

# **XYZ Ads Airing Report Analysis**

– By Sagir Mehmood

**Kindly download my notebook:**

[https://colab.research.google.com/drive/1aE3wor0mY8yZxEz4yM8xfMt\\_P9FVn0uI?usp=sharing](https://colab.research.google.com/drive/1aE3wor0mY8yZxEz4yM8xfMt_P9FVn0uI?usp=sharing)

## **Problem Statement:**

### Description:

This dataset having different TV Airing Brands, their product, and their category. The dataset includes the network through which Ads are airing, types of networks like Cable/ Broadcast, and the show name also on which Ads got aired. The dataset includes the data of Dayparts, Time zone, and the time & date at which Ads got aired. It also includes other data like Pod Position (the lesser the valuable), the duration for which Ads aired on screen, Equivalent sales &, and the total amount spent on the Ads aired.

### Objective:

- a. What is Pod Position? Does the Pod position number affect the amount spent on Ads for a specific period by a company?
- b. What is the share of various brands in TV airings and how has it changed from Q1 to Q4 in 2021?
- c. Conduct a competitive analysis for the brands and define the advertisement strategy of different brands and how it differs across the brands.
- d. Mahindra and Mahindra want to run a digital ad campaign to complement its existing TV ads in Q1 of 2022. Based on the data from 2021, suggest a media plan to the CMO of Mahindra and Mahindra. Which audience should they target?

## **Approach:**

Here I am explaining my analysis approach below steps:

**STEP 1:** Data importing and understanding the data 1st, I imported the Dataset ('XYZ\_Ads\_Airings\_Data.xlsx'), then I thoroughly read every column of the dataset.

**STEP 2:** Data cleaning

- i. First, I looked for columns (Date-Time) which are wrongly labeled and corrected them (Timestamp).
- ii. Then, I looked for null values but fortunately, there is no missing data.
- iii. Checked outliers. Here I have used Q1 as the 20th percentile and Q3 as the 80th percentile of the data.
- iv. Added a column named Day\_Time, which indicates the time of the day, such as Early morning, Morning, Afternoon,.. etc.

*Time of the day*

- Morning 5 am to 12 pm
- Afternoon 12 pm to 5 pm
- Evening 5 pm to 9 pm
- Night 9 pm to 12 am
- Mid-Night 12 am to 5 am

- v. Replaced the day number with the proper day name, such as day 1: Monday.
- vi. Replaced the month number with the proper month name, such as month 1: January.

**STEP 3:** EDA

**Tech-Stack Used:** MS Excel & Jupyter Notebook.

## Insights & Result:

### Q1. What is Pod Position? Does the Pod position number affect the amount spent on Ads for a specific period by a company?

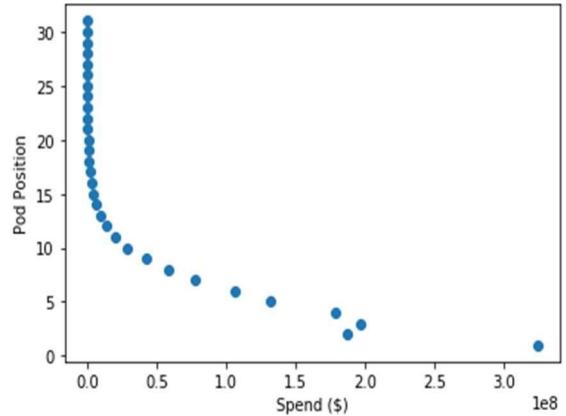
Pod position refers to a certain advertisement's location within a particular commercial pod.

An ad pod is a collection of advertisements that are timed to play consecutively within a single ad break or placement, much like commercial breaks on conventional linear TV. Ad pods provide advertisers more control over ad positioning and give publishers the chance to maximize income from each ad break.

Yes, the Pod position number affects the amount spent on Ads for a specific period by a company. The below images describe the relationship between the grouped pods against the sum of spend. Here We can see that there is a negative correlation between the Pod position and the spending on the advertisement, which means for higher spending pod position is lower.

```
pod=data.groupby("Pod Position").sum()
pod.sort_values(by='Spend ($)', ascending=False)
```

Pod Position	Id	Duration	EQ Units	Spend (\$)	Broadcast Week	Hour Of Day
1	219791426071	4400650	146700.94	324025029	3988739	1952381
3	138105734515	2718835	90638.03	196432582	2457927	1279669
2	152990651803	3040565	101358.69	187654622	2713447	1398589
4	115124270536	2249070	74977.98	178545699	2051333	1078711
5	92113750920	1786135	59545.62	132148569	1640883	865813
6	74922982851	1446720	48230.29	105981319	1328945	707755
7	58800935594	1131085	37707.73	77255099	1046037	557359
8	45536311410	872285	29080.24	58205928	812534	436211
9	33136810433	632965	21102.00	41909147	589604	318295
10	22819056546	435290	14511.79	28706471	408149	221586



But in general, there is a very low negative correlation between the Pod position and the spending.

```
: data['Pod Position'].corr(data['Spend ($)'])
: -0.005715704123710858
```

But for a particular time-period, that is during the October month's weekend show during the Afternoon and evening (Time between 12 am to 9 pm) has the highest correlation between the Pod position and the spending.

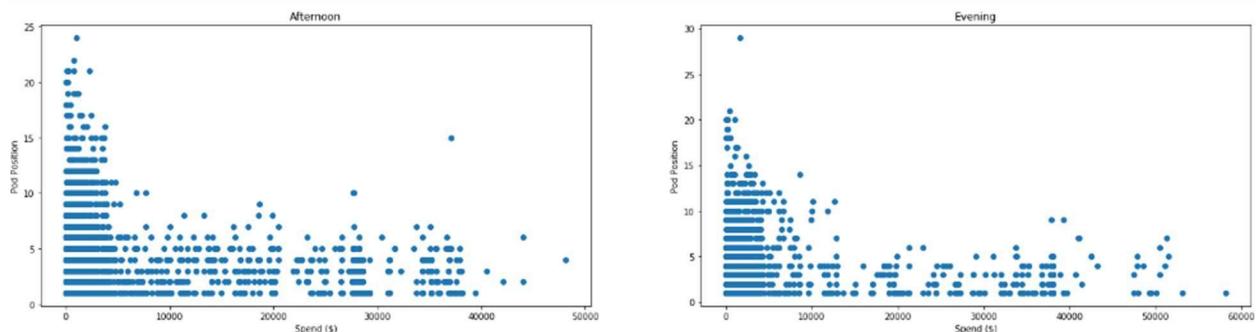
```
: for i in enumerate(daytt):
    spend_pod = pst4.loc[(pst4['Day_Time']==i[1]),['Spend ($)', 'Pod Position']]
    print(i[1],spend_pod['Pod Position'].corr(spend_pod['Spend ($)']))
```

Afternoon -0.1280398543083124  
Evening -0.12761166319531705

*Q4 -> Oct -> Weekend -> 12pm-9pm*

#### *Time of the day*

- Morning 5 am to 12 pm
- Afternoon 12 pm to 5 pm
- Evening 5 pm to 9 pm
- Night 9 pm to 12 am
- Mid-Night 12 am to 5 am



In India, Q4 is a festival season (Durga Puja, Diwali, Bhaiphota...etc), at this time people get more free time to watch TV/Shows, also during the festival time people love to spend.

## Q2. What is the share of various brands in TV airings and how has it changed from Q1 to Q4 in 2021?

### Number of Advertisements:

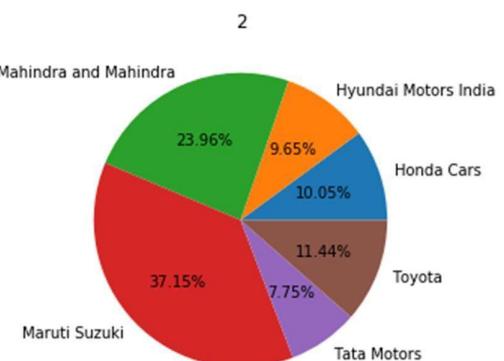
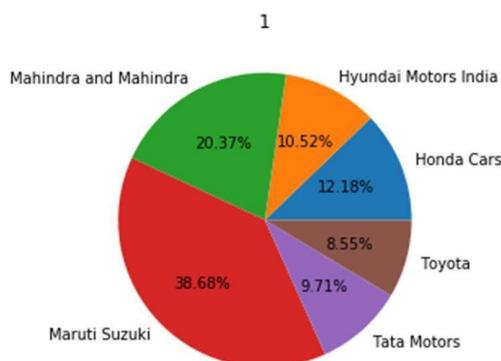
The below tables show the total (And %) number of advertisements ran by each brand during each quarter:

Brand	Total Adv			
	Q1-Total	Q2-Total	Q3-Total	Q4-Total
Honda Cars	25929	19388	23020	16928
Hyundai Motors India	22396	18623	16484	13793
Mahindra and Mahindra	43371	46244	39537	18738
Maruti Suzuki	82381	71695	66196	60002
Tata Motors	20679	14967	14912	30483
Toyota	18212	22083	19678	6045

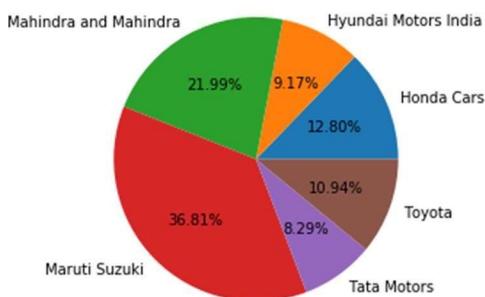
Brand	% Total Adv			
	Q1-Total	Q2-Total	Q3-Total	Q4-Total
Honda Cars	12.18	10.05	12.80	11.60
Hyundai Motors India	10.52	9.65	9.17	9.45
Mahindra and Mahindra	20.37	23.96	21.99	12.84
Maruti Suzuki	38.68	37.15	36.81	41.10
Tata Motors	9.71	7.75	8.29	20.88
Toyota	8.55	11.44	10.94	4.14

### Visualizations:

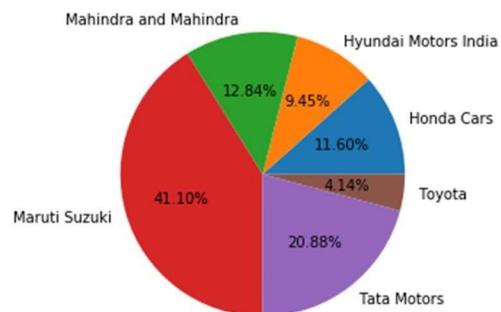
The below images show the total number (%) of advertisements ran in each quarter ran by each brand:



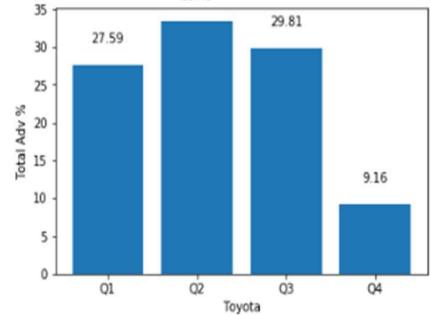
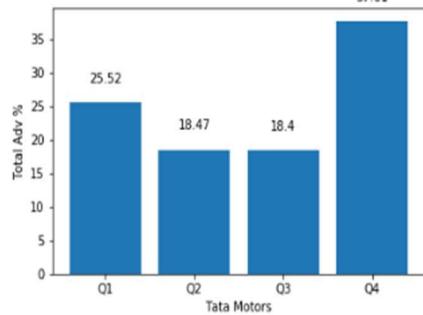
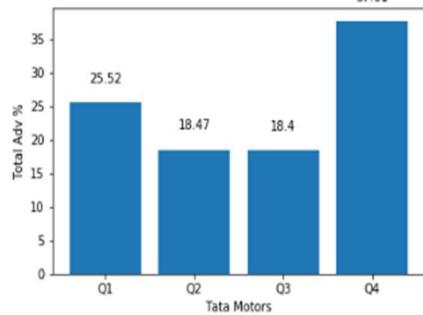
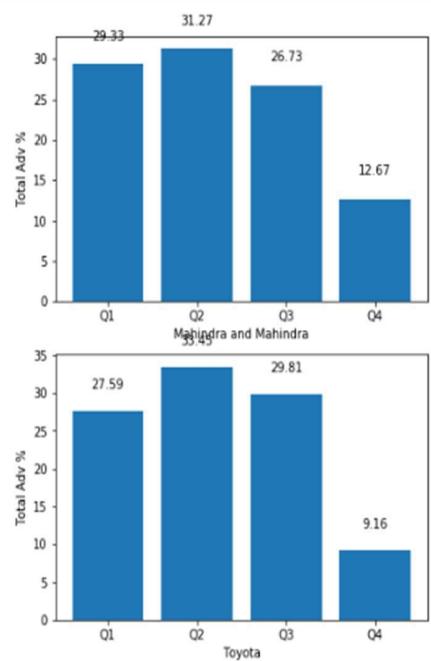
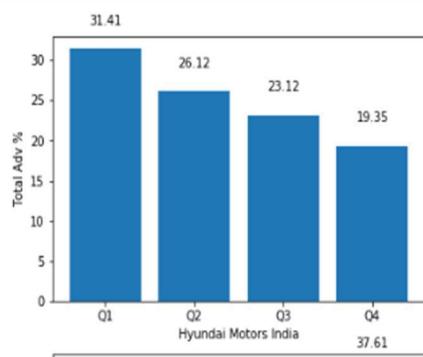
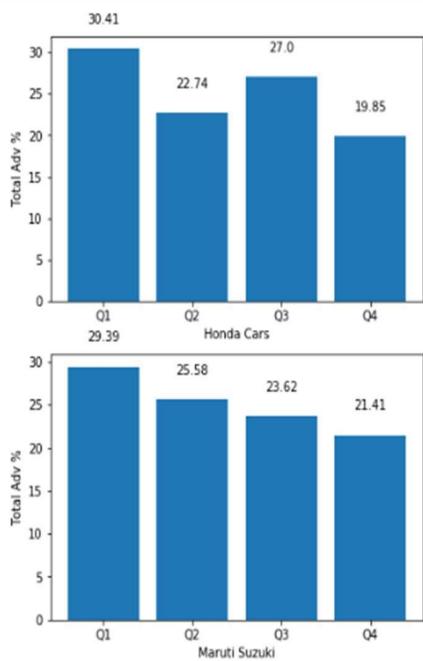
3



4



The below image shows the total number of (%) advertisements ran by each brand during each quarter



We can see that after every quarter the number of advertisements either decreased or increased, the below table shows how much (In percentage %) it changed over the quarters. (**Formula for Q1-Q2:**  $100*(Q2-Q1)/Q1$ )

Brand	Q1-Q2	Q2-Q3	Q3-Q4	Q1-Q4
Honda Cars	-25.23	18.73	-26.46	-34.71
Hyundai Motors India	-16.85	-11.49	-16.32	-38.41
Mahindra and Mahindra	6.62	-14.50	-52.61	-56.80
Maruti Suzuki	-12.97	-7.67	-9.36	-27.17
Tata Motors	-27.62	-0.37	104.42	47.41
Toyota	21.26	-10.89	-69.28	-66.81

### Spending on Advertisements:

The below table shows the total spending on advertisements by each brand during each quarter:

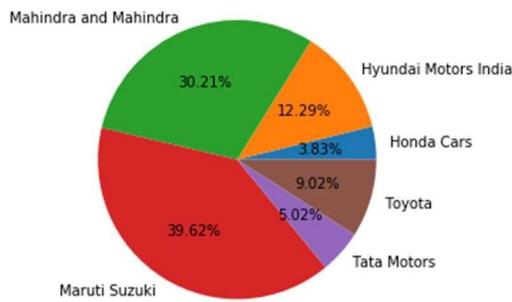
Brand	Total Spend (\$)				% Total Spend (\$)			
	Q1-Total	Q2-Total	Q3-Total	Q4-Total	Q1-Total	Q2-Total	Q3-Total	Q4-Total
Honda Cars	16963778	9549604	12073060	9671898	3.71	2.94	3.83	3.28
Hyundai Motors India	62470842	40830200	38727107	38780607	13.65	12.56	12.29	13.17
Mahindra and Mahindra	129215380	99500908	95196781	73392586	28.22	30.61	30.21	24.92
Maruti Suzuki	183019481	129229242	124833119	121564630	39.98	39.76	39.62	41.27
Tata Motors	25796631	16408174	15831865	36753557	5.63	5.05	5.02	12.48
Toyota	40351398	29509857	28424768	14367089	8.81	9.08	9.02	4.88

### Visualizations:

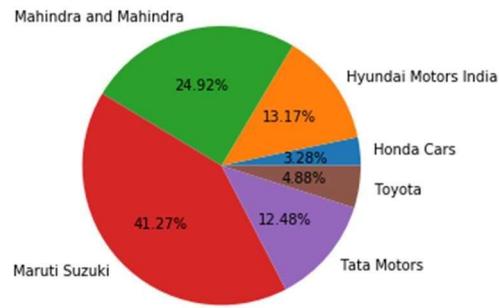
The below image shows the total (%) spending on advertisements in each quarter by each brand:



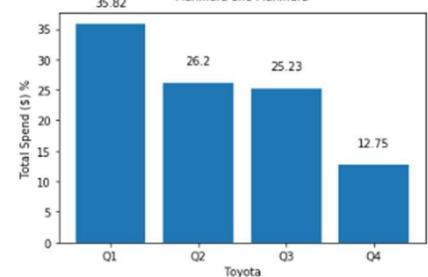
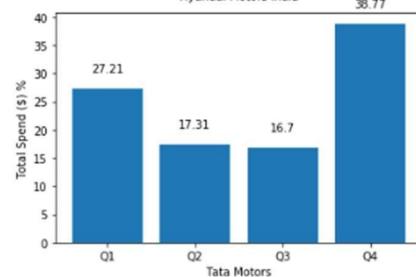
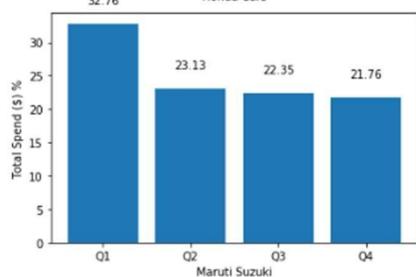
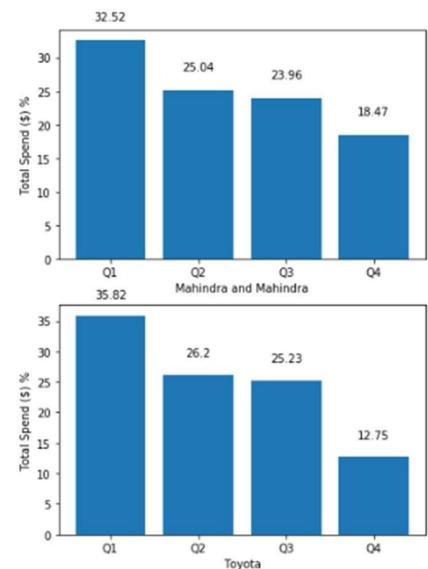
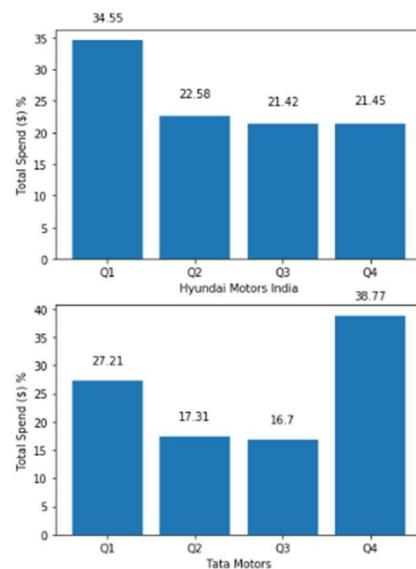
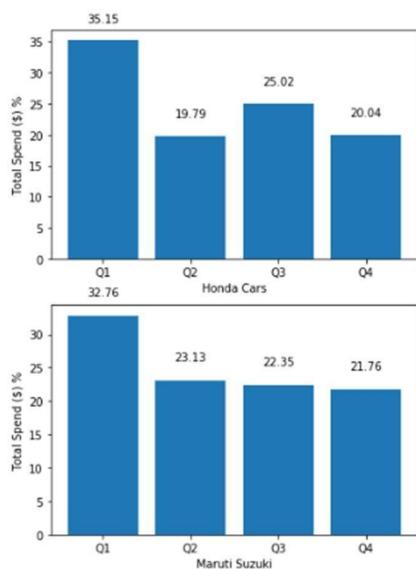
3



4



The below image shows the total % share of spending on advertisements by each brand during each quarter



We can see that after every quarter the spending on advertisements either decreased or increased, the below table shows how much (In percentage %) it changed over the quarters. (**Formula for Q1-Q2:**  $100*(Q2-Q1)/Q1$ )

Brand	Q1-Q2	Q2-Q3	Q3-Q4	Q1-Q4
Honda Cars	-43.71	26.42	-19.89	-42.99
Hyundai Motors India	-34.64	-5.15	0.14	-37.92
Mahindra and Mahindra	-23.00	-4.33	-22.90	-43.20
Maruti Suzuki	-29.39	-3.40	-2.62	-33.58
Tata Motors	-36.39	-3.51	132.15	42.47
Toyota	-26.87	-3.68	-49.46	-64.40

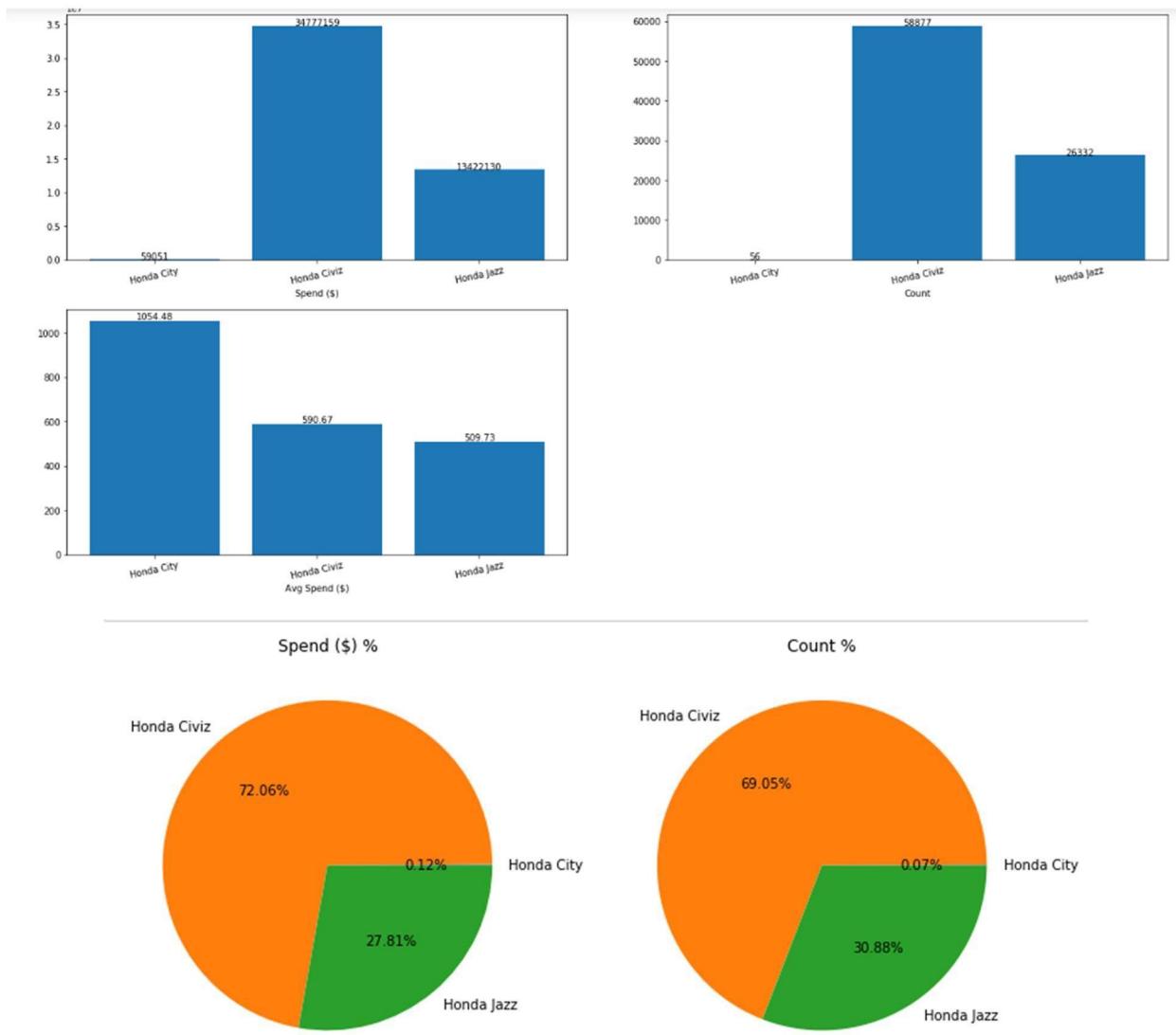
**Q3. Conduct a competitive analysis for the brands and define the advertisement strategy of different brands and how it differs across the brands.**

### Summary:

Brand	Spend (\$)	Count	Avg Spend (\$)	Max Spend (\$)	Min Spend (\$)
Honda Cars	48258340	85265	565.98	72902	0
Hyundai Motors India	180808756	71296	2536.03	5500000	0
Mahindra and Mahindra	397305655	147890	2686.49	103048	0
Maruti Suzuki	558646472	280274	1993.22	91596	0
Tata Motors	94790227	81041	1169.66	83935	0
Toyota	112653112	66018	1706.40	92140	0

## Honda Cars:

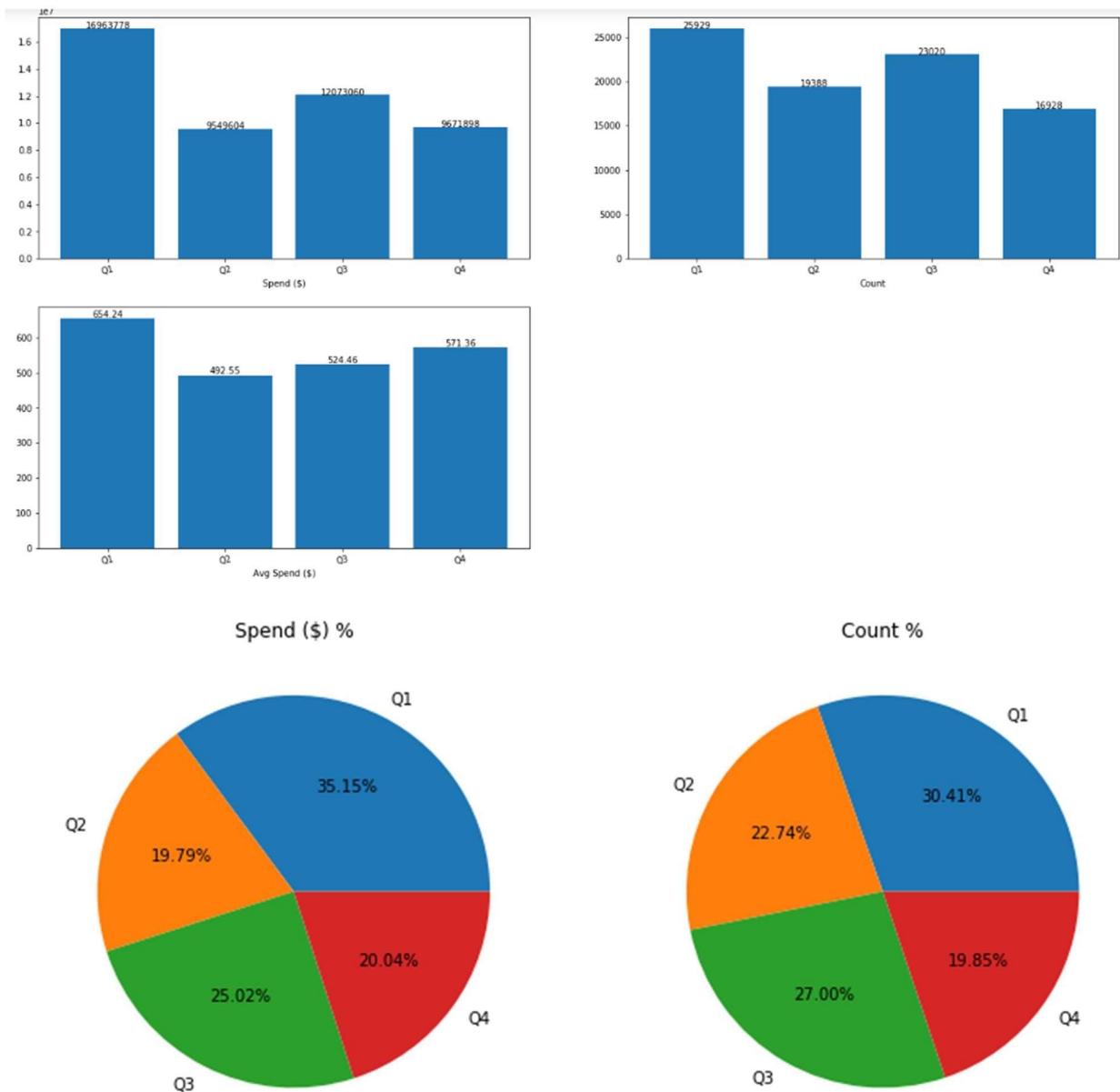
Products:



- Honda Cars have 3 products, they are 'Honda Jazz', 'Honda Civiz', 'Honda City'
- 2 times Honda car advertisements were at Pod position 1 without spending a single penny.
- Honda cars spend most on promoting the Honda Civiz, on 18-07-2021 at the Overnight show.

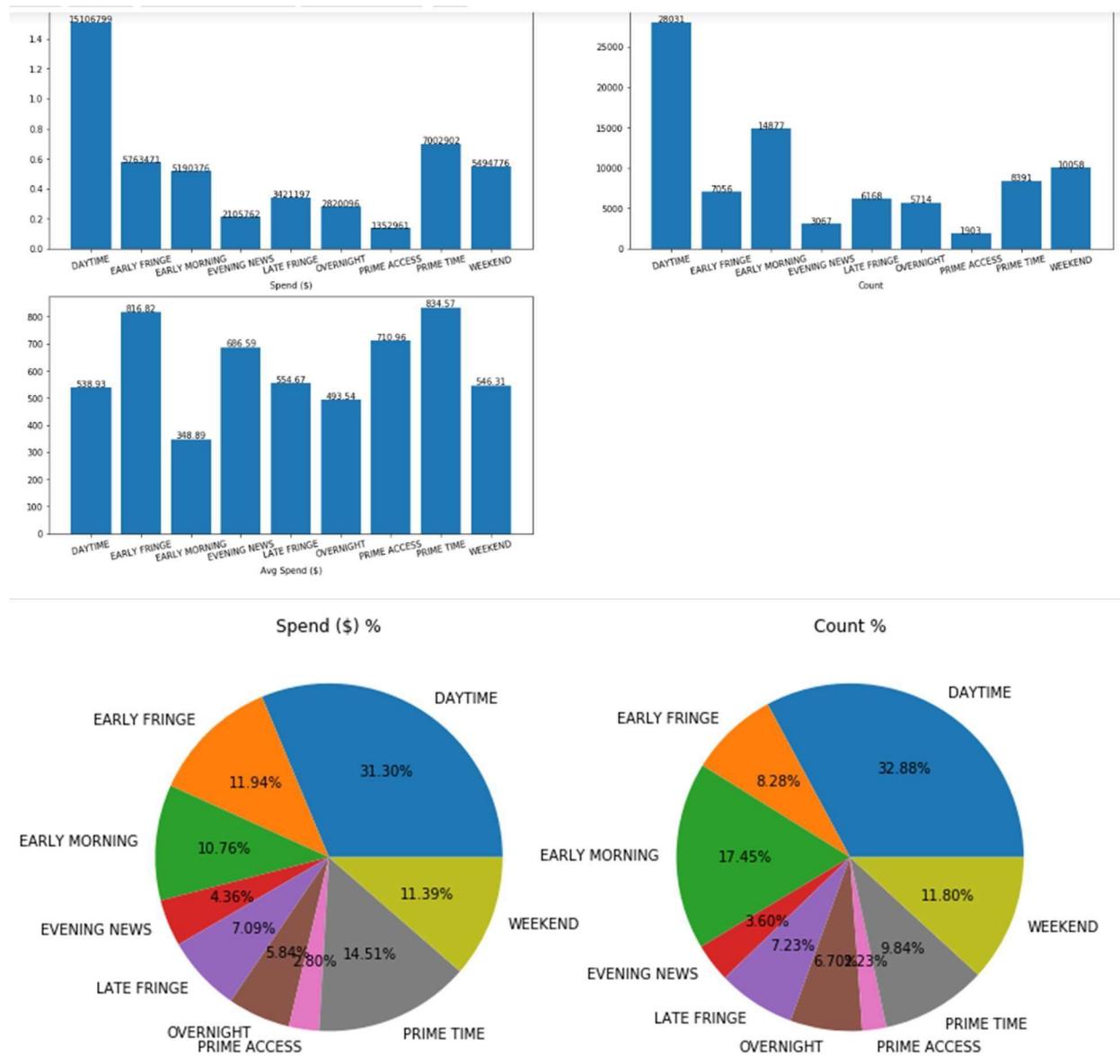
- Out of the total advertisements ran by the Honda cars brand, nearly 70% of ads were for the promotion of the Honda Civiz, also out of the total budget 72% was spent on this product.
- Though the brand ran only 56 ads for the promotion of Honda City, the average spend per ad is 1054, which is the highest among other products.

Quarters:



- During Q1, Honda Car ran the most ads, and also spend the most money on ads.
- After Q1, the budget for the Advs was reduced.

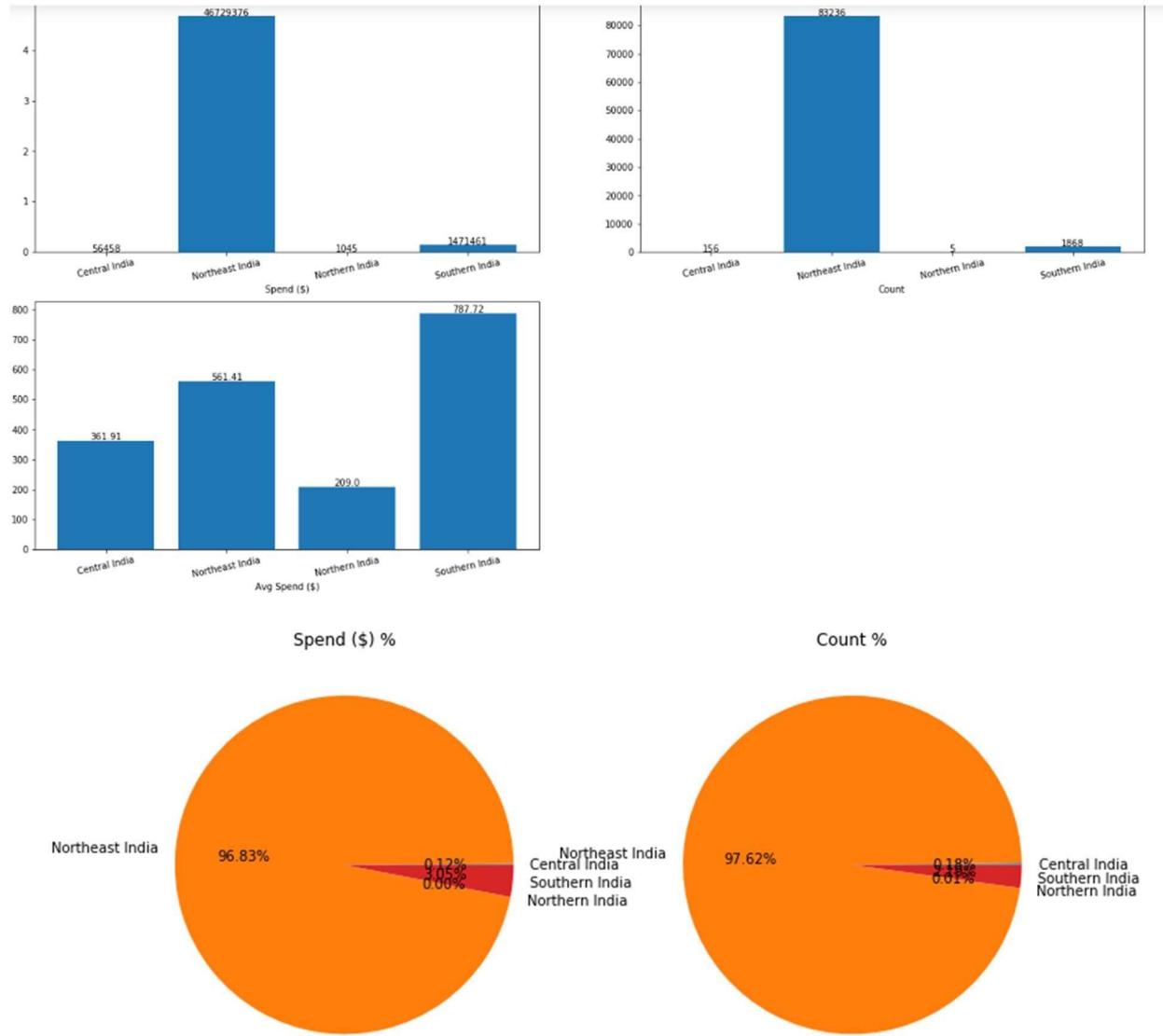
### Dayparts:



- Honda cars prefer to run its ads during the Daytime, Weekend, Primetime, and Early-morning shows.

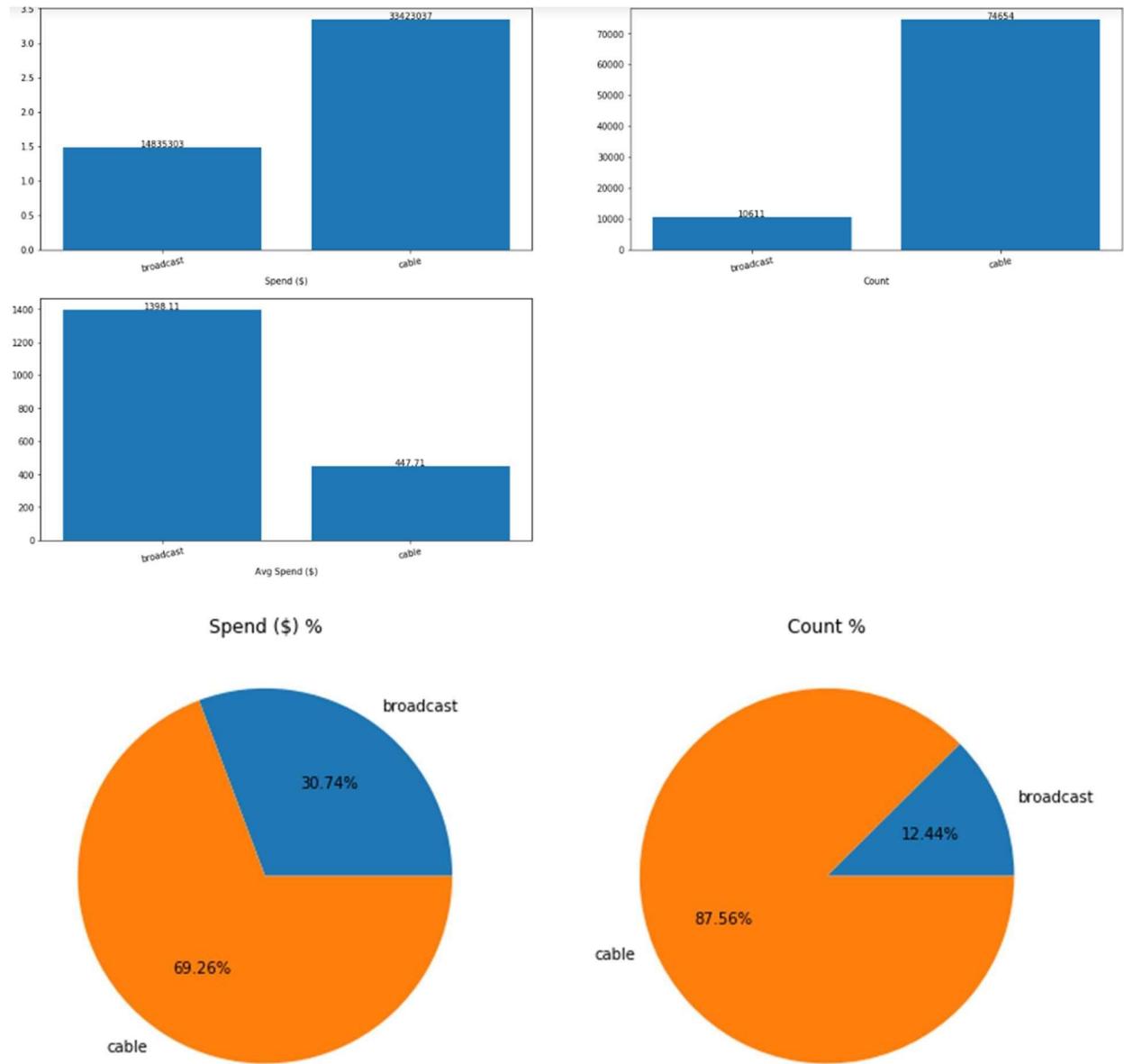
- For the Daytime show, Honda cars spend 31.30% of its budget, and for the weekend show 11.39%, for the primetime show 14.51% & for the early-fringe show 11.94%.

#### Timezone:



- More than 95% of the Ads were run on the Northeast India timezone, also 97% of the budget was allocated for this timezone.
- The average spends on Ads in the Southern India timezone is higher than in other timezones.

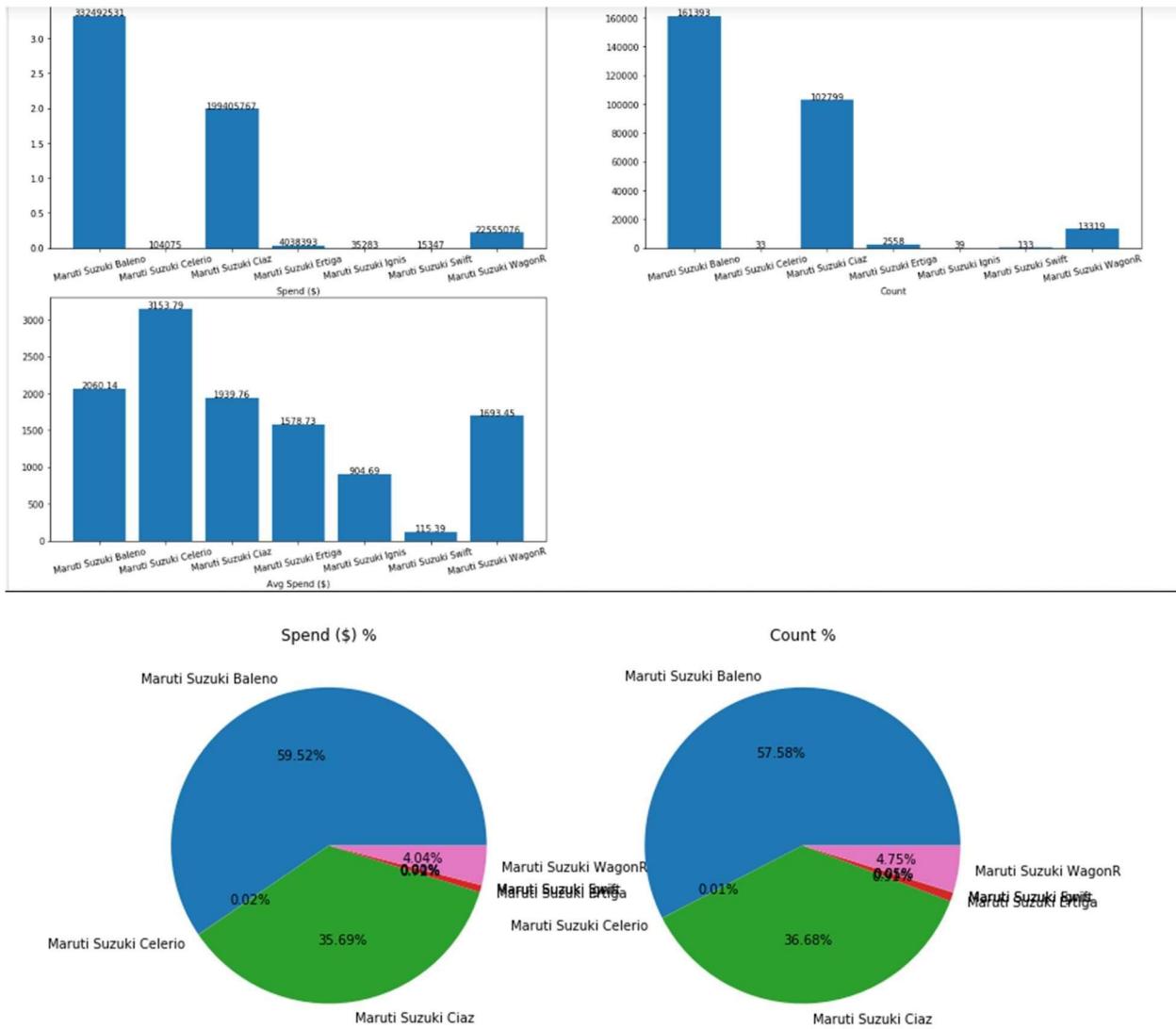
## Network:



- 88% of the Advs were run on the Cable network, and 70% of the budget was allocated for this network.
- The average spending on the Broadcast network is higher than on the cable network.

## Maruti Suzuki:

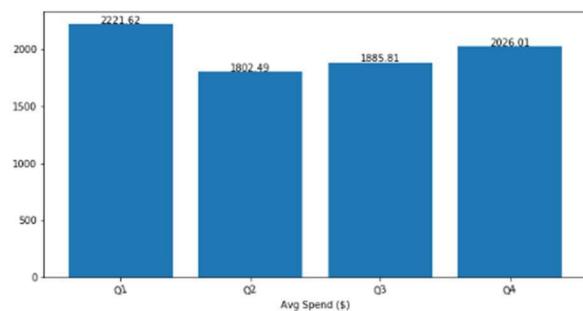
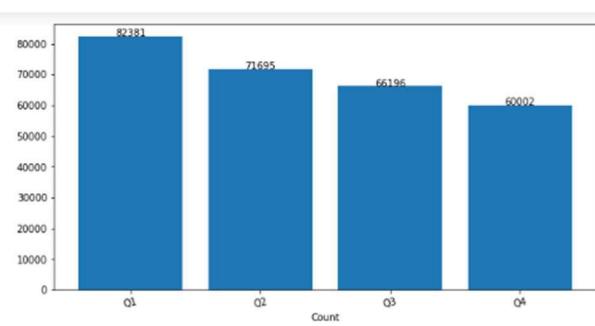
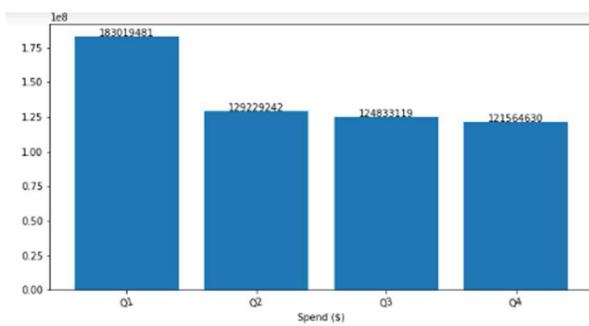
Products:



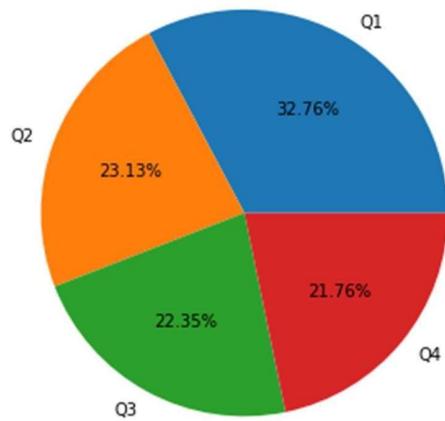
- Maruti Suzuki has 7 products, they are 'Maruti Suzuki Baleno', 'Maruti Suzuki Ciaz', 'Maruti Suzuki WagonR', 'Maruti Suzuki Ertiga', 'Maruti Suzuki Swift', 'Maruti Suzuki Ignis', 'Maruti Suzuki Celerio'
- 282 times Maruti Suzuki's advertisements were at Pod position 1 without spending a single penny.
- Maruti Suzuki spend most on promoting the Maruti Suzuki Baleno, on 07-12-2021 at the PRIME TIME show.

- Out of the total advertisements ran by the Maruti Suzuki brand, nearly 58% of Advs were for the promotion of Baleno, and out of the total budget 60 were spent for this product.
- Out of the total advertisements ran by the Maruti Suzuki brand, 37% of Advs were for the promotion of Ciaz, and out of the total budget 36% was spent on this product.
- The brand ran only 33 ads for the promotion of Celerio.

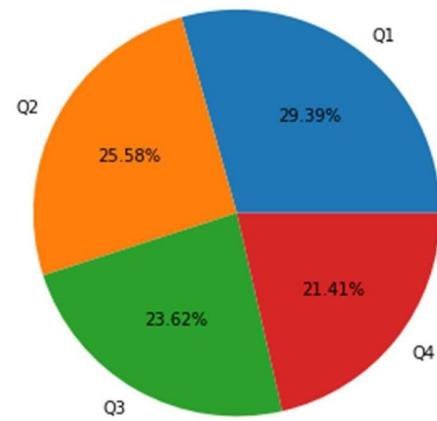
Quarters:



Spend (\$) %

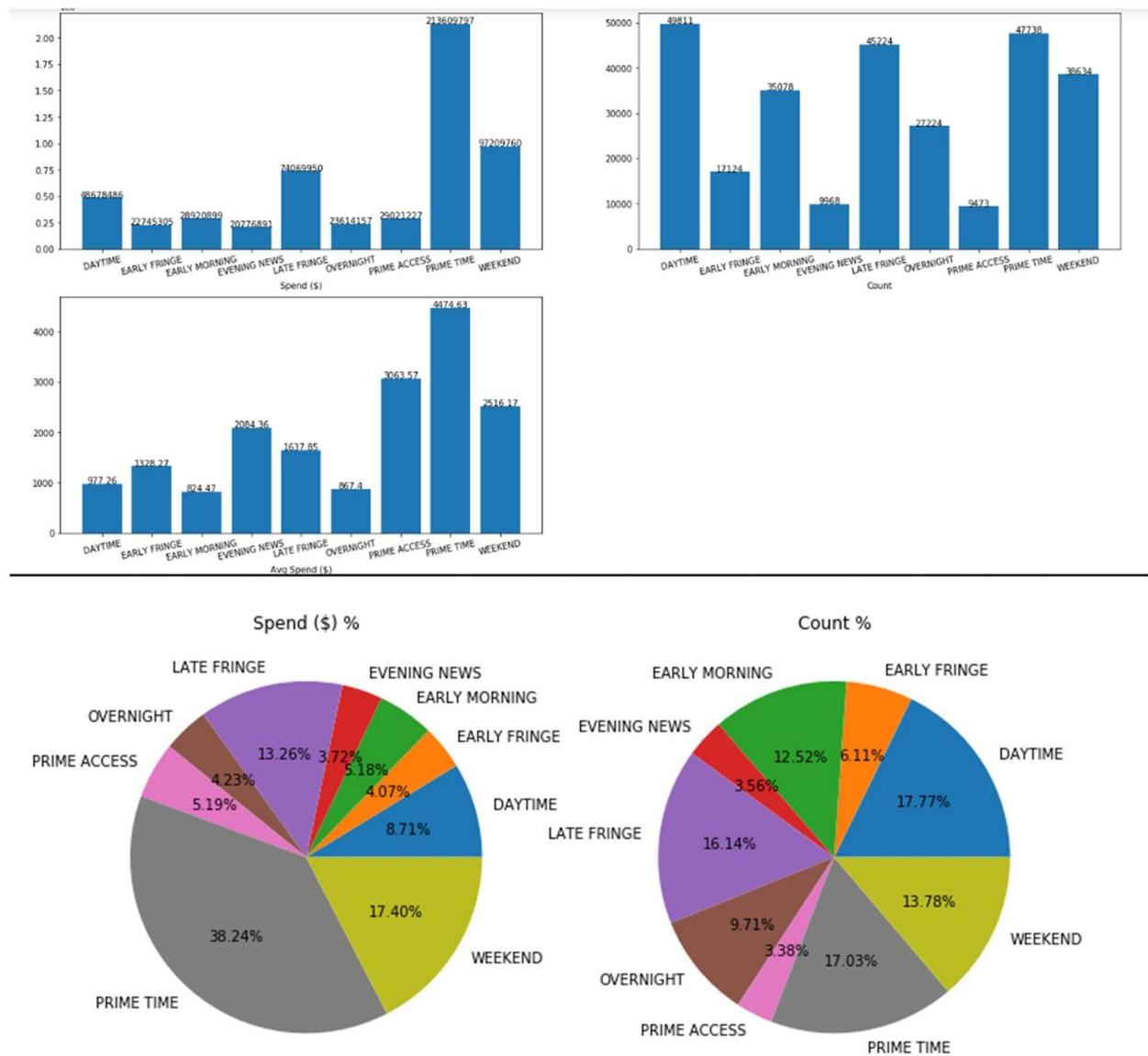


Count %



- During Q1, Maruti Suzuki ran the most ads, and also spend the most money on ads.
- After Q1, the budget for the Advs was reduced.
- During Q4, the average spend on Advs was a bit increased.

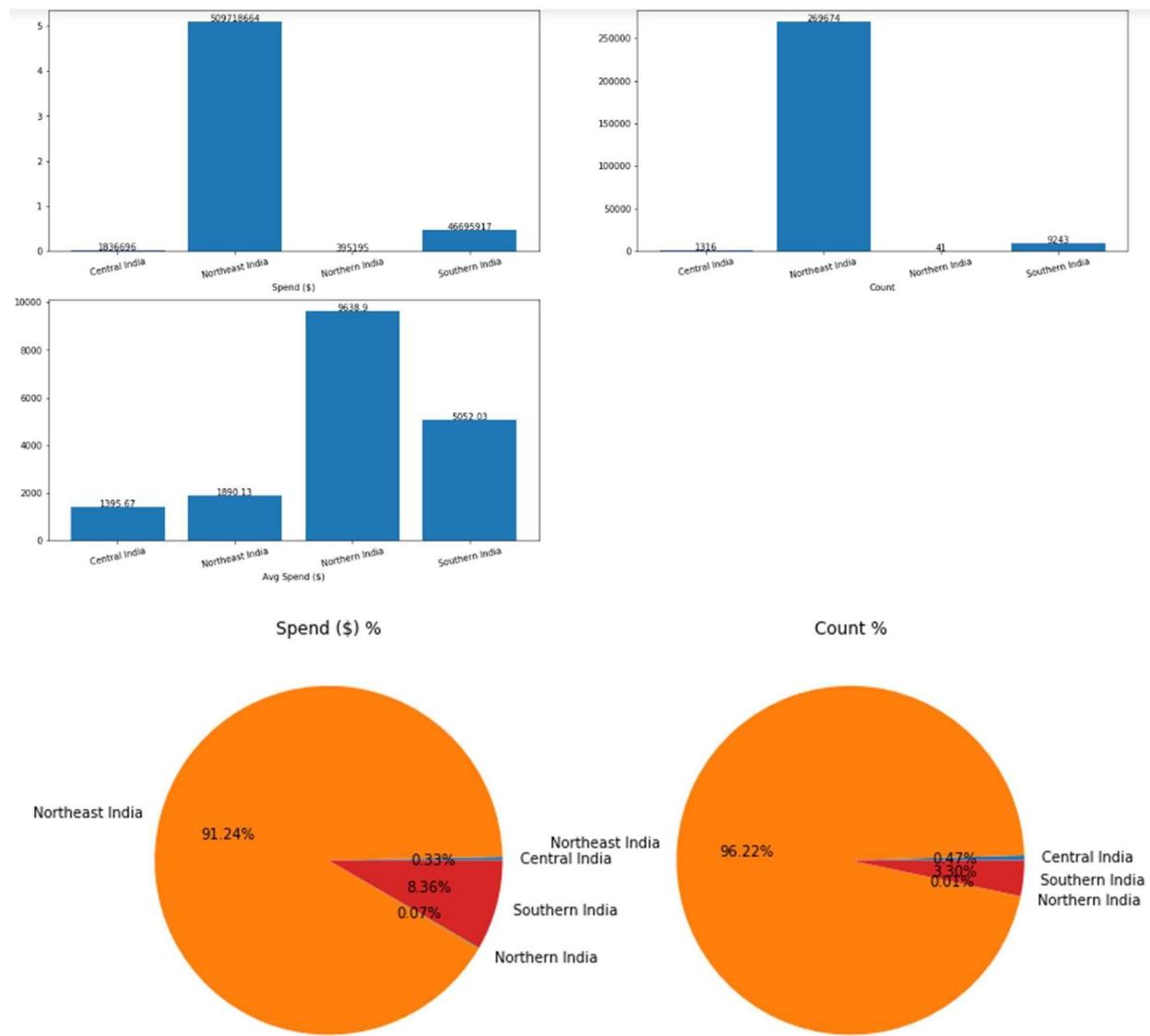
Dayparts:



- Maruti Suzuki prefers to run their ads during the Daytime, Weekend, Primetime, and Early-morning shows.

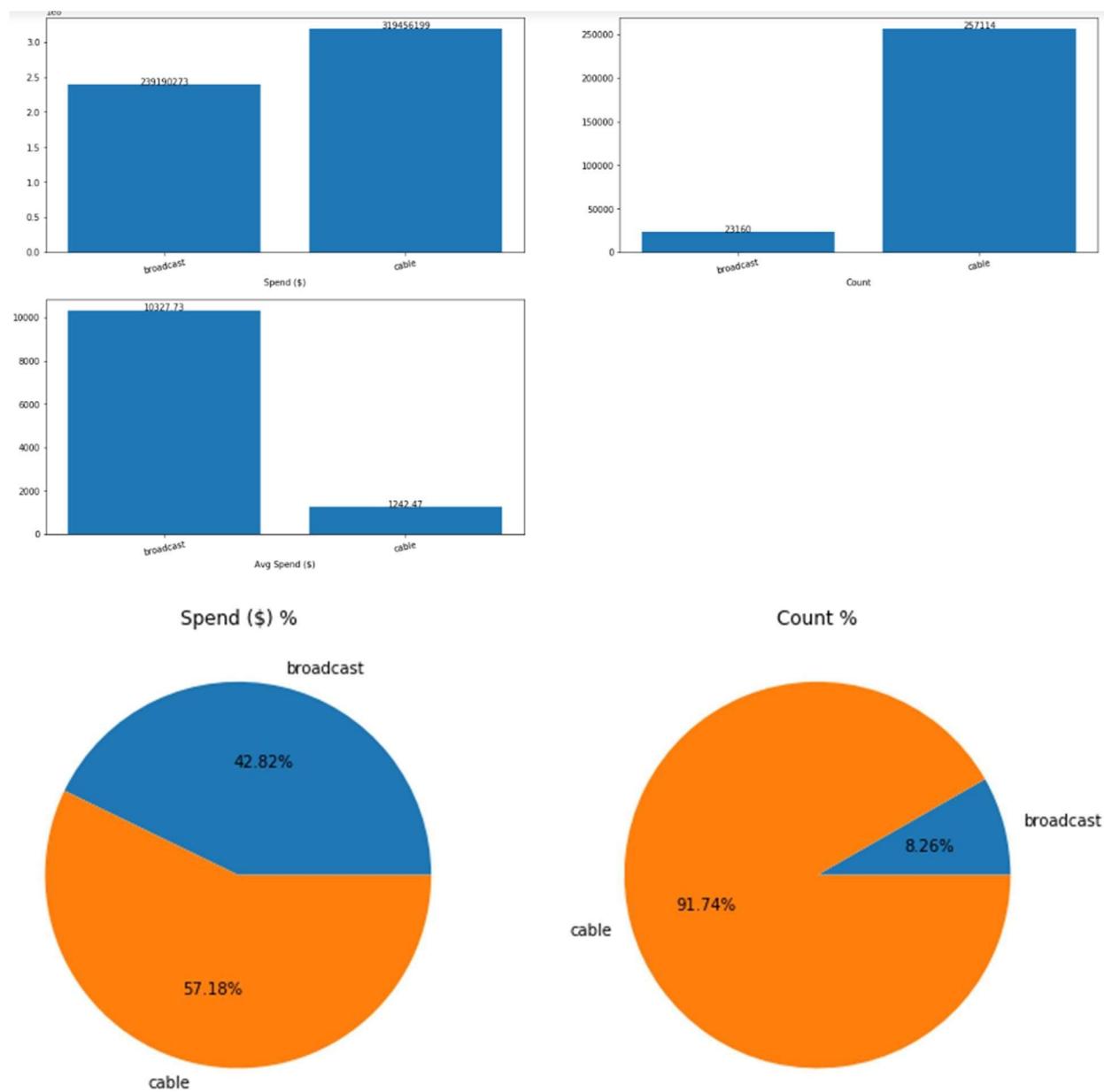
- For the primetime show, the Honda car spends 38% of its budget, and for the weekend show 17%.

#### Timezone:



- More than 95% of the Advs were run on the Northeast India timezone, also 91% of the budget was allocated for this timezone.
- The average spends on Advs in the Northern India timezone is higher than in other timezones.

## Network:



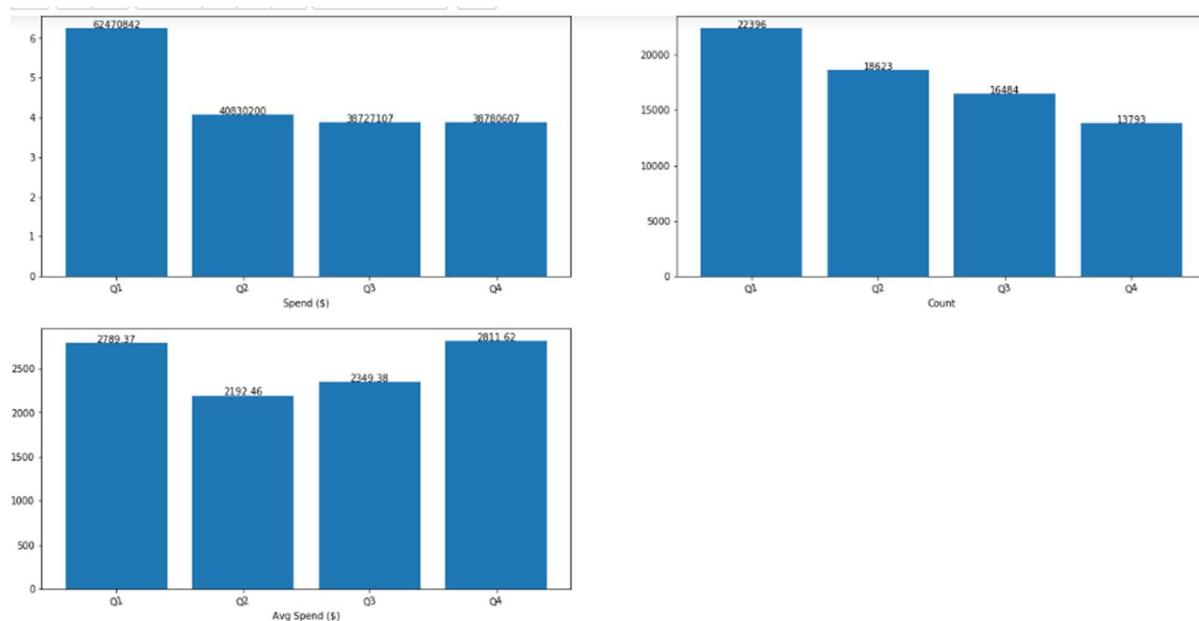
- 92% of the Advs were run on the Cable network, and 57% of the budget was allocated for this network.
- Though the spending on the cable network is a bit higher than the broadcast network, the average spend on the Broadcast network is way higher than the cable network.

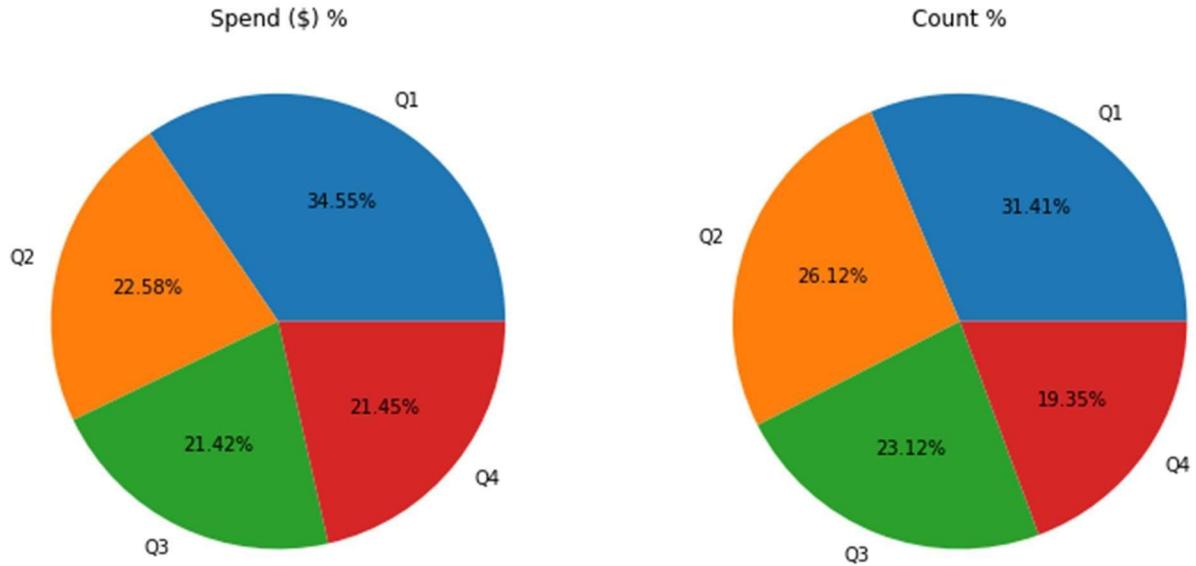
## **Hyundai Motors India:**

### Products:

- Hyundai Motors India has 1 product, it is 'Hyundai I20'
- 7 times Hyundai Motors India's advertisements were at Pod position 1 without spending a single penny.
- Hyundai Motors India spend most on promoting the Hyundai I20, on 07-02-2021 at the PRIME TIME show.

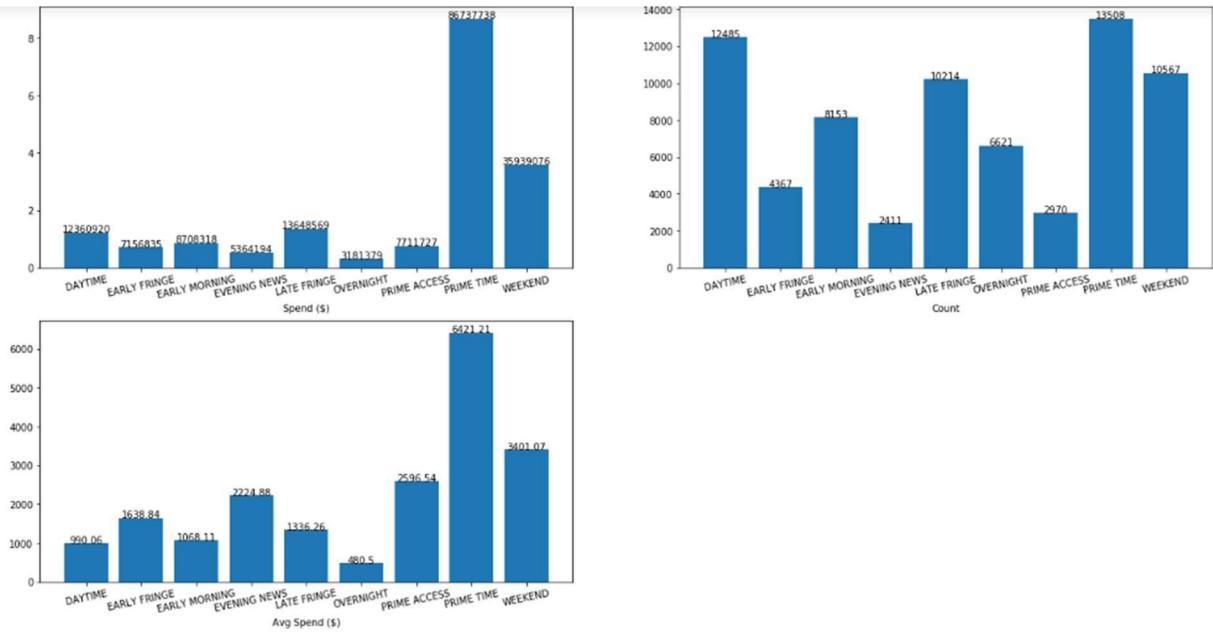
### Quarters:

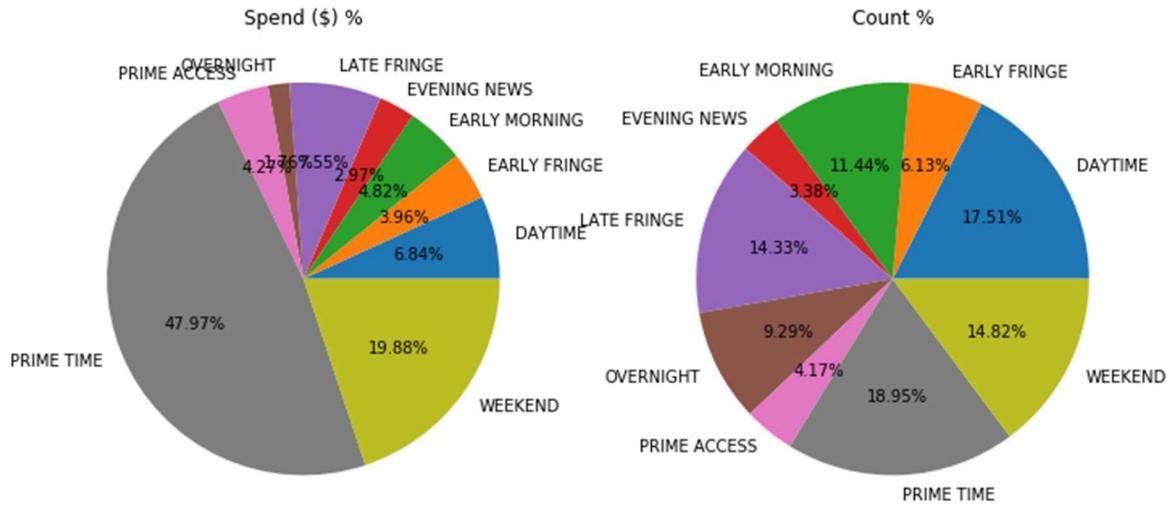




- During Q1, Hyundai Motors India ran the most ads, and also spent the most money on ads.
- After Q1, the budget for the Advs was reduced.
- During Q4, the average spend per Adv is most.

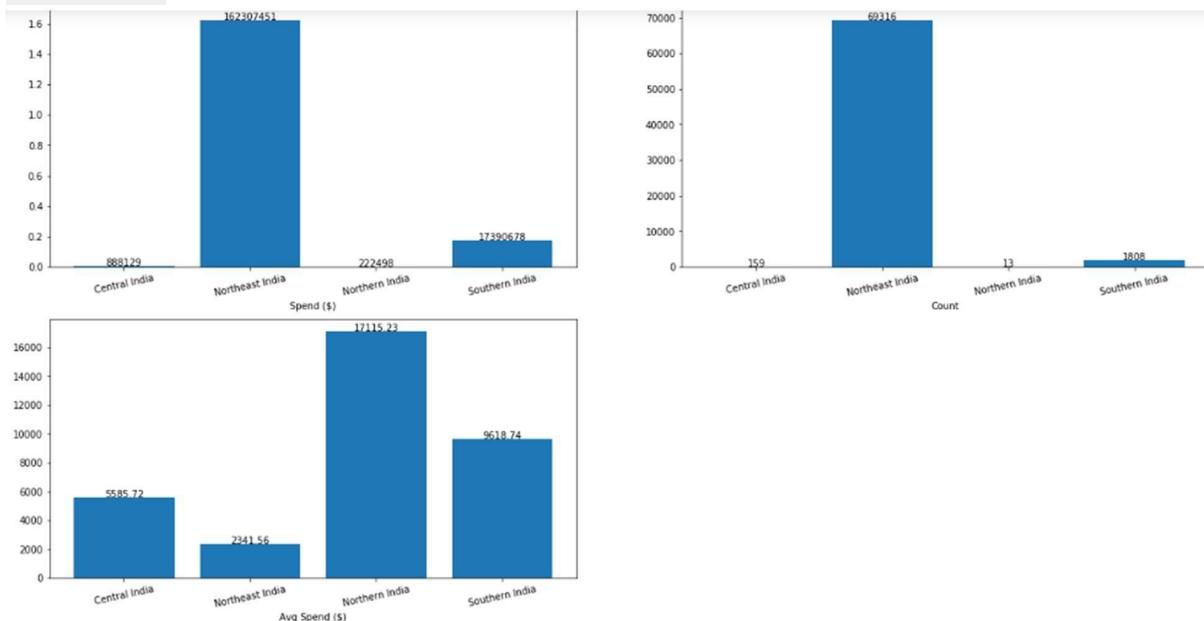
#### Dayparts:

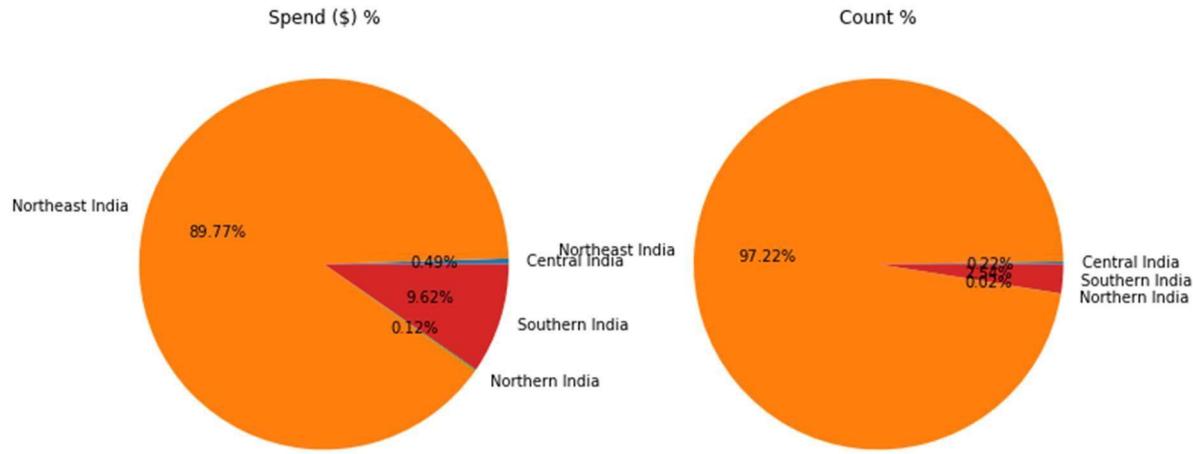




- Hyundai Motors India prefers to run their ads during the Daytime, Weekend, Primetime, Late fringe, and Early-morning shows.
- For the Primetime show, Hyundai Motors India spends 48% of its budget, and for the weekend show 20%.

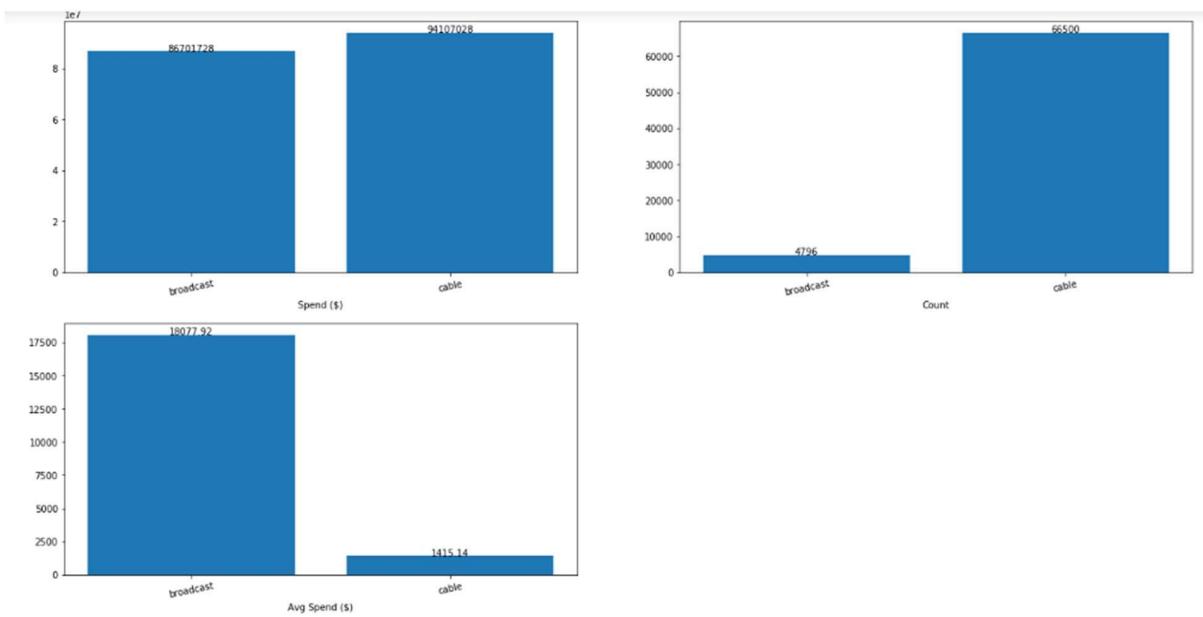
#### Timezone:

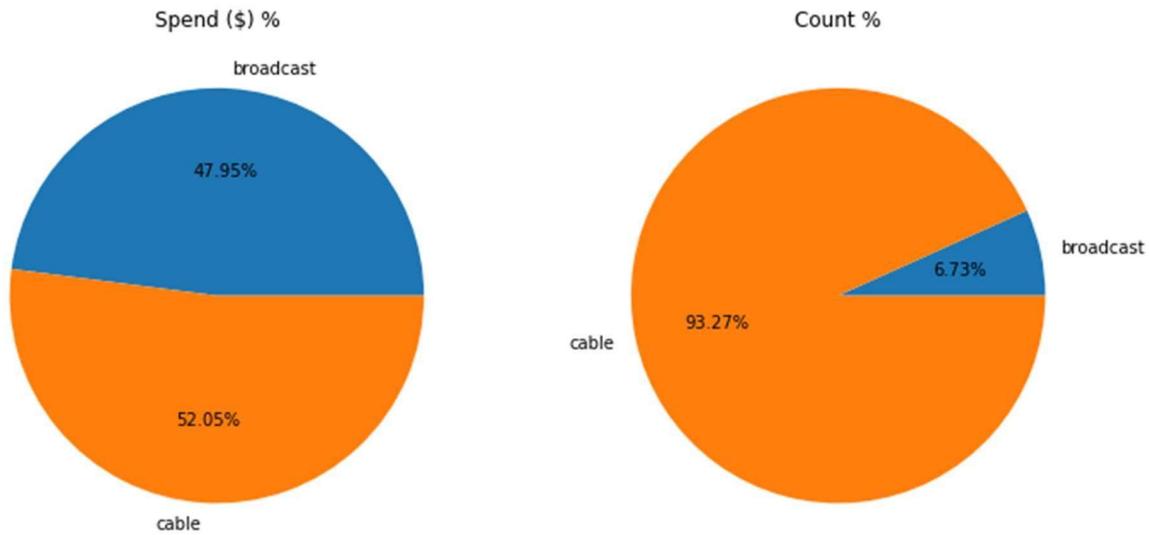




- More than 95% of the Advs were run on the Northeast India timezone, also 90% of the budget was allocated for this timezone.
- The average spending on Advs in Northern India, and Southern India timezone is higher than in other timezones.

## Network:

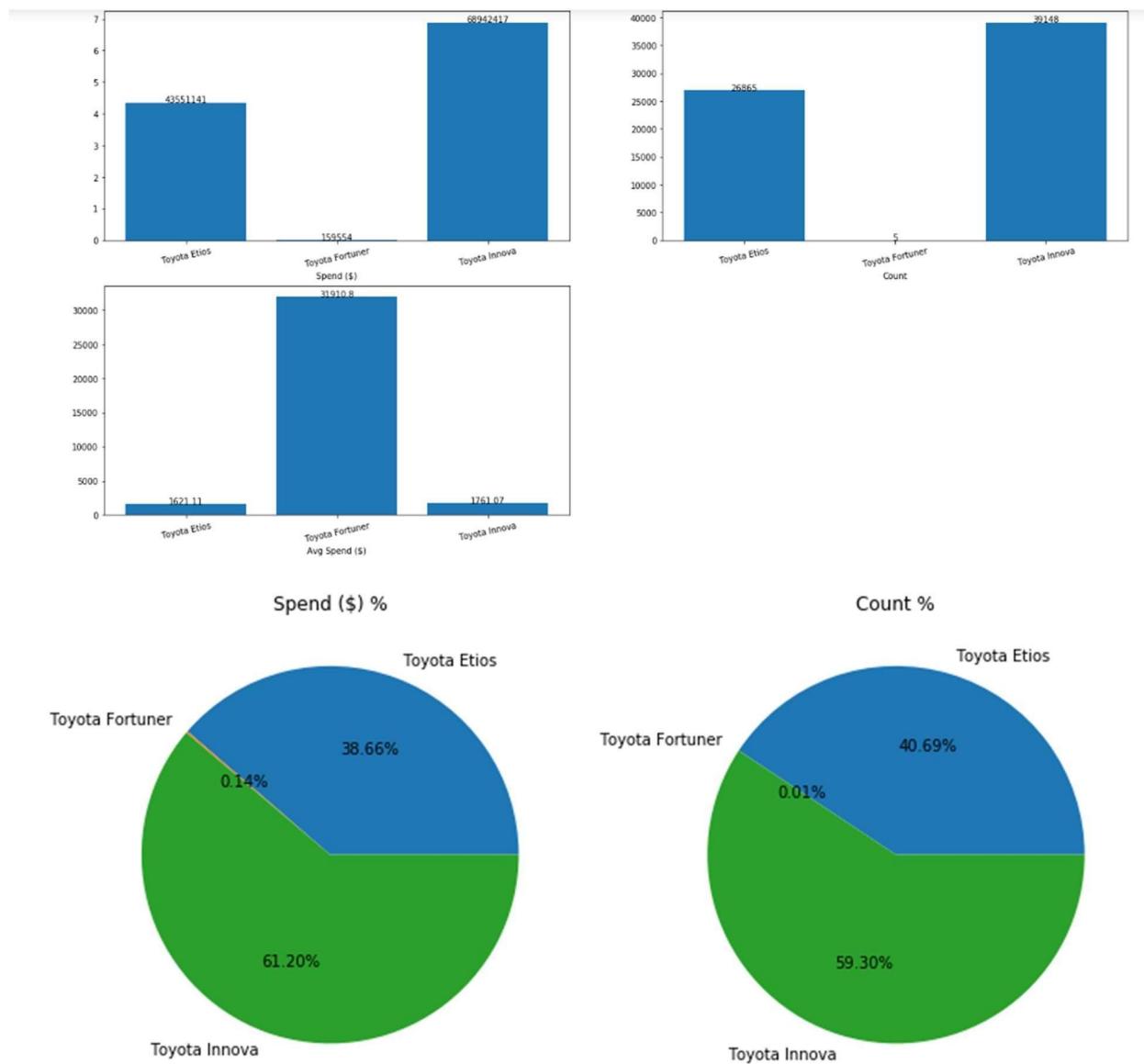




- 93% of the Advs were run on the Cable network, and 52% of the budget was allocated for this network.
- Though the spending on the cable network is a bit higher than the broadcast network, the average spend on the Broadcast network is way higher than the cable network.

## Toyota

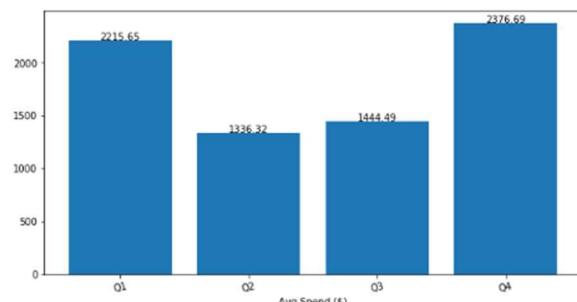
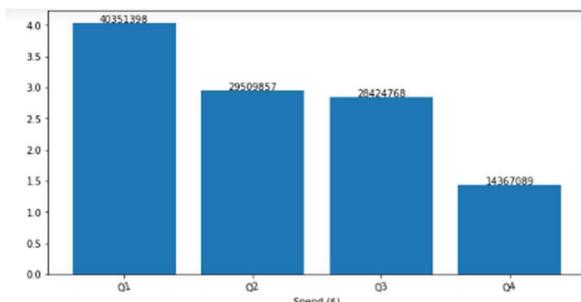
Products:



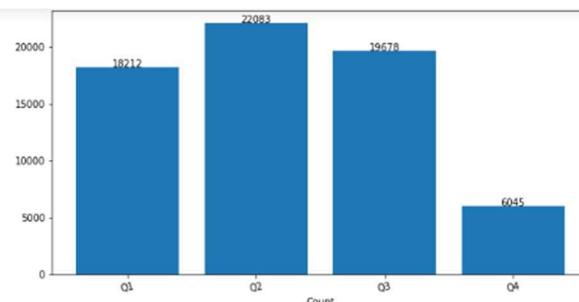
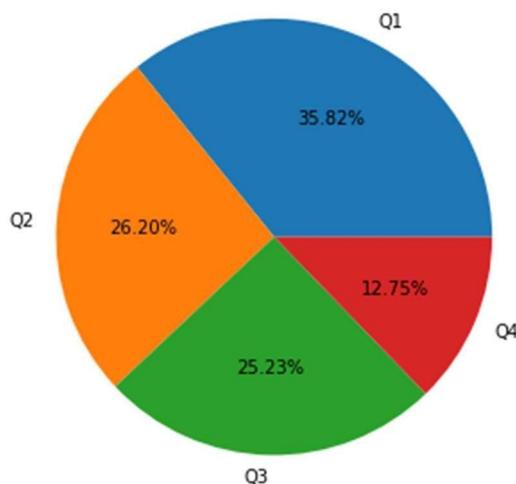
- Toyota has 3 products, they are 'Toyota Innova', 'Toyota Etios', 'And Toyota Fortuner'
- 40 times Toyota's advertisements were at Pod position 1 without spending a single penny.
- Toyota spend most on the promotion of Toyota Innova, on 05-01-2021 at the DAYTIME show.

- Out of the total advertisements ran by the Toyota brand, nearly 60% of Advs were for the promotion of Innova, also out of the total budget 61% was spent on this product.
- Though the brand ran only 5 ads for the promotion of Fortuner, the average spending per ad is USD 31910, which is the highest among other products.

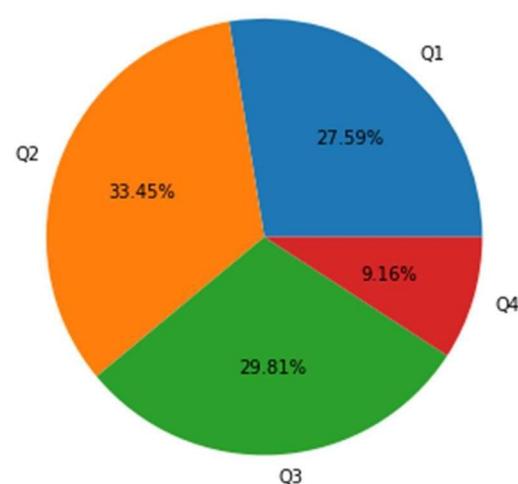
Quarters:



Spend (\$) %

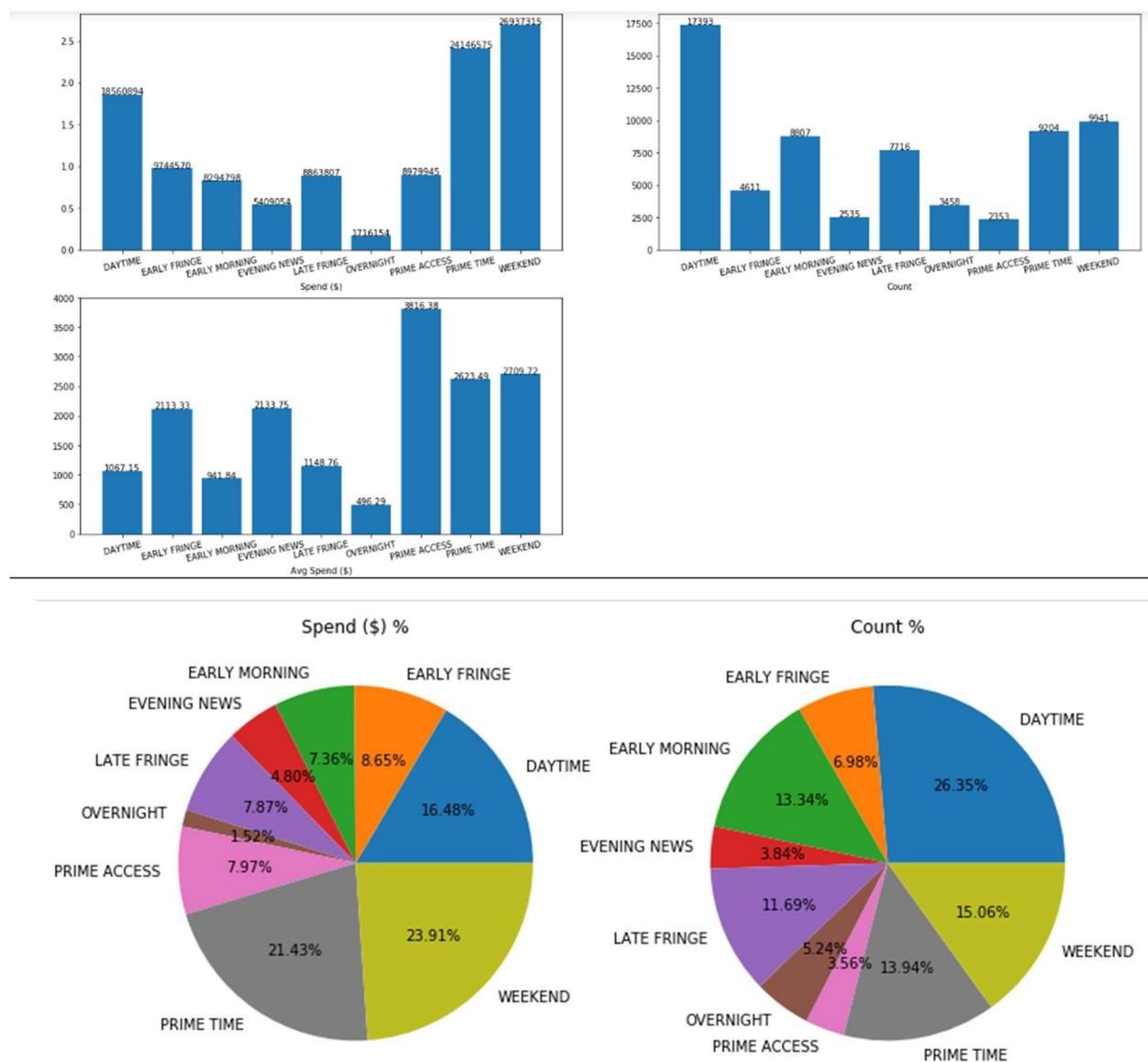


Count %



- We can see a jump in the numbers of Advs from Q1 to Q2, after that Advs were reduced.
- During Q1, Toyota ran spent the most on ads.
- After Q1, the budget for the Advs was reduced.

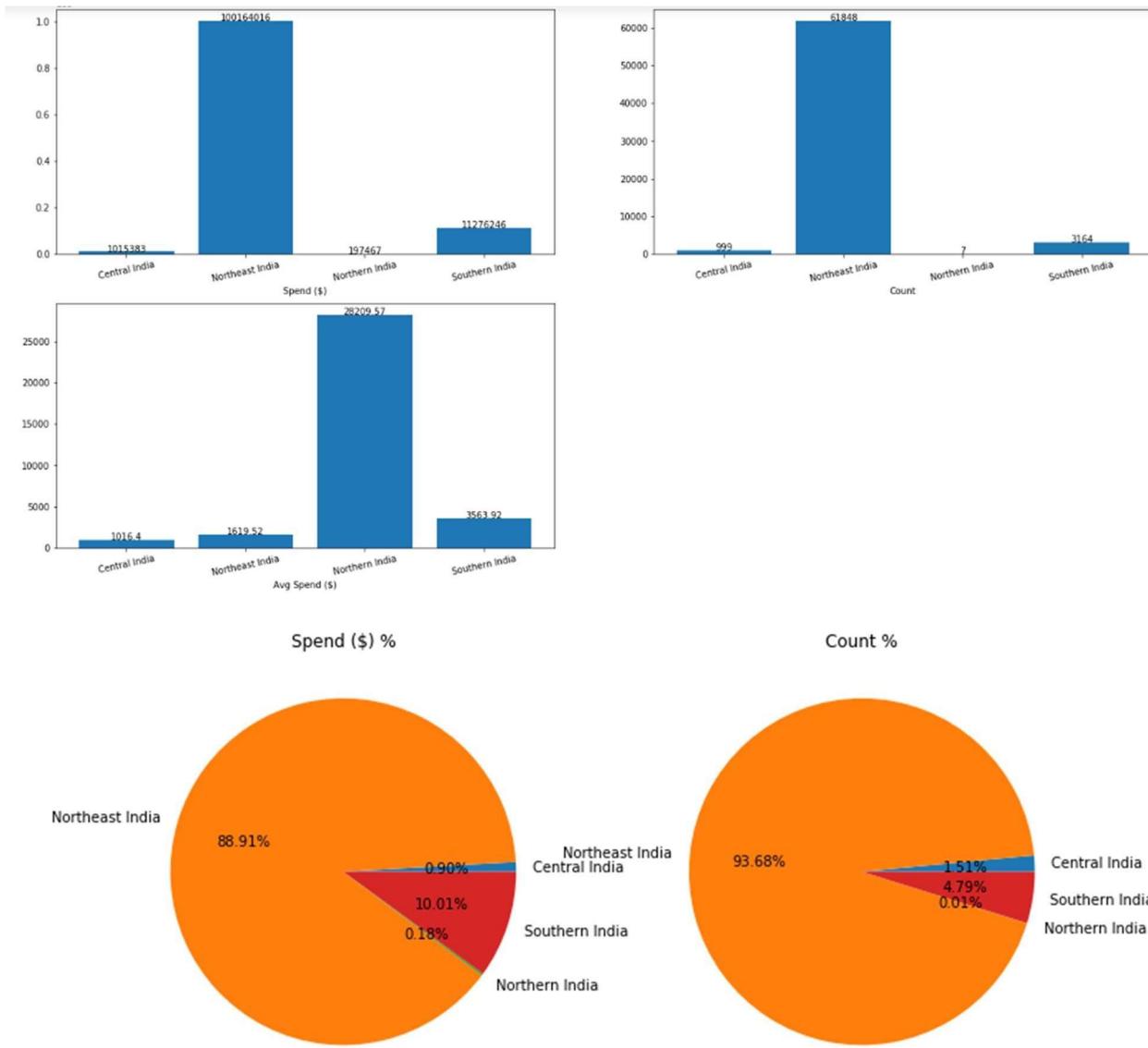
### Dayparts:



- Toyota prefers to run its ads during the Daytime, Weekend, Primetime, and Early-morning shows.

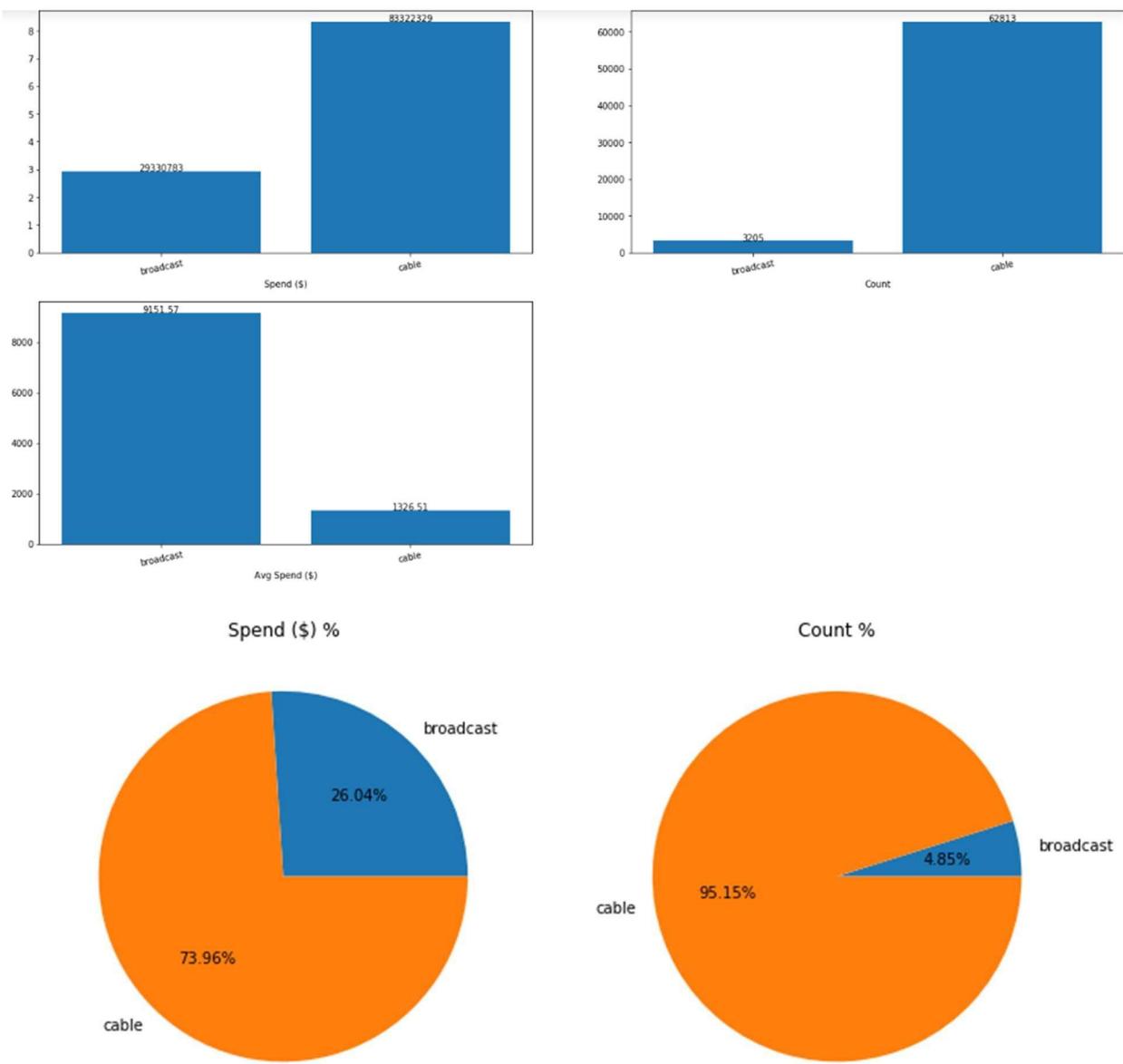
- For the Weekend show, Toyota spends 24% of its budget, for the primetime show 21%, and for the daytime show 16.5%.

### Timezone:



- More than 94% of the Advs were run on the Northeast India timezone, also 89% of the budget was allocated for this timezone.
- The average spends on Advs in the Northern India timezone is higher than in other timezones.

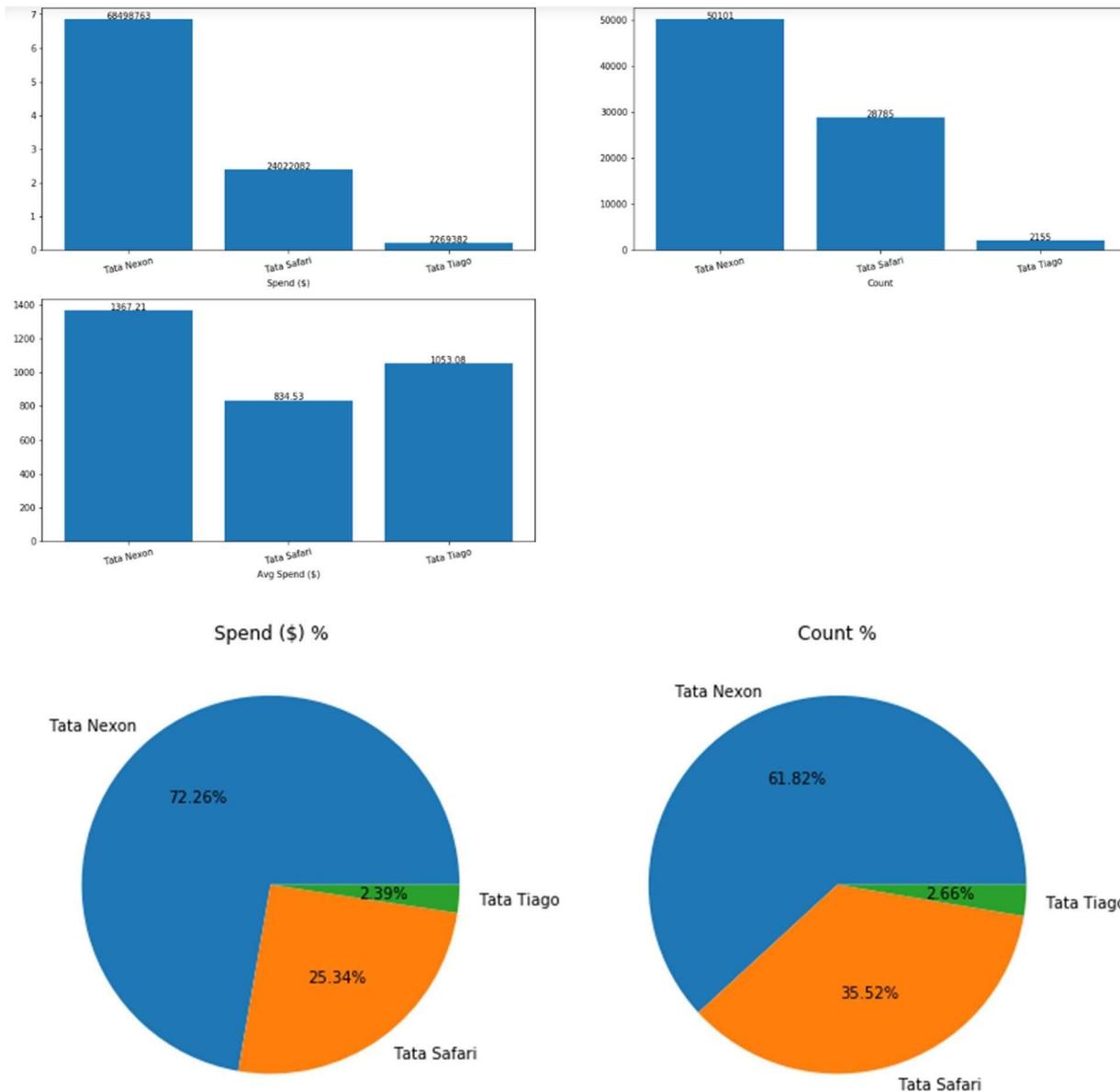
## Network:



- 95% of the Advs were run on the Cable network, and 74% of the budget was allocated for this network.
- Though the spend on the cable network is higher than the broadcast network, the average spend on the Broadcast network is way higher than the cable network.

## Tata Motors:

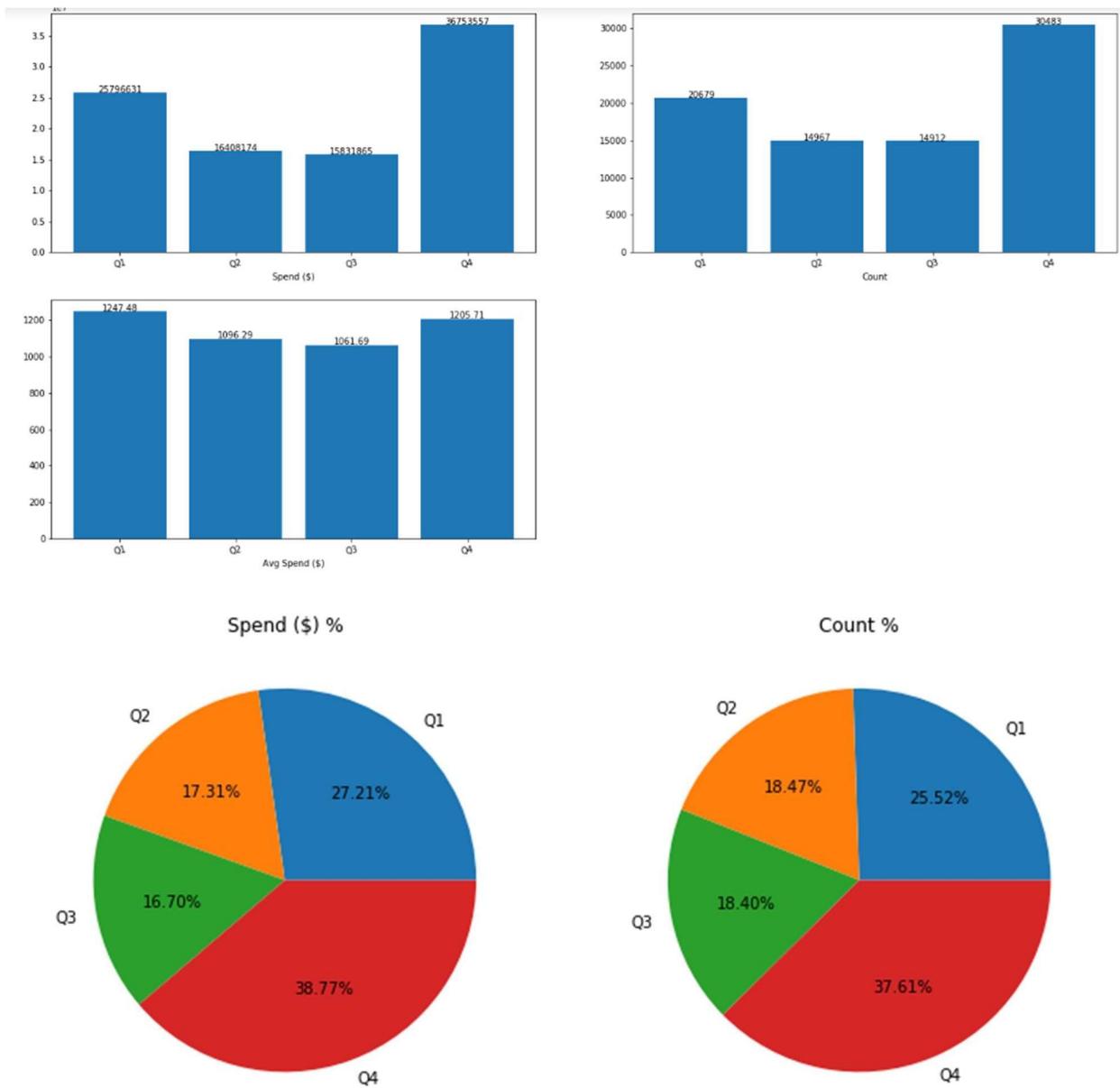
Products:



- Tata Motors has 3 products, they are 'Tata Tiago', 'Tata Safari', 'And Tata Nexus'.
- 5 times Tata Motors's advertisements were at Pod position 1 without spending a single penny.

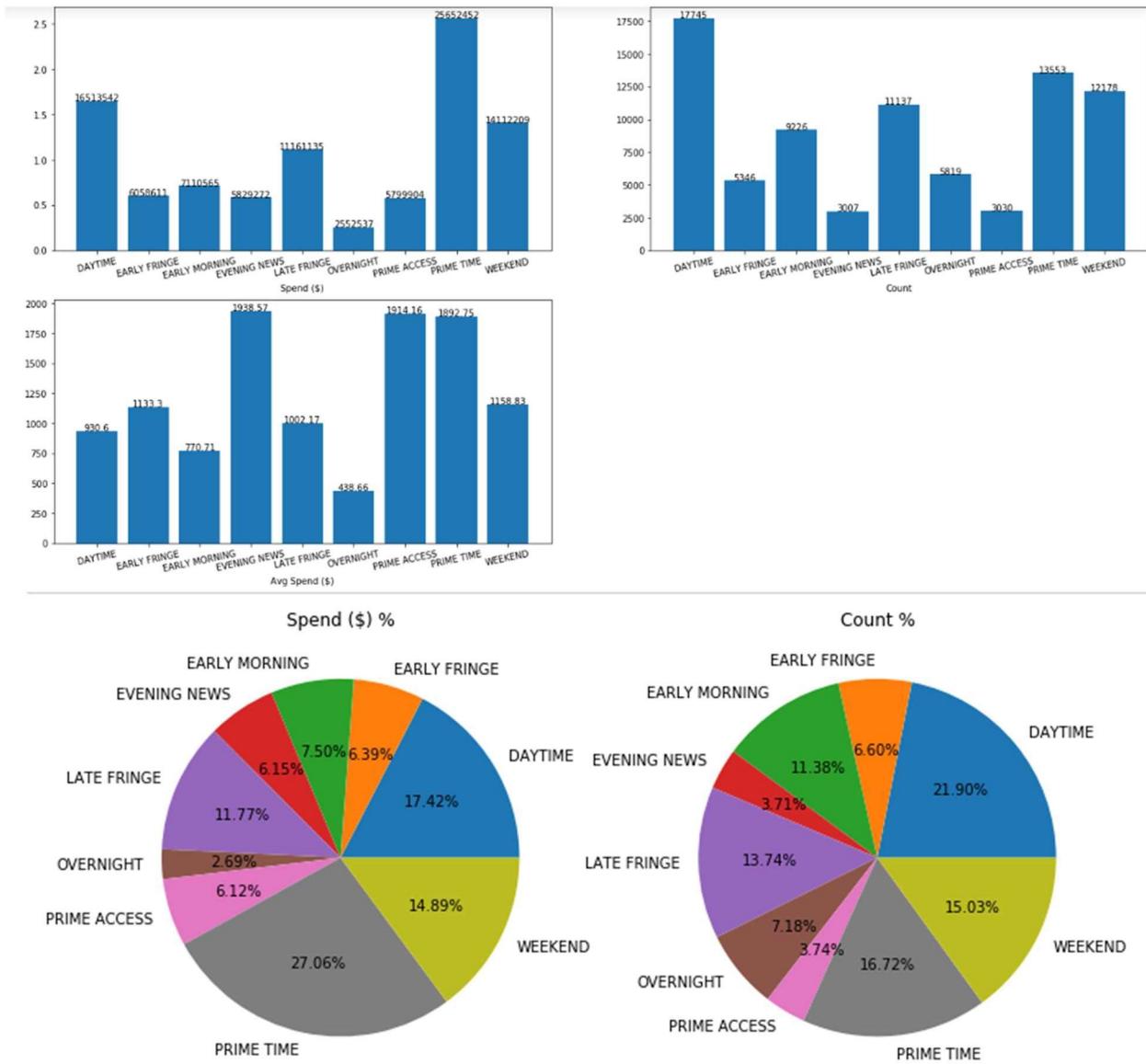
- Tata Motors spend the most on promoting Tata Nexon, on 01-12-2021 at the PRIME TIME show.
- Out of the total advertisements ran by Tata Motors brand, nearly 62% of Advs were for the promotion of Tata Nexon, also out of the total budget 72% was spent for this product.

Quarters:



- Tata gave the most focus on Q4, not like other brands who spent more on Q1.
- Average spending in all quarters is quite symmetric.

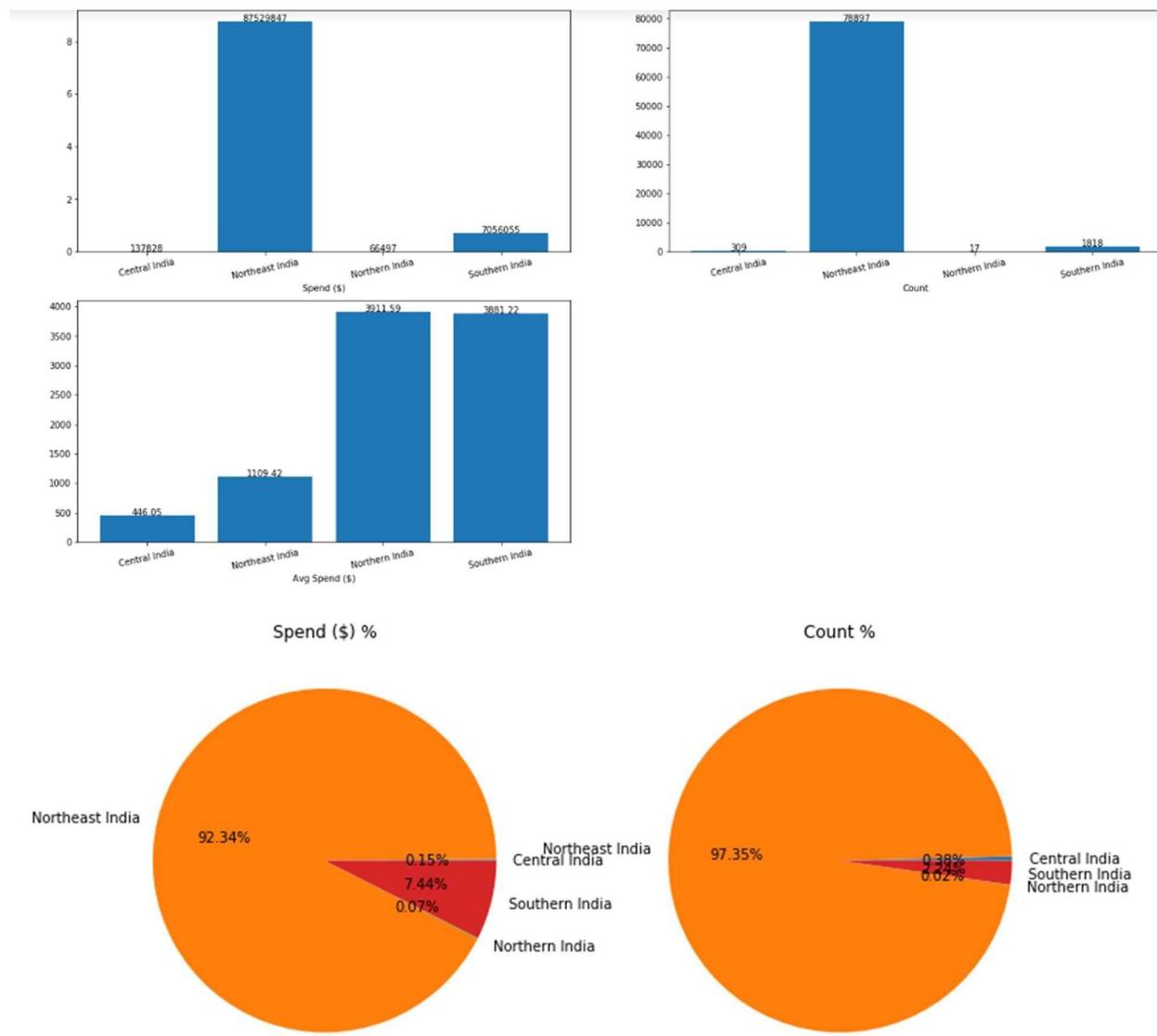
Dayparts:



- Tata Motors prefers to run its ads during the Daytime, Weekend, Primetime, Late-fringe, and Early-morning shows.

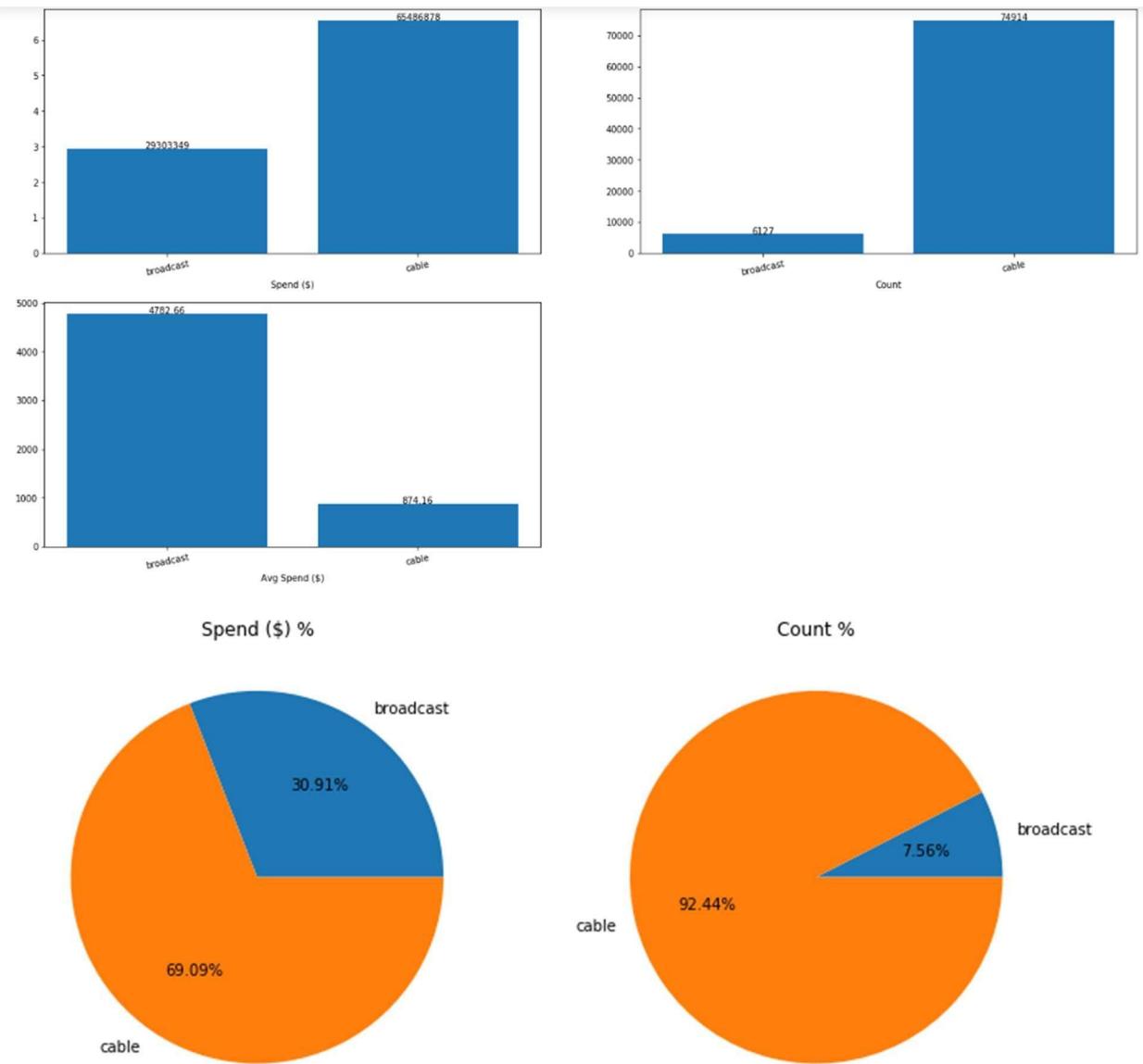
- For the primetime show, Tata Motors spends 27% of its budget, and for the weekend show 15%, for the daytime show 17% & for the late-fringe show 12%.

Timezone:



- More than 95% of the Advs were run on the Northeast India timezone, also 92% of the budget was allocated for this timezone.
- The average spending on Advs in Northern India, and Southern India timezone is higher than in other timezones.

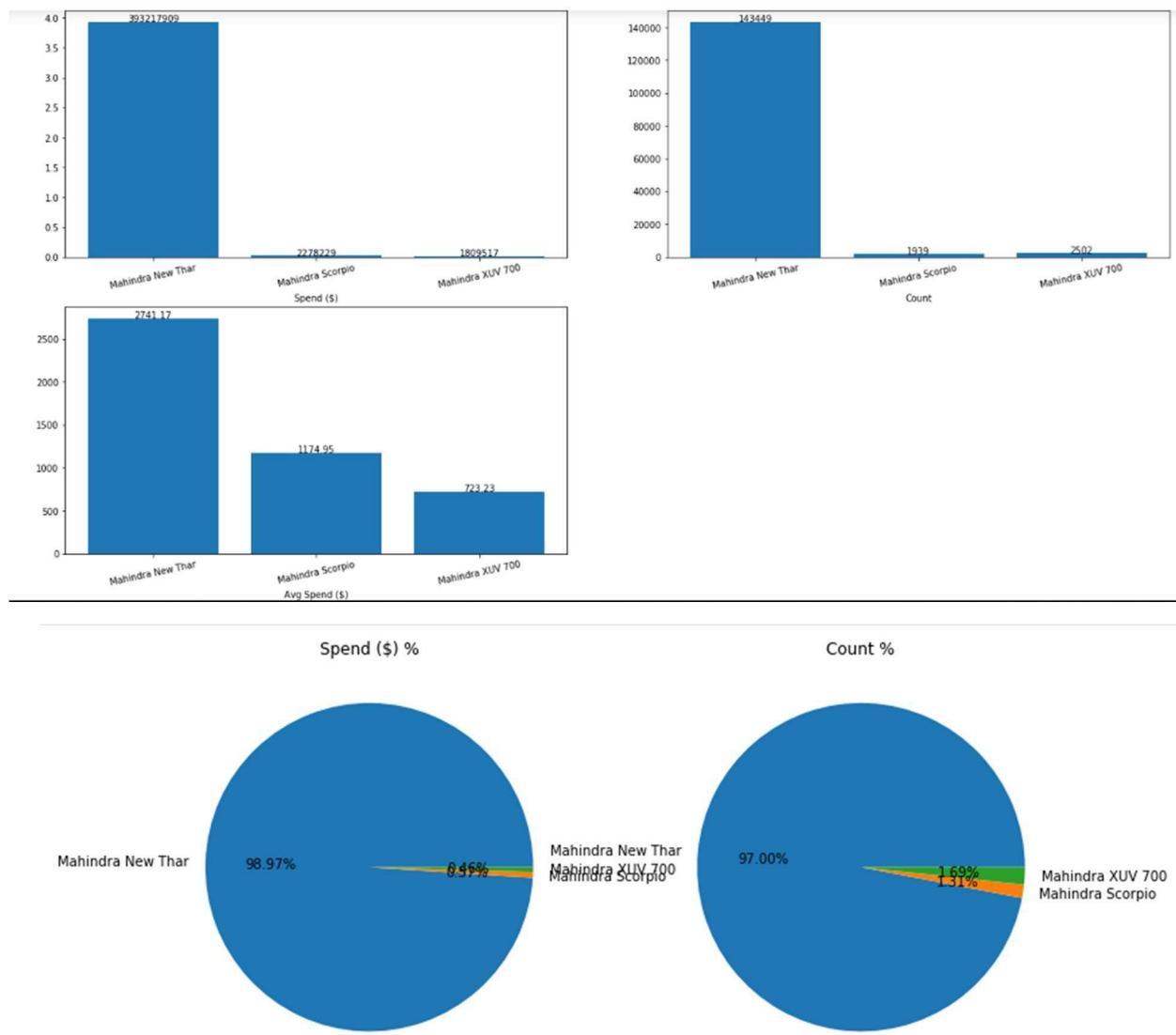
## Network:



- 92% of the Advs were run on the Cable network, and 69% of the budget was allocated for this network.
- Though the spend on the cable network is higher than the broadcast network, the average spend on the Broadcast network is way higher than the cable network.

## Mahindra and Mahindra:

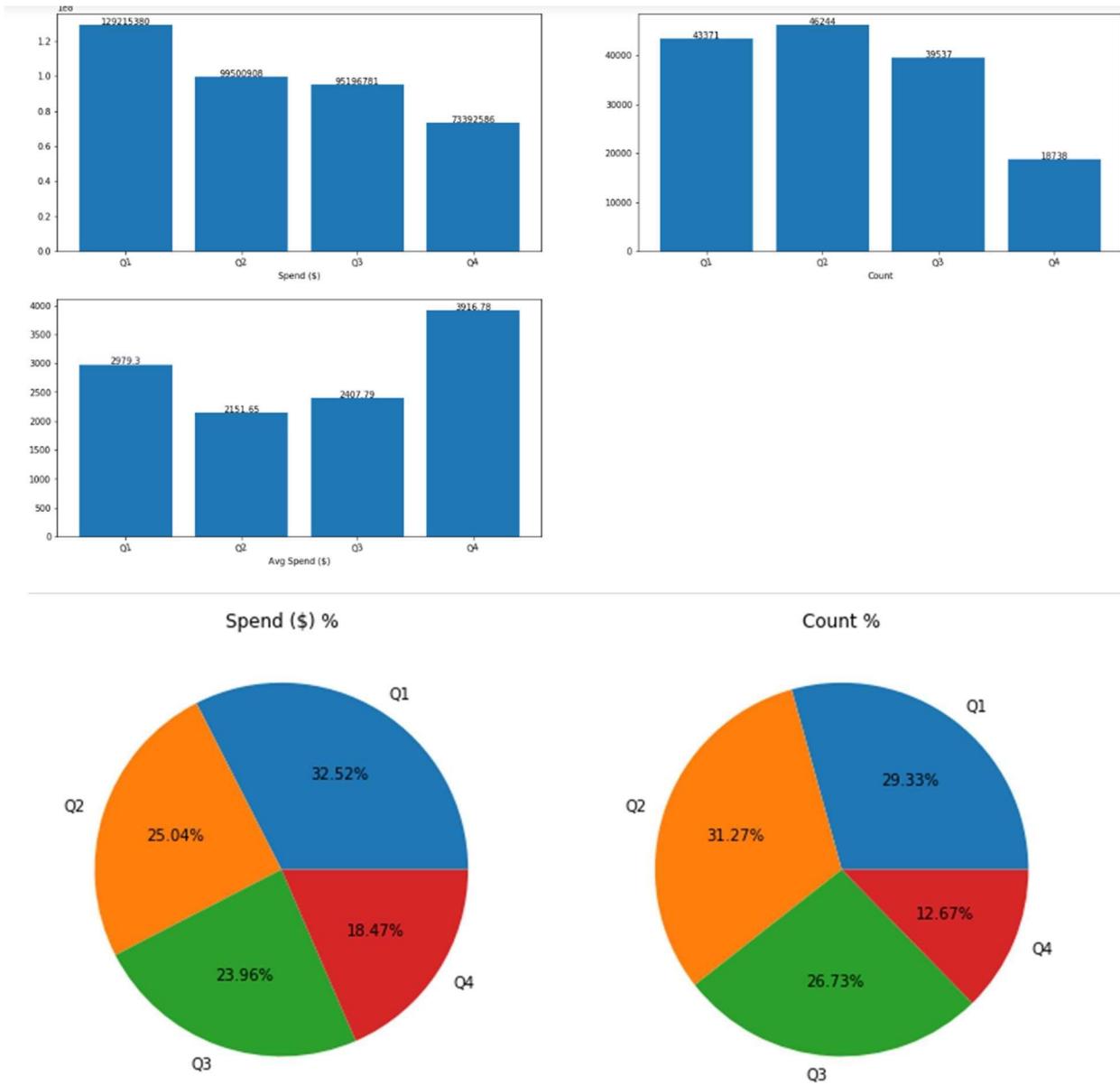
Products:



- Mahindra and Mahindra has 3 products, they are 'Mahindra XUV 700', 'Mahindra New Thar', 'Mahindra Scorpio'
- 210 times Mahindra and Mahindra's advertisements were at Pod position 1 without spending a single penny.
- Mahindra and Mahindra spend the most on promoting Mahindra New Thar, on 04-04-2021 at the PRIME TIME show.

- Out of the total advertisements ran by Mahindra and Mahindra brand, 97% of Advs were for the promotion of Thar, also out of the total budget 99% was spent on this product.

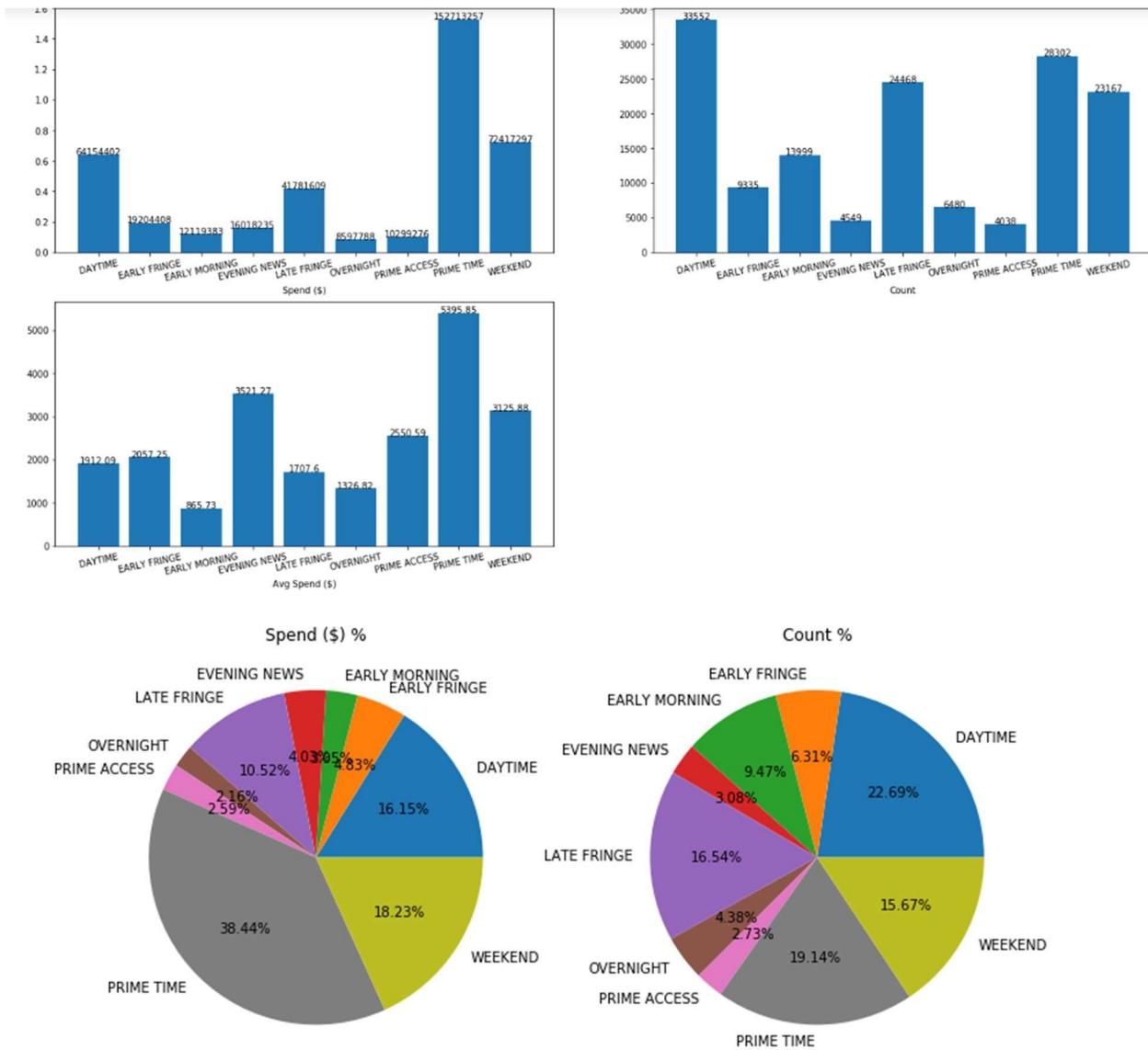
Quarters:



- During Q2, Mahindra and Mahindra ran the most ads, and also spend the most money on ads.
- After Q1, the budget for the Advs was reduced.

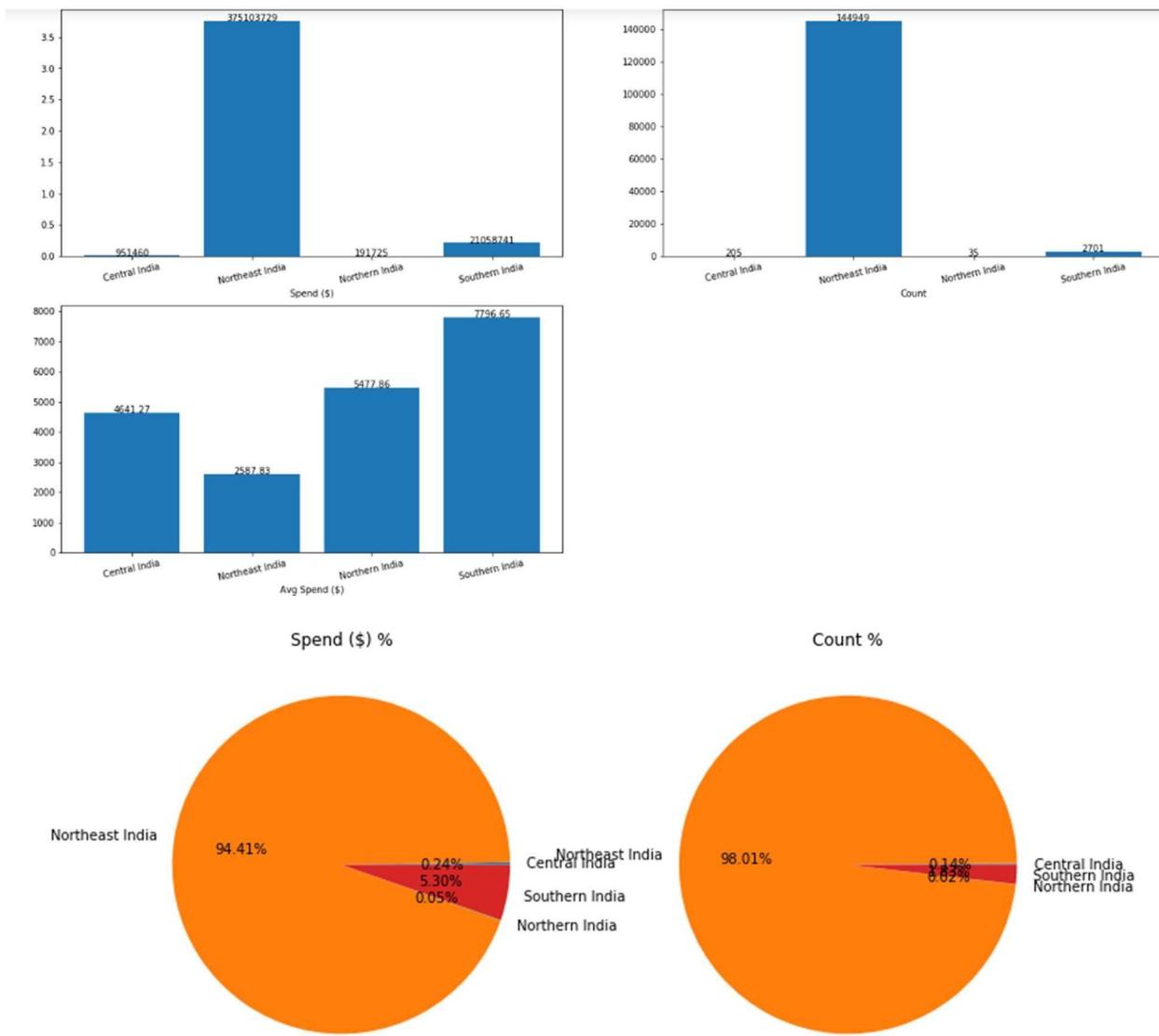
- During Q4, Mahindra and Mahindra has the highest per Adv spend.

Dayparts:



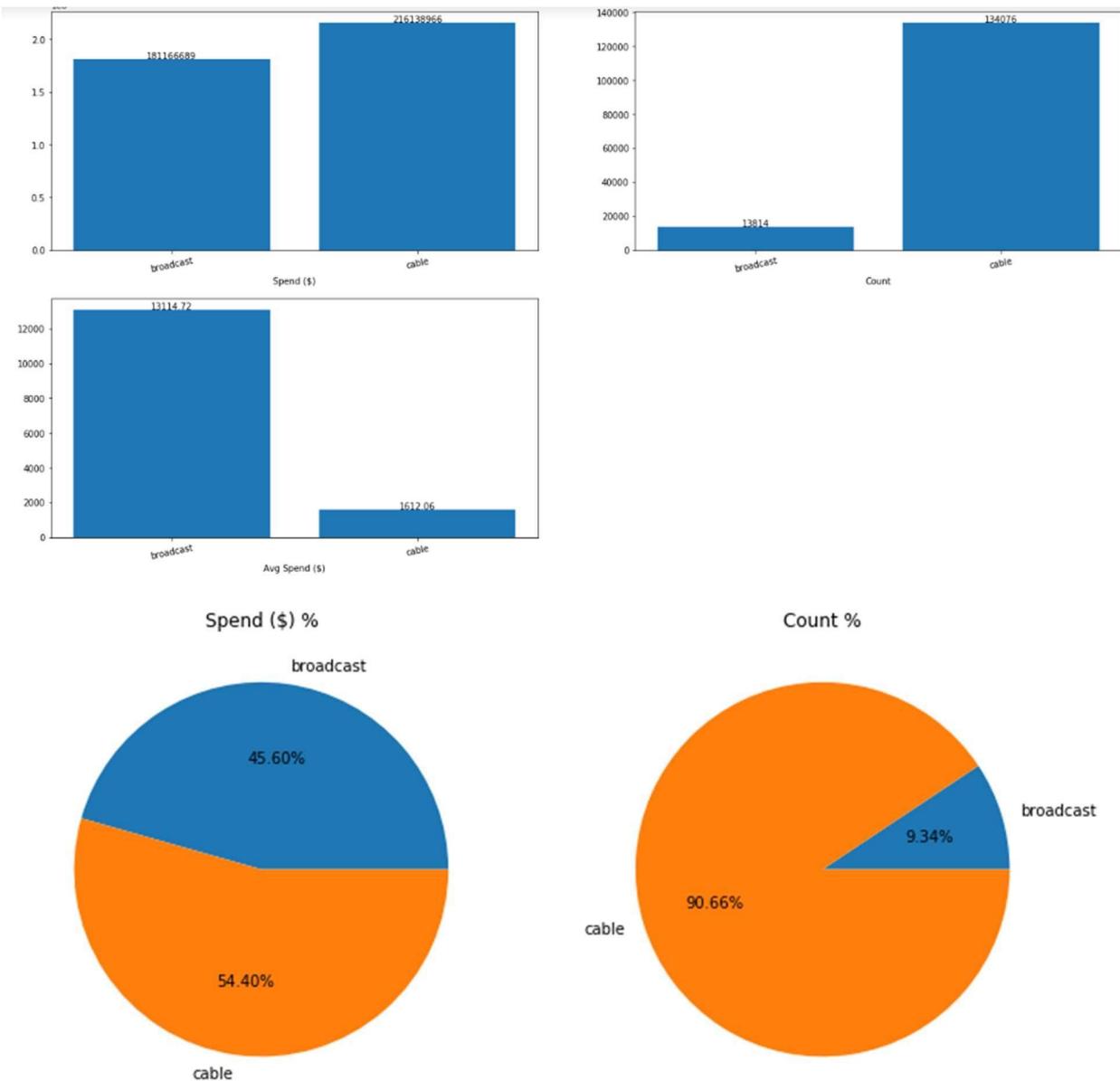
- Mahindra and Mahindra prefer to run their ads during the Daytime, Weekend, Primetime, and late-fringe shows.
- For the primetime show, Mahindra and Mahindra spends 38% of their budget, for the weekend show 18%, and for the daytime show 16%.

## Timezone:



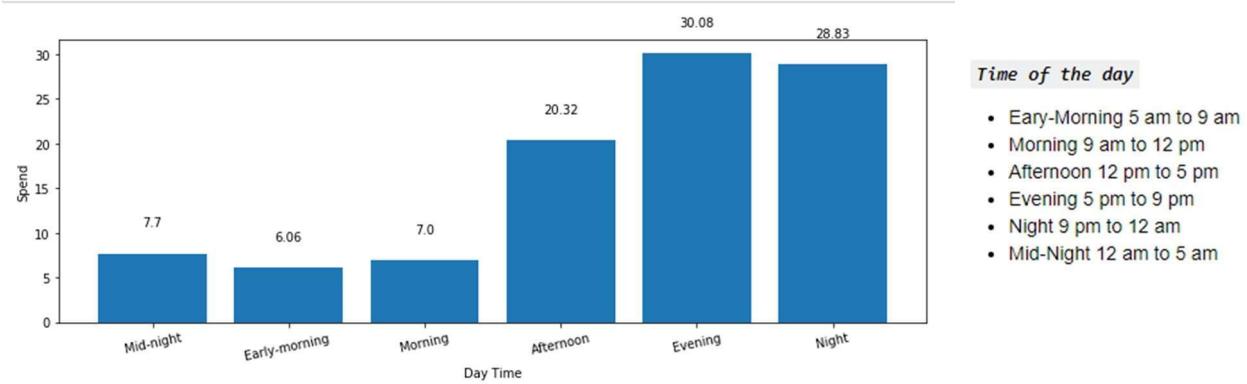
- More than 95% of the Advs were run on the Northeast India timezone, also 94% of the budget was allocated for this timezone.
- The average spending on Advs in the Southern India & Northern India timezone is higher than in other time zones.

## Network:

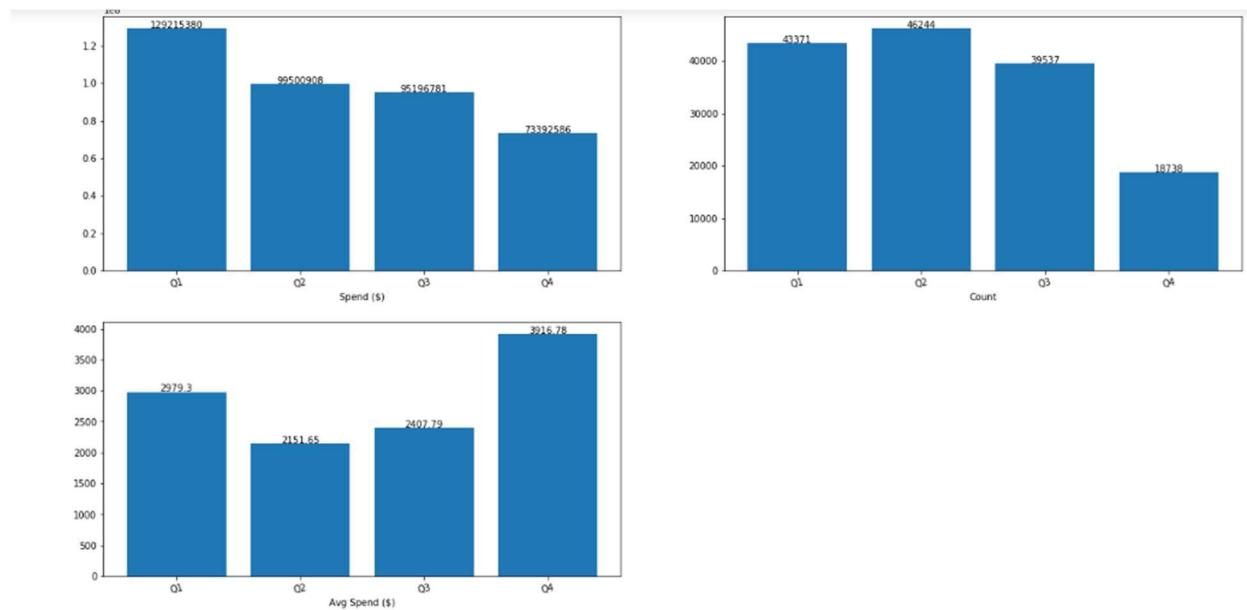


- 90% of the Ads were run on the Cable network, and 54% of the budget was allocated for this network.
- Though the spending on the cable network is a bit higher than the broadcast network, the average spend on the Broadcast network is way higher than the cable network.

**Q4. Mahindra and Mahindra want to run a digital ad campaign to complement its existing TV ads in Q1 of 2022. Based on the data from 2021, suggest a media plan to the CMO of Mahindra and Mahindra. Which audience should they target? \*Assume XYZ Ads has the ad viewership data and TV viewership for the people in India.**

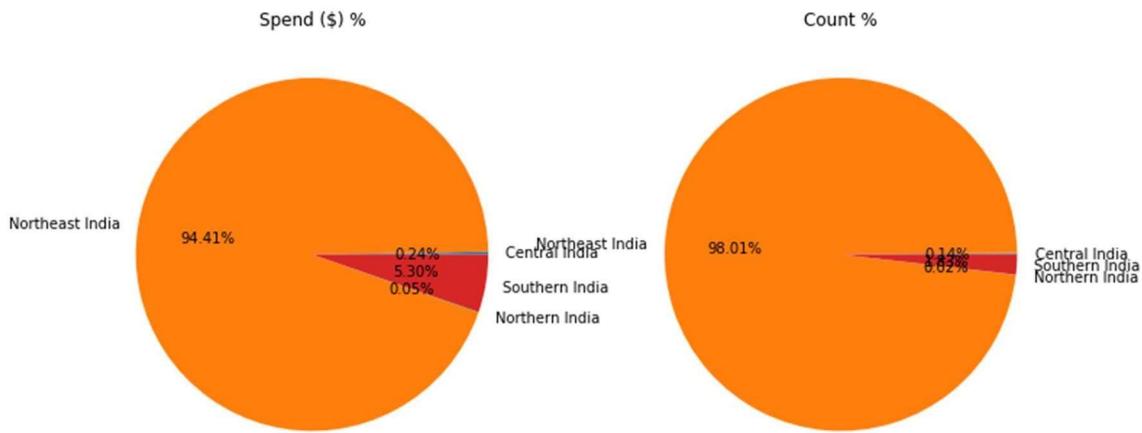


- During Early-Morning M&M should run more ads, as people tend to watch TV/Shows before going to work.



- Previously we see that M&M most ads were running @Q2 and most spends were @Q1 and there is a 52% downfall in ads count and a 23% downfall in ads spend from Q3 to Q4, but we found out that Spend v/s Pod position has maximum negative correlation @Q4. So M&M should give more focus on

Q4. Because in India Q4 is a festival season (Durga Puja, Diwali, Bhaiphota...etc), at this time people get more free time to watch TV/Shows, also during the festival time people love to spend.



- M&M ran 98% of its ads and spends 94% of the budget in the Northern India timezone only, M&M should run their ads in the other timezone also, as it would help them to register their presence in Pan India.