INTRODUCTION

WELCOME TO OUR ANALYSIS OF ADVERTISING CAMPAIGN EFFECTIVENESS. IN THIS PRESENTATION, WE DELVE INTO KEY INSIGHTS DERIVED FROM AN IN-DEPTH EXAMINATION OF OUR ADVERTISING CAMPAIGN DATA. THROUGH RIGOROUS ANALYSIS, WE EXPLORE TRENDS IN USER ENGAGEMENT, THE IMPACT OF AD SIZE AND PLACEMENT, CORRELATIONS BETWEEN COSTS AND REVENUE, AND EFFECTIVENESS METRICS SUCH AS POST-CLICK CONVERSION RATES. BY DISSECTING VARIOUS ASPECTS OF OUR CAMPAIGNS, WE AIM TO UNCOVER ACTIONABLE INSIGHTS TO INFORM FUTURE ADVERTISING STRATEGIES AND OPTIMIZE RETURN ON INVESTMENT. LET'S DIVE INTO THE FINDINGS AND EXPLORE HOW WE CAN ENHANCE THE EFFECTIVENESS OF OUR ADVERTISING EFFORTS.

THE DATASET PROVIDES INSIGHTS INTO THE ONLINE ADVERTISING PERFORMANCE OF A COMPANY, REFERRED TO AS "COMPANY X", FROM APRIL 1, 2020, TO JUNE 30, 2020. THE CURRENCY USED FOR TRANSACTIONS IS THE US DOLLAR.
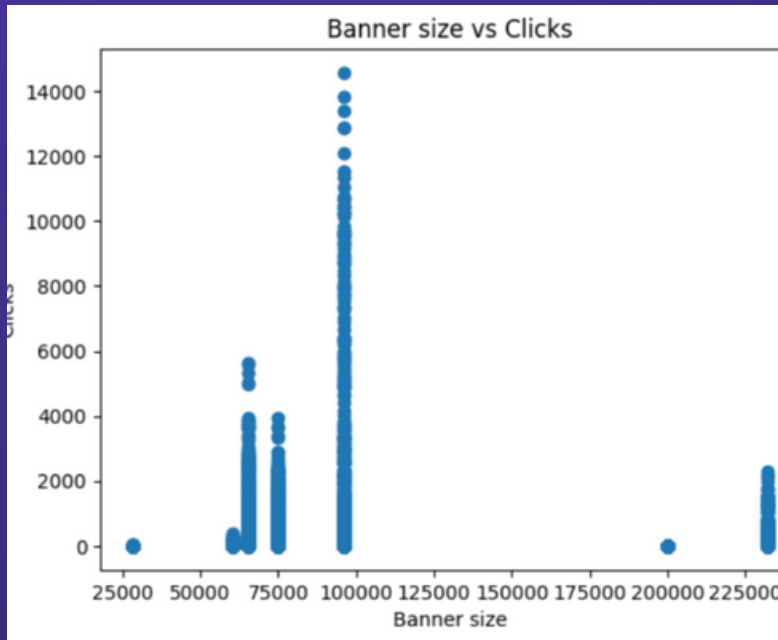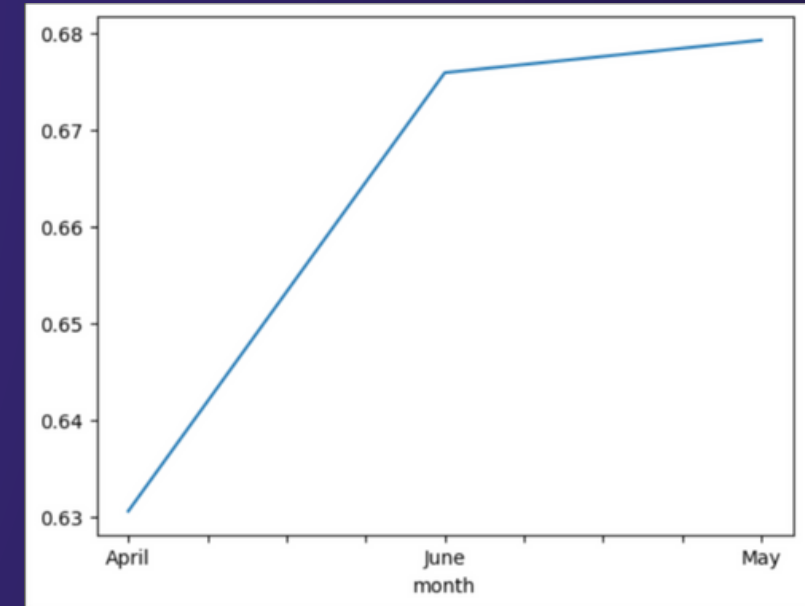
USER ENGAGEMENT OVER THE CAMPAIGN

| DATA SET	MODIFICATION
HIGH	1
MEDIUM	0.5
LOW	0

THE GRAPH REPRESENTS THE AVERAGE USER ENGAGEMENT IN EACH MONTH DURING THE CAMPAIGN

- WE CAN SEE THAT THE USER ENGAGEMENT INCREASED WITH THE CAMPAIGN IN THE FIRST MONTH
- THEN IT PEAKED DURING MAY
- AND WAS HIGH DURING JUNE ALSO WITH A SMALL DIP IN THE AVERAGE USER ENGAGEMENT

IMPACT OF AD SIZE ON CLICKS

- THE GRAPHS SHOW CLICKS DEPENDING UPON THE BANNER AREA AND DIMENSIONS
- IT CAN BE OBSERVED THAT BANNER OF AREA NEAR TO 100000 IS BEST SUITED FOR THR CAMPAIGN
- VERY SMALL OR LARGE BANNERS ARE USUALLY INEFFECTIVE
- ALSO DIFFERENT DIMENSIONS ALSO AFFECT THE PEOPLE'S PSYCHOLOG
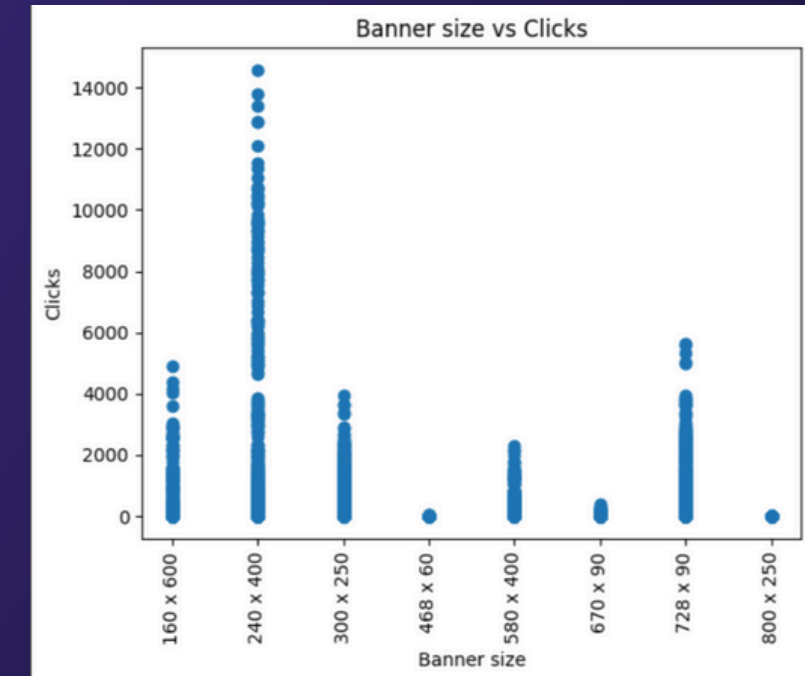
EFFECTIVENESS OF APPS AND WEBSITES

```
Placements with the highest number of displays:
placement
mno     143161775
ghi      59740415
def      28177492
jkl       7692732
abc        242142
```

- CORRELATION COEEFICIENT BETWEEN DISPLAYS AND CLICKS IS QUITE HIGH WITH A VALUE OF 0.7669
- MNO WITH HIGHEST NUMBER OF DISPLYS IS ALMOST AT THE TOP IN GETTING THE MOST CLICKS
- ABC WITH LEAST DISPLAYS HAS RECIEVED THE LEAST CLICKS
- THIS TREND IS BEING FOLLOWED BY ALL TYPES OF PLACEMENTS

THE AVERAGE REVENUE GENERATED PER CLICK IS 0.1108

```
Placements with the highest number of clicks:
placement
ghi      1247049
mno       993039
def       176097
jkl        75063
abc         1584
```

- THE GRAPH DEPICTS A POSITIVE AUTOCORRELATON BETWEEN AD COST AND THE REVENUE GENERATED BY THE AD
- THE CORRELATION COEFFICIENT BETWEEN THE TWO IS 0.7605
- THERE ARE A LOT OF OUTLIERS TOWARDS THE REVENUE > 1000 WHICH WILL SHIFT THE REGRESSION LINE TOWRDS THEM
- IT CAN BE SEEN MORE THE COST AN AD REQUIRES, HIGHER IS THE REVENUE GENERATED

Ad Cost vs Revenue
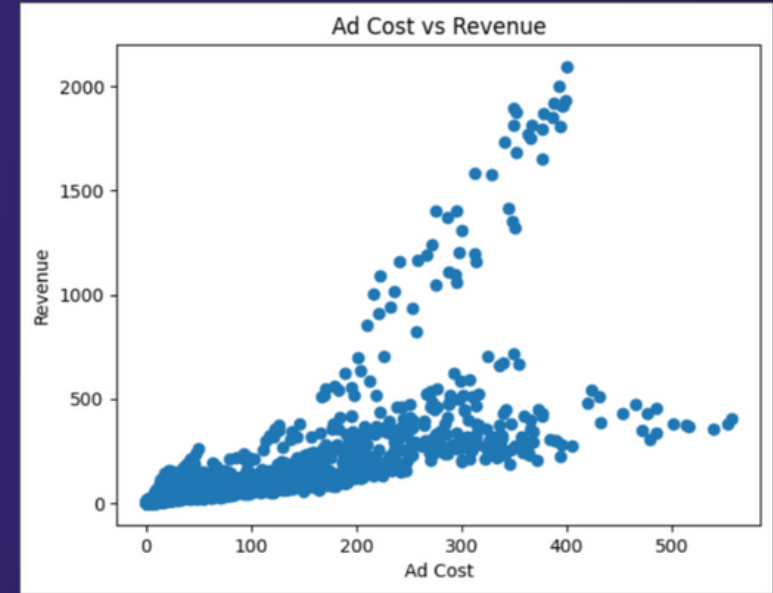
Campaigns with the highest post-click conversion rates in % is campaign 1

```
camp 1     44.927175
camp 2      1.562376
camp 3      2.427139
```


Average Post-Click Sales Amount per Month
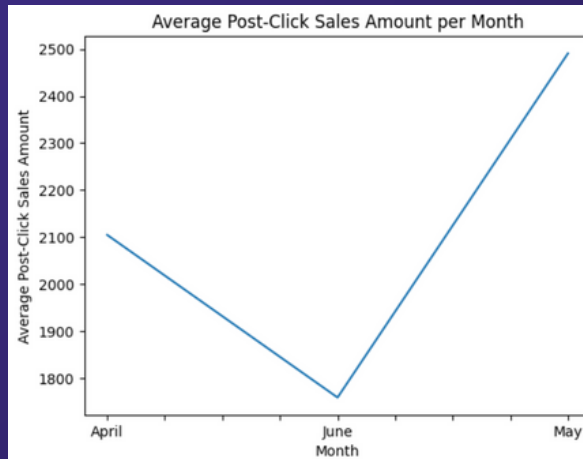
THE AVERAGE POST CLICK SALES INCREASED IN THE INITIAL MONTHS BUT THEN IT DIPPED IN JULY
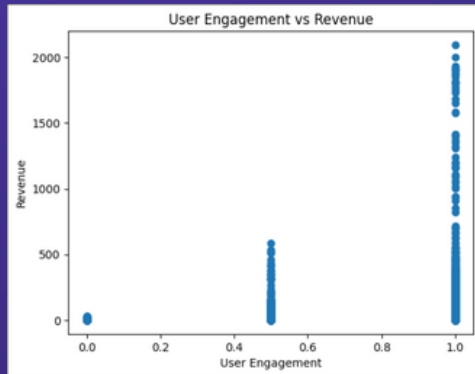
POST CLICK CONVERSIONS

Campaigns with the highest total post-click sales:

```
camp 1     633085
camp 2      13767
camp 3       4916
```

```
camp 1     3.101275e+07
camp 2     1.167509e+06
camp 3     5.353672e+05
```

IMPACT OF AD SIZE ON USER ENGAGEMENT

Average User Engagement by Banner Size

Average Displays

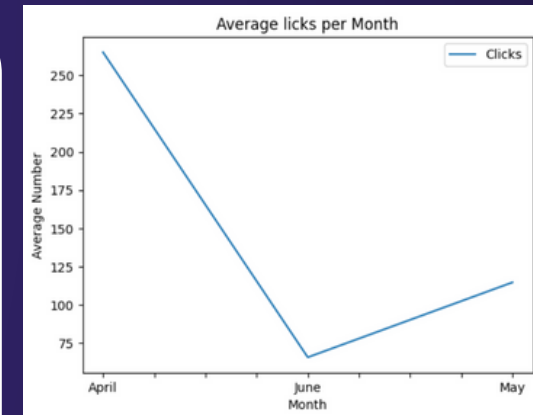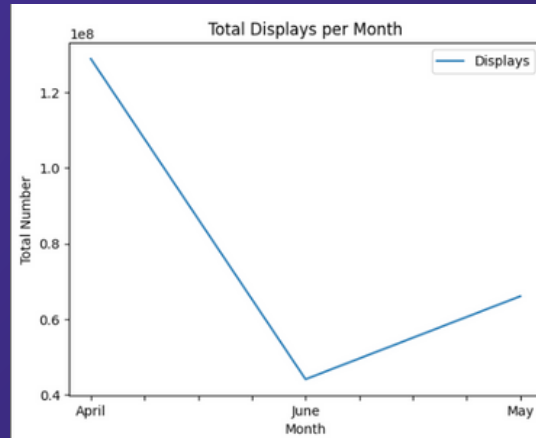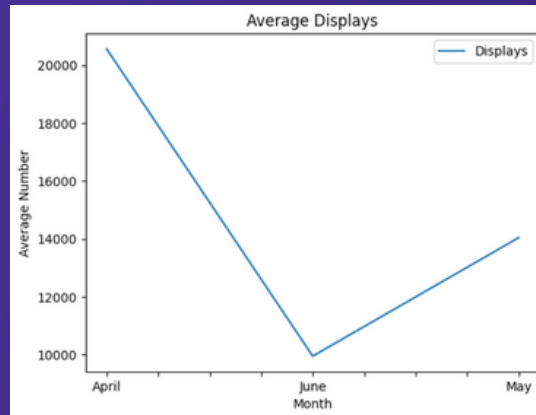Average licks per Month
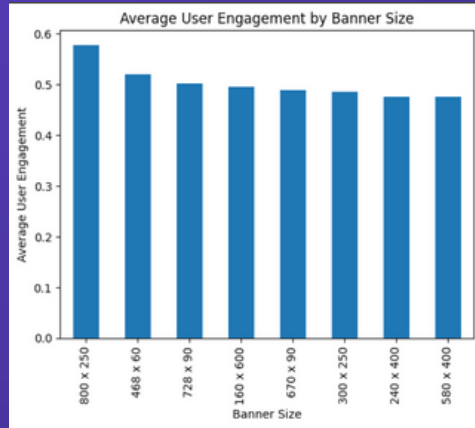
- THE GRAPH DEPICTS THAT THEIR IS NOT MUCH EFFECT OF USER ENGAGEMENT BY BANNER SIZE
- ALL THE BANNER SIZES ARE HAVING APPROXIMATELY THE SAME USER ENGAGEMENT EXCEPT 800X250

- THE GRAPHS DEPICT THAT CAMPAIGN STARTED WITH MUCH HIGHER TOTAL DISPLAYS AND CLICK, WHICH DECLINED AS THE CAMPAIGNS MOVED FURTHER
- THUS THE SAME TREND WAS FOLLOWED IN AVERAGE DISPLAYS AND CLICKS TOO
- ALSO THE TOTALS CLICKS WERE 100 TIMES LESSER THAN THE DISPLAYS DONE DURING THAT MONTH

User Engagement vs Revenue

Total Displays per Month

Total Clicks per Month

- HIGHER THE USER ENGAGEMENT HIGHER THE REVENUE
- IT'S QUITE INTUITIVE TOO

```
Outliers:
          cost      clicks     revenue
3      4.529579    2.243943    3.218805
11     7.506066   13.834314   19.217375
13     9.284113    2.688828    3.832201
26     7.157688    2.581726    3.684543
61     6.203091    4.424432    6.228646
...         ...         ...         ...
15143  3.377398    0.559144    0.465687
15181  4.137737    1.204503    1.013311
15268  4.842527    3.901279    3.307129
15283  3.299105    0.708812    0.600010
15320  4.335618    1.473631    1.250958
```
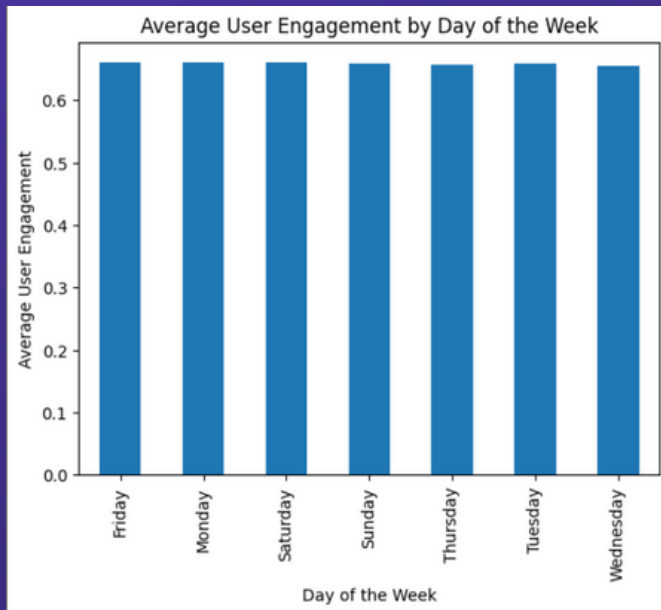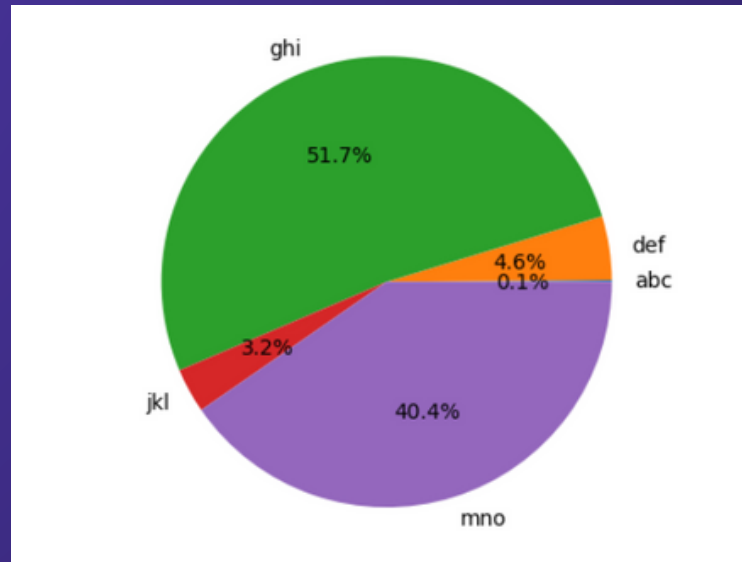
- MANY OUTLIERS HAVE BEEN SPOTTED IN THE GIVEN DATASET
- OUTLIERS INFLUENCE THE ANALYSIS BY DEVIATING THE REGRESSION LINES TOWARDS THEM
- PRESENCE OF OUTLIERS OF LARGE VALUES INFLUENCE THE ANALYSIS IN A MUCH WORSE WAY

- NOT MUCH FLUCTUATION IN THE USER ENGAGEMENT BASED ON WEEKDAYS OR WEEKENDS
- ALTHOUGH ON CLOSE INSPECTION WE CAN SAY THAT FRIDAYS AND SATURDAYS HAD THE HIGHEST USER ENGAGEMENT

TOP 10 HIGHEST AVERAGE ROI

camp 3	160 x 600	4.096757
camp 1	160 x 600	3.931911
camp 2	580 x 400	3.113678
camp 3	580 x 400	3.004255
camp 1	240 x 400	2.531187
	300 x 250	2.171725
	580 x 400	2.070334
camp 2	240 x 400	1.906611
	670 x 90	1.851741
camp 3	670 x 90	1.803126

POST CLICK CONVERSION BY PLACEMENT TYPE

WEEKDAYS-WEEKENDS

Average User Engagement by Day of the Week

- CLEARLY GHI AND MNO DOMINATED IN CONVERSION
- MORE DISPLAYS SHOULD BE DONE ON THESE PLATFORMS

- THE ANALYSIS HAS SHOWN THAT CAMPAIGN 3 WITH THE 160 X 600 BANNER SIZE HAS GIVEN THE HIGHEST ROI
- BEST ROI IS BEING GIVEN BY 160 X 600 BANNERS FOLLOWED BY 580 X 400 BANNERS
- CAMPAIGN 1 HAS DOMINATED IN THE RETURNS PROVIDED
- MORE INVESTMENT CAN BE DONE IN CAMPAIGN 1 AND ALSO IN CAMPAIGN 3'S 160 X 600 BANNER SIZE

| camp 1 | jkl | 3.597787 |
	ghi	3.402816
	def	2.747788
	abc	2.608068
	mno	2.446367
camp 2	def	1.106988
	jkl	1.015020
camp 3	mno	0.632049
	def	0.623884
camp 2	mno	0.623459
	ghi	0.560221
camp 3	ghi	0.410312
	jkl	0.272146
	abc	0.158545
camp 2	abc	0.000000

HIGHEST AVERAGE POST CLICK CONVERSION RATE PER DOLLAR SPENT

- CAMPAIGN 1 HAS USED MORE CONVERSIONS WITH THE SAME AMOUNT SPENT
- FOLLOWED BY CAMPUS 2'S DEF AND JKL PLACEMENT TYPES
- OVERALL WE CAN ALSO SEE THAT DEF IS QUITE AFFORDABLE WITH RESPECT TO CONVERSIONS

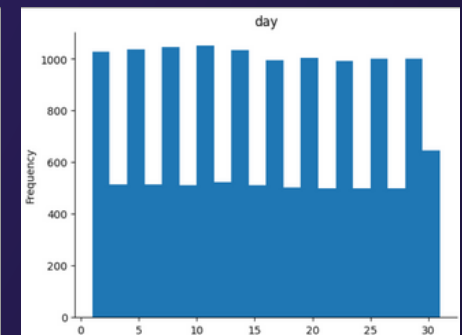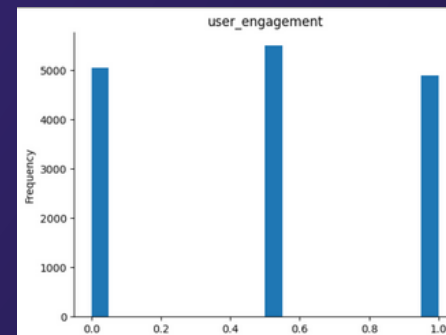| | post_click_conversions | | |
user_engagement	0.0	0.5	1.0
campaign_number			
camp 1	595.0	15249.0	617241.0
camp 2	844.0	12923.0	NaN
camp 3	150.0	1085.0	3681.0

POST CLICK CONVERSION AND USER ENGAGEMENT

- FREQUENCY REMAINED APPROXIMATELY SAME DURING ALL THE DAYS
- MOSTLY THE USER ENGAGEMENT WAS OF MEDIUM LEVEL
- CAMPAIGN 1 SHOWED THE HIGHEST USER ENGAGEMENT BECAUSE OF POST CLICK CONVERSIONS
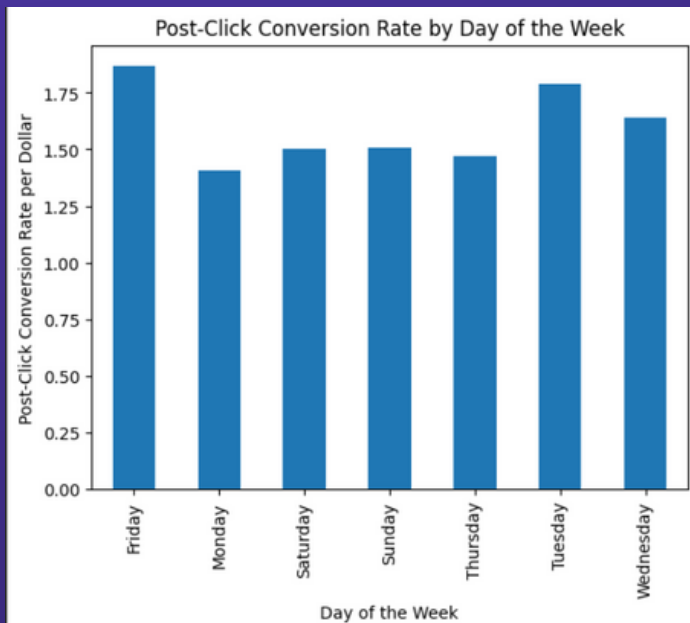
POST CLICK CONVERSION RATE BY THE DAY OF THE WEEK

- DAYS OF THE WEEK AFFECTED THE POST CLICK CONVERSION RATE
- IT'S LOW ON SATURDAYS AND SUNDAYS BUT QUITE HIGH ON FRIDAYS
- ALSO AVG USER ENGAGEMENT WAS THE LEAST ON WEDNESDAY BUT THE CONVERISON RATE IS GOOD ENOUGH

THANK TOU