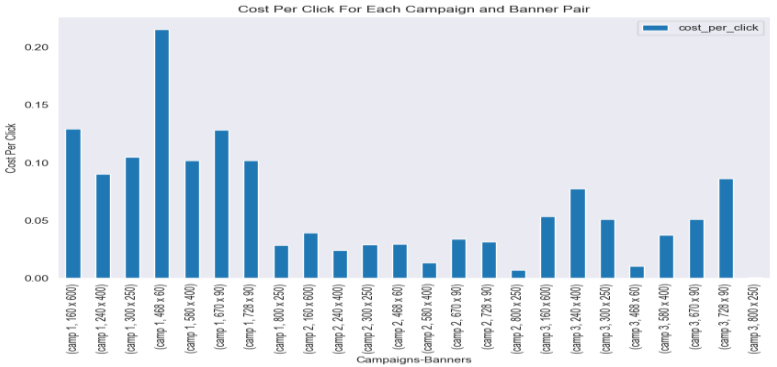
- Hence, Camp 2 boasted the most economical rates, while Camp 1 emerged as the priciest option.

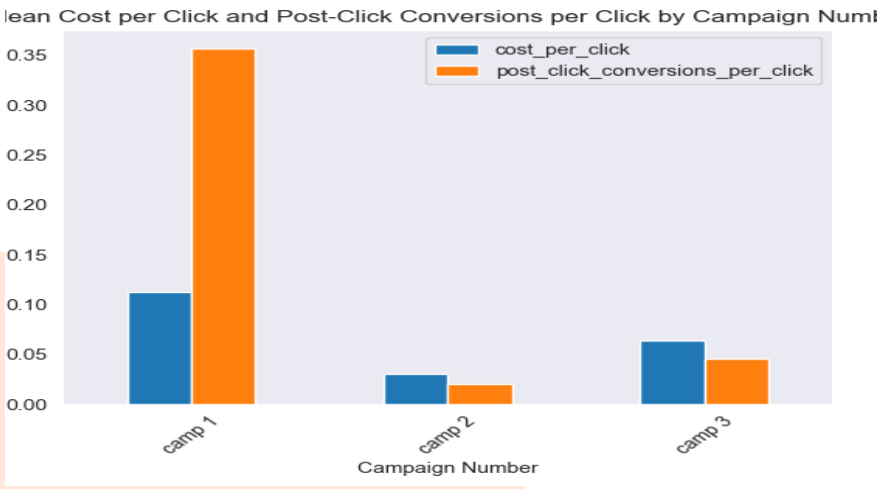
- The 468 x 60 banner size demonstrates the greatest cost per click, followed by the remaining sizes which have nearly identical CPCs. The 800 x 250 size exhibits the lowest CPC.

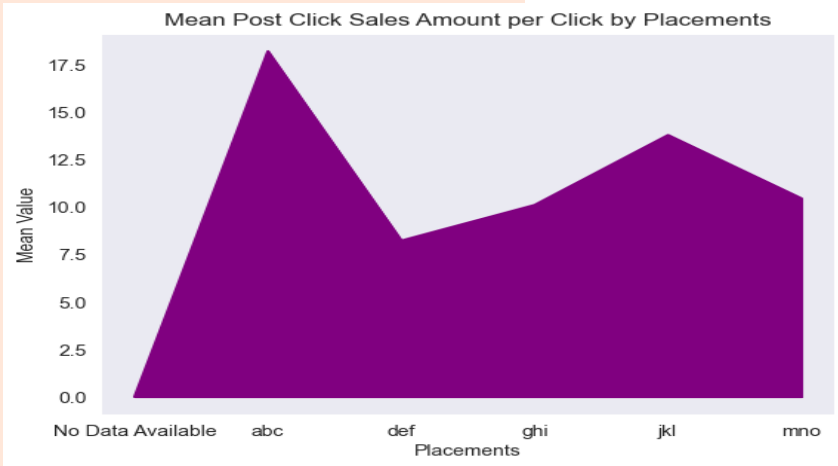
- After analyzing each camp-banner pair, it was observed that the combination of Camp 1 and the 468x60 banner exhibited the highest CPC compared to others, while the combination of Camp 2 and the 800x250 banner had the lowest CPC.











ARE THERE ANY CAMPAIGNS OR PLACEMENTS THAT ARE PARTICULARLY COST-EFFECTIVE IN TERMS OF GENERATING POST-CLICK CONVERSIONS?

- When analyzing on a per-click basis, it is evident that Campaign 1 yields the most favorable post-click conversions.

- Post-click sales are also dominated by Campaign 1, solidifying its position as the most cost-effective option, followed by Campaign 3 and then Campaign 2.

- Placement ABC exhibits the most favorable post-click conversions per click.

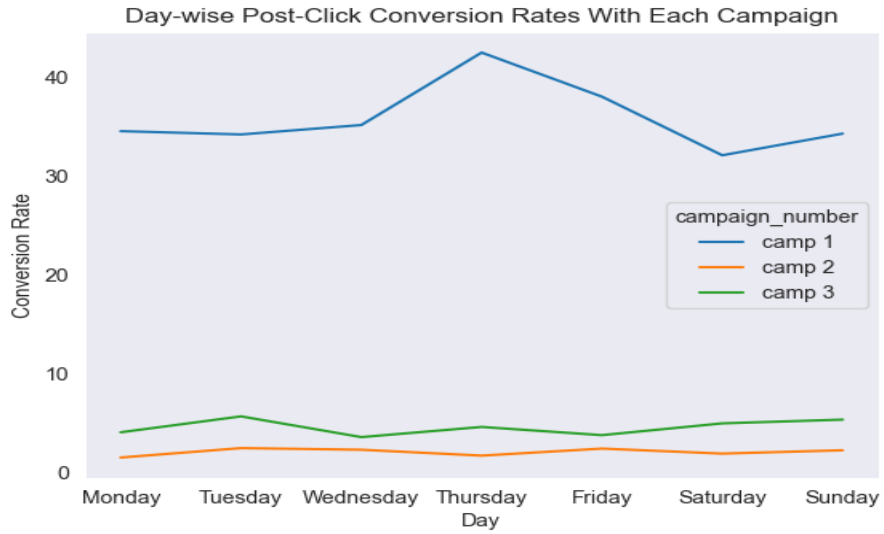
- The per-click sales amount performance is optimal for placement ABC, followed by JKL, and is least for DEF.

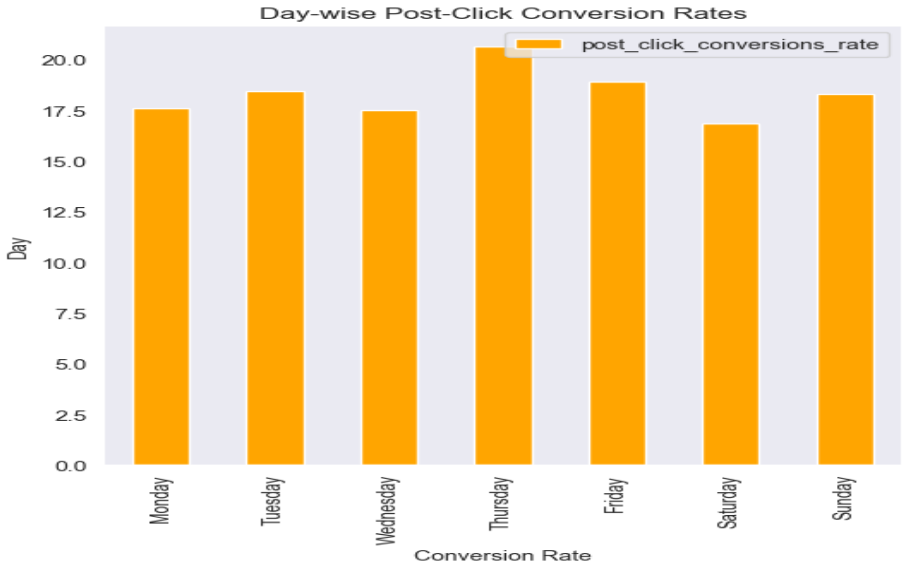
CAN WE IDENTIFY ANY TRENDS OR PATTERNS IN POST-CLICK CONVERSION RATES BASED ON THE DAY OF THE WEEK?

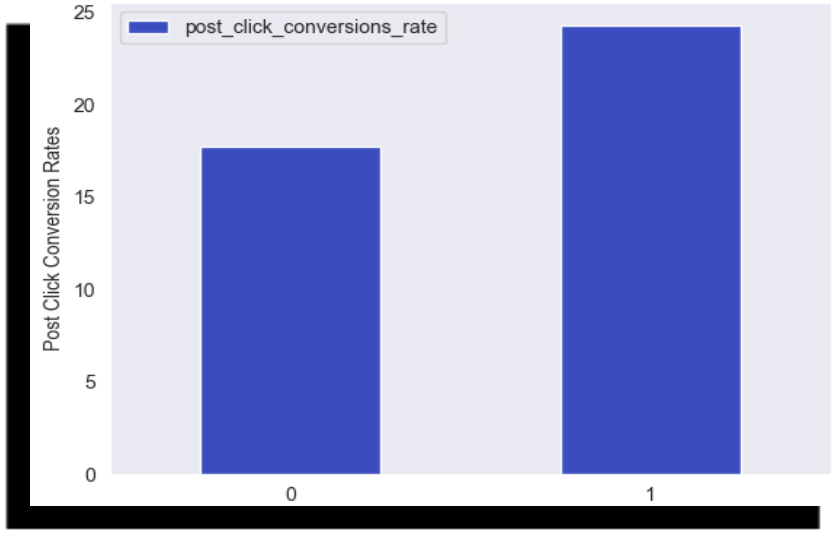
- Post-click conversion rates peak on Thursday, with the other days closely trailing behind.

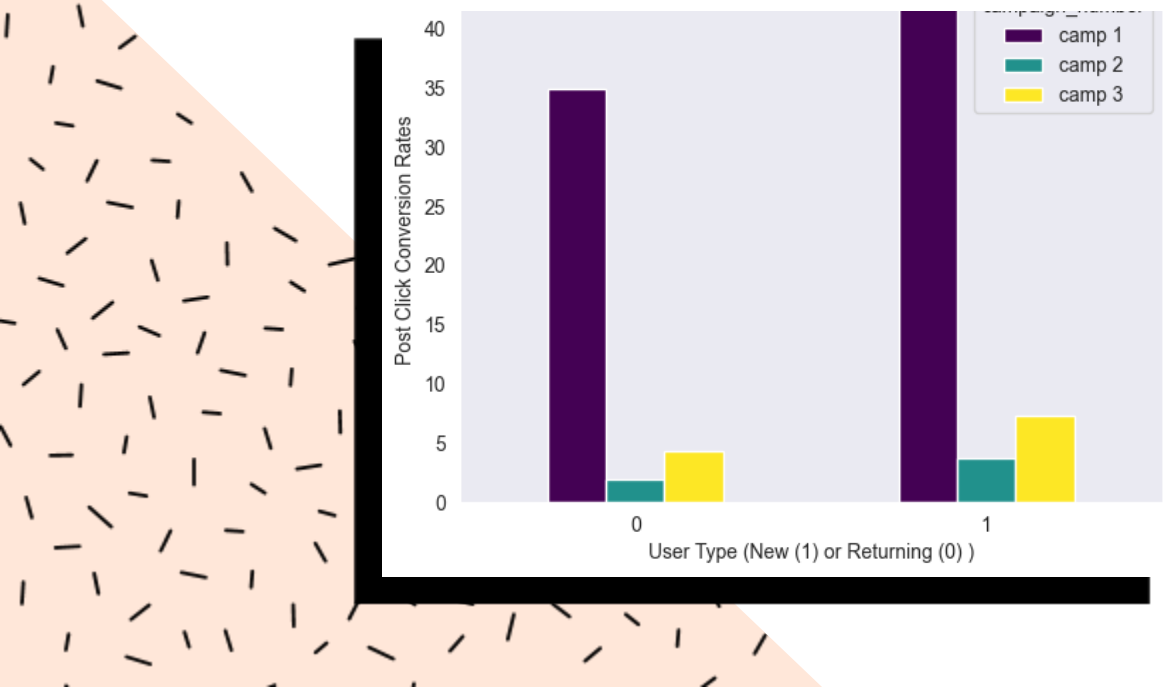
- When analyzed by campaign, it's evident that Campaign 1 boasts the highest conversion rate, followed by Campaign 3 and then Campaign 2.

- For Campaign 1, the highest conversion rates are observed on Thursday. For Campaign 2, they are on Tuesday, and for Campaign 3, also on Tuesday.









HOW DOES THE EFFECTIVENESS OF CAMPAIGNS VARY BETWEEN NEW USERS AND RETURNING USERS IN TERMS OF POST-CLICK CONVERSIONS?

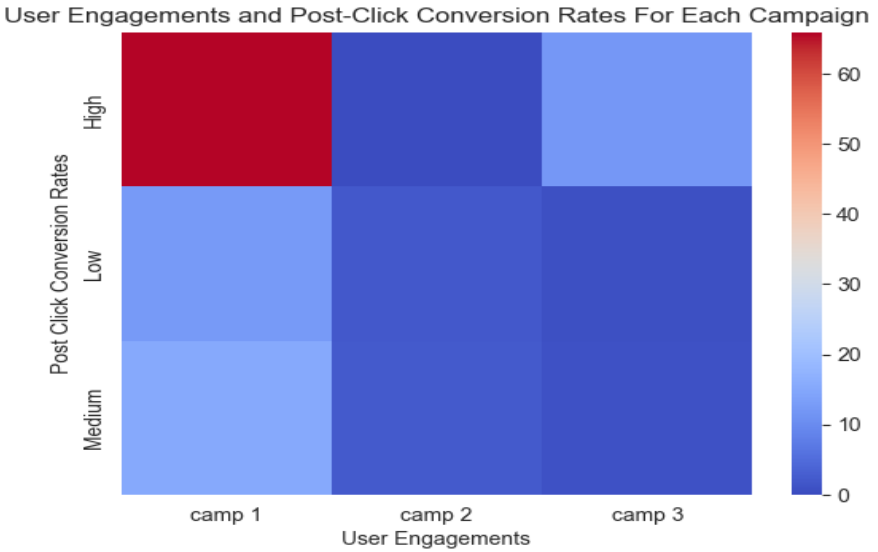
- New users demonstrate superior post-click conversion rates compared to returning users in the analyzed campaigns.

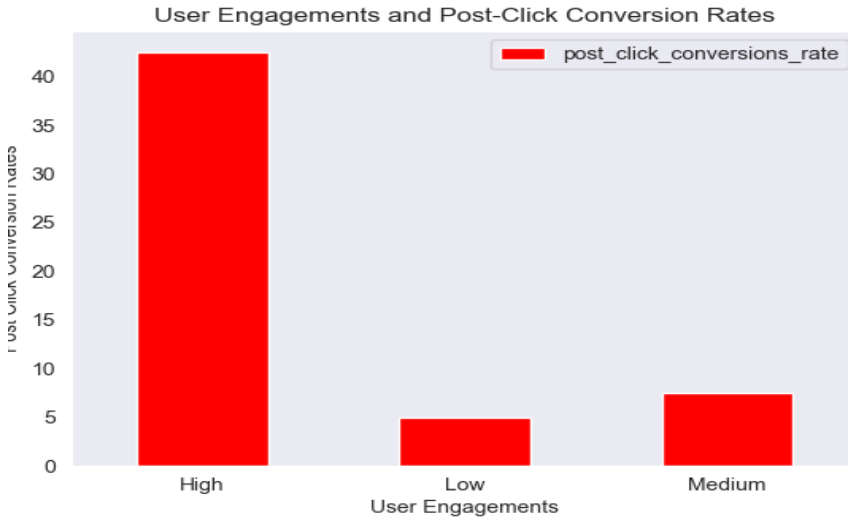
- A consistent trend is observed across all three campaigns, with new users outperforming returning users in terms of post-click conversion rates.

HOW DOES THE EFFECTIVENESS OF CAMPAIGNS VARY THROUGHOUT DIFFERENT USER ENGAGEMENT TYPES IN TERMS OF POST-CLICK CONVERSIONS?

- The post-click conversion rates are significantly higher for users with high engagement compared to those with medium and low engagement, indicating a notable margin between the groups.

- Camp 1 and Camp 3 exhibit high levels of engagement, while Camp 2 is characterized by medium engagement.





THANK YOU