GROUP ELEVEN
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PopCrt Digital Marketing

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PROBLEM

The purpose of this study is to determine the effectiveness of PopCrt Digital Marketing campaigns based on 1) Product popularity, 2) Campaign performance and 3) Location-based engagement through data analysis in Microsoft Excel and Structured Query Language (SQL).

METHODOLOGY

Analyze marketing impressions and sales data in SQL and convert to Excel tables for visualization. The following are the SQL syntaxes used:

Import .csv data to PostgreSQL

```
CREATE TABLE IF NOT EXISTS marketing_impressions(
      session id integer,
      user_id integer,
      campaign_id integer,
      campaign name character varying,
      webpage id integer,
      product category character varying,
      gender text,
      age level character varying,
      region text,
      is_click boolean
);

CREATE TABLE IF NOT EXISTS sales_data(
      session id integer,
      user id integer,
      product category character varying,
      region text,
      is campaign boolean,
      total_php numeric
);

SELECT * FROM marketing impressions;
SELECT * FROM sales_data;
```

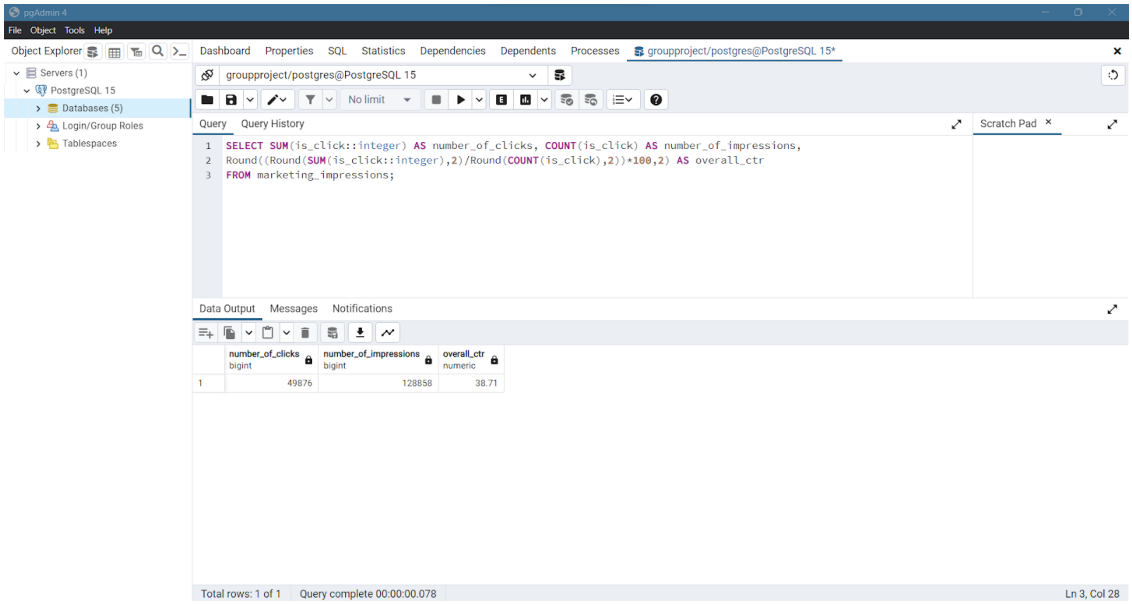
1. Calculate for overall click-through-rate (CTR) given the formula:
   (Number of clicks / Number of impressions) x 100

   SQL syntax

```
SELECT SUM(is_click::integer) AS number_of_clicks,
COUNT(is_click) AS number_of_impressions,

Round((Round(SUM(is_click::integer),2)/Round(COUNT(is_click),2)
)*100,2) AS overall_ctr
FROM marketing_impressions;
```

   PostgreSQL output

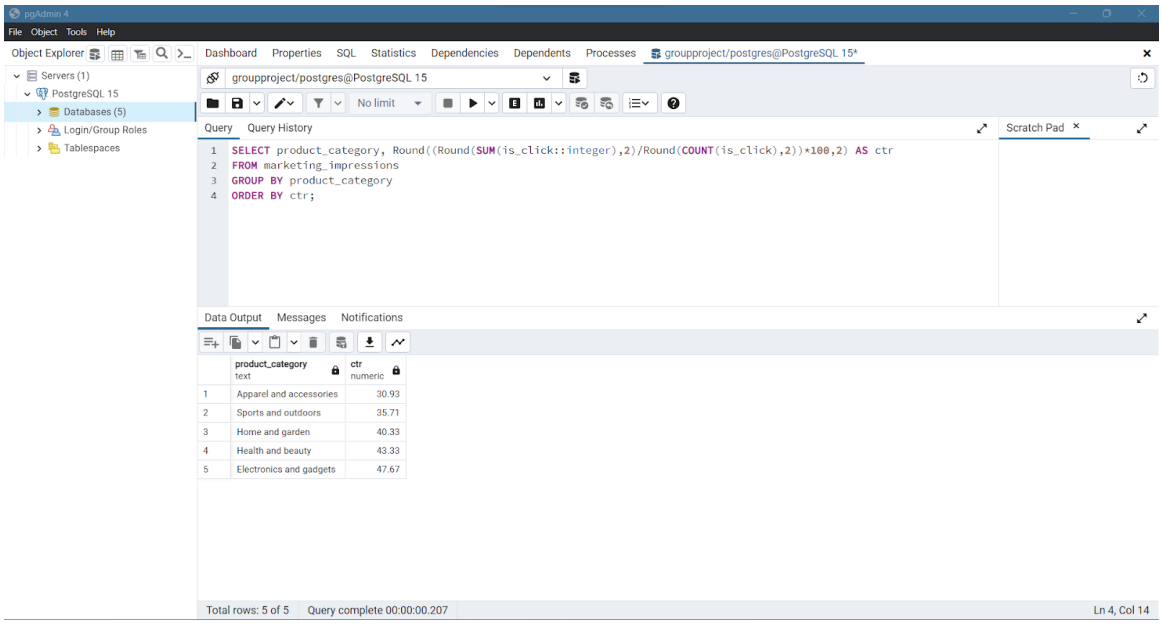


2. Calculate CTR for each product category:

   SQL syntax

```
SELECT product_category,
Round((Round(SUM(is_click::integer),2)/Round(COUNT(is_click),2))
*100,2) AS ctr
FROM marketing impressions
GROUP BY product_category
ORDER BY ctr;
```

PostgreSQL output

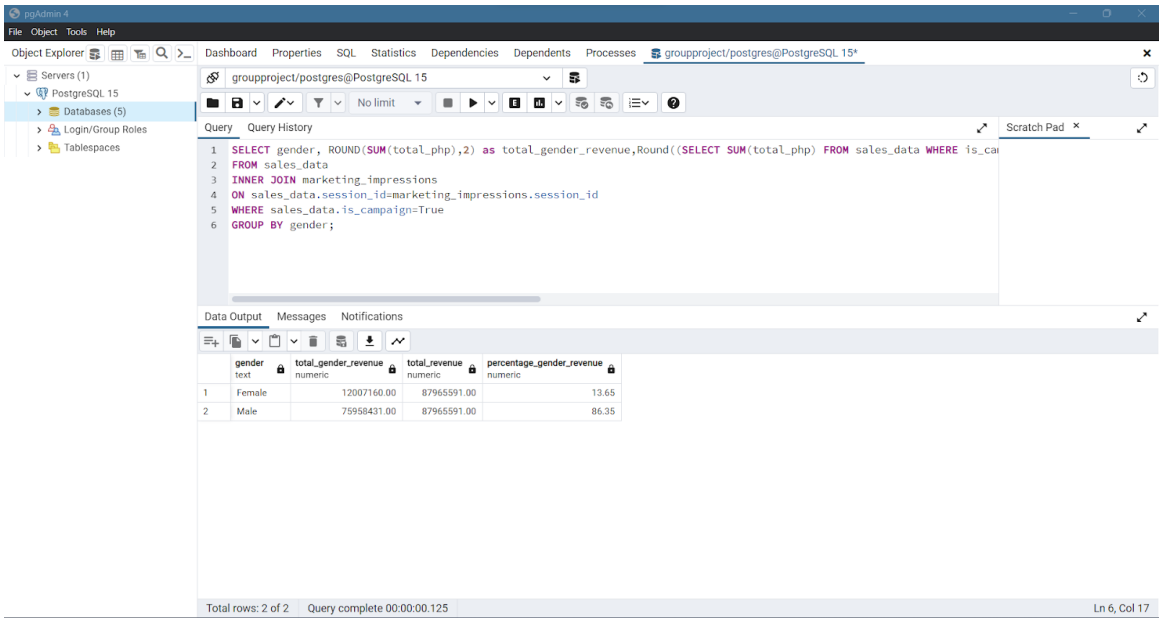


3. Calculate what percentage of the total revenue is contributed by female users during campaign periods.

SQL syntax

```
SELECT gender, ROUND(SUM(total_php),2) as
total_gender_revenue,Round((SELECT SUM(total_php) FROM sales_data WHERE
is_campaign=TRUE),2) AS
total_revenue,Round((Round(SUM(total_php),2)/Round((SELECT
SUM(total_php) FROM sales_data WHERE is_campaign=TRUE),2))*100,2) AS
percentage_gender_revenue
FROM sales_data
INNER JOIN marketing_impressions
ON sales_data.session_id=marketing_impressions.session_id
WHERE sales_data.is_campaign=True
GROUP BY gender;
```

PostgreSQL output

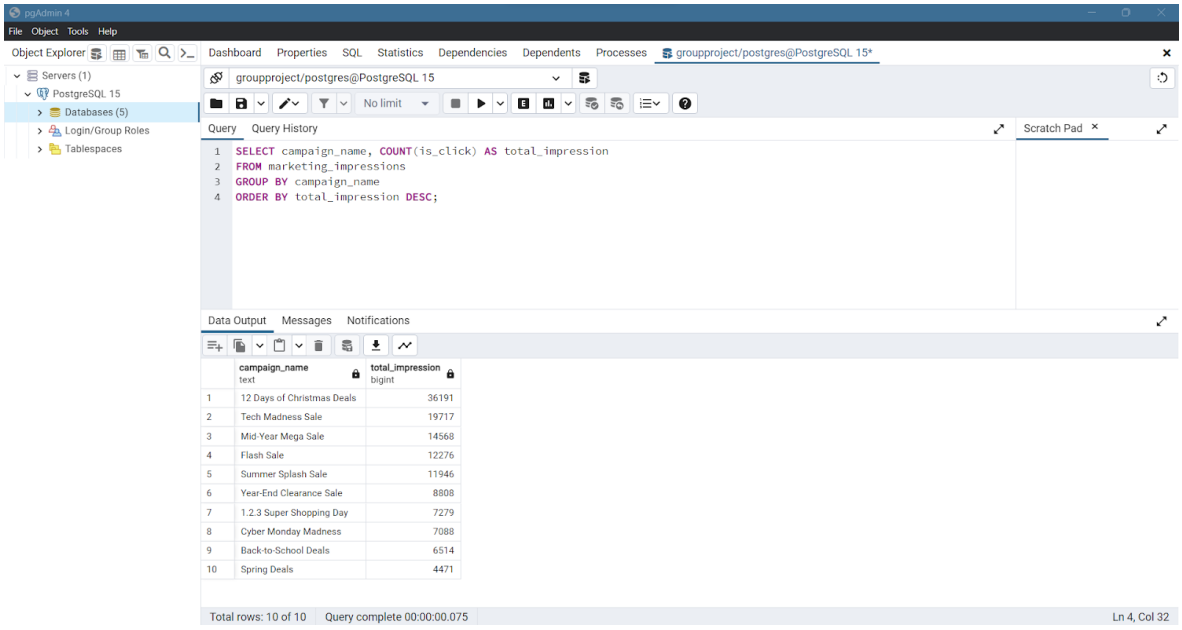


4. Calculate which campaign has generated the most impressions.

SQL syntax

```
SELECT campaign_name, COUNT(is_click) AS total_impression
FROM marketing_impressions
GROUP BY campaign_name
ORDER BY total_impression DESC;
```

PostgreSQL output

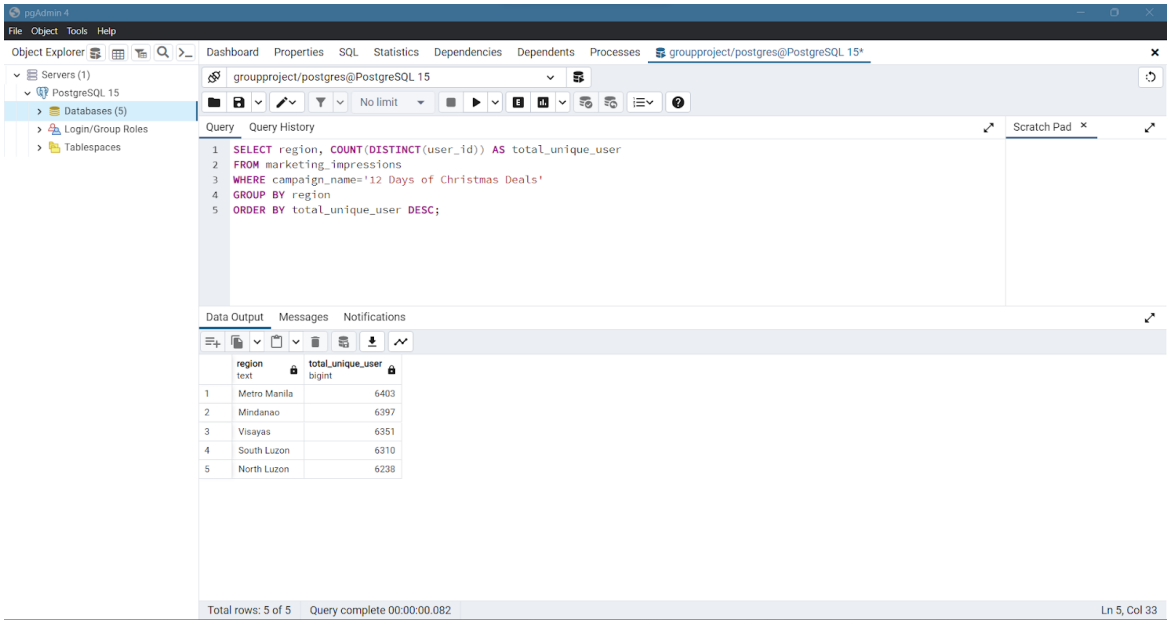


5. Calculate how many unique users per location viewed the campaign with the most impressions.

SQL syntax

```
SELECT region, COUNT(DISTINCT(user_id)) AS total_unique_user
FROM marketing impressions
WHERE campaign name='12 Days of Christmas Deals'
GROUP BY region
ORDER BY total_unique_user DESC;
```

PostgreSQL output



Additional calculations:

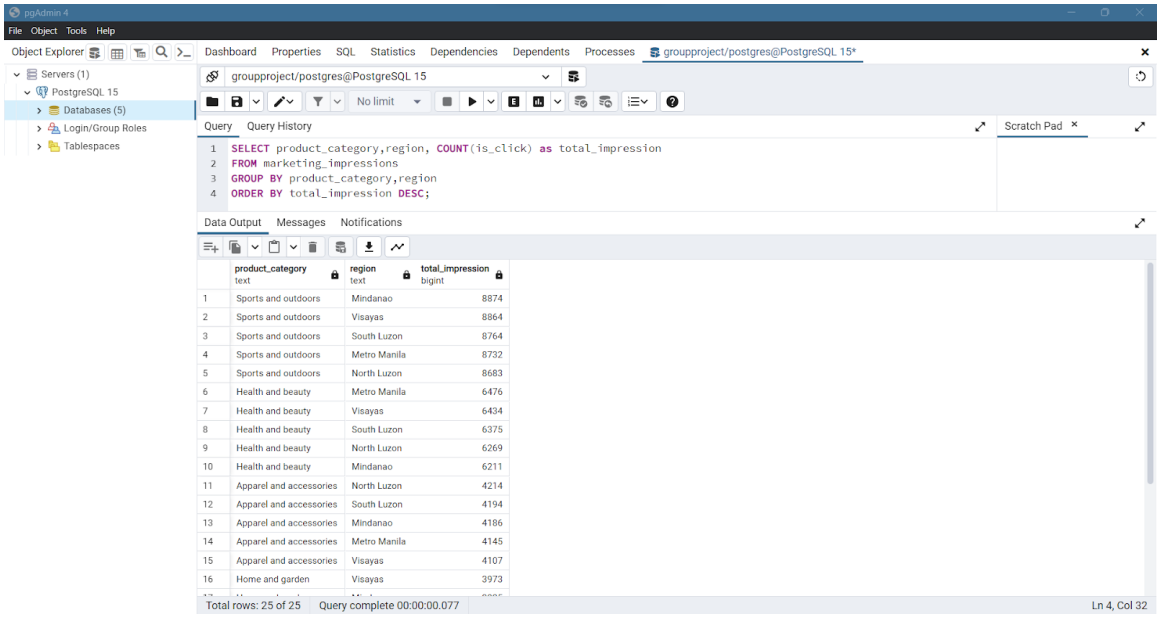
1.) Calculate the popularity of products based on:

a. Location

SQL syntax

```
SELECT product category,region, COUNT(is_click) as total_impression
FROM marketing impressions
GROUP BY product category, region
ORDER BY total_impression DESC;
```

PostgreSQL output

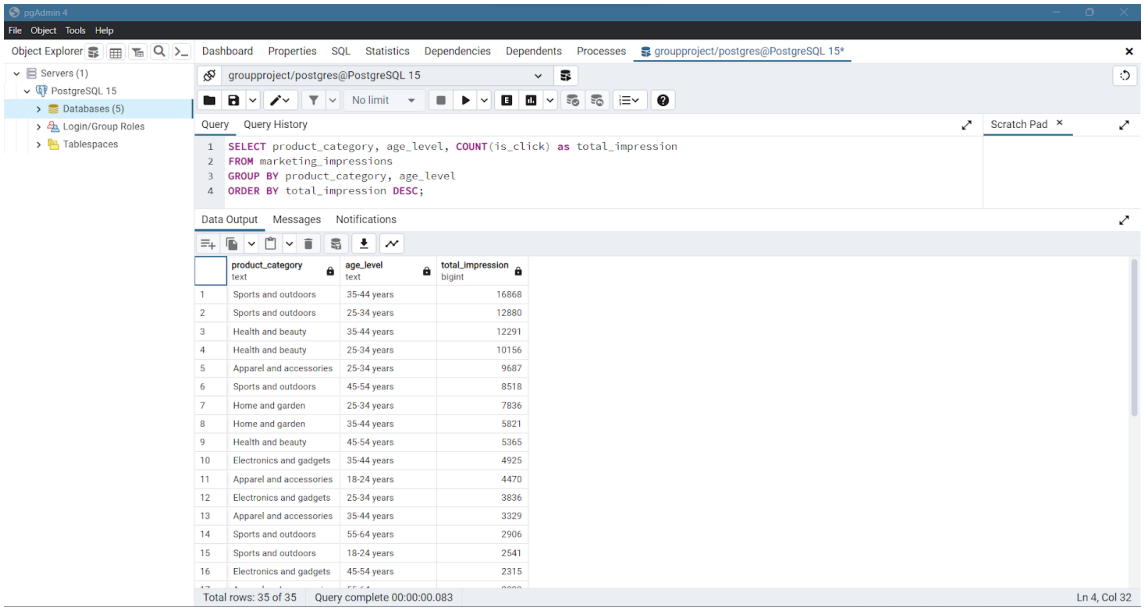


b. Age level

SQL syntax

```
SELECT product category, age_level, COUNT(is_click) as
total_impression
FROM marketing impressions
GROUP BY product_category, age_level
ORDER BY total_impression DESC;
```

PostgreSQL output

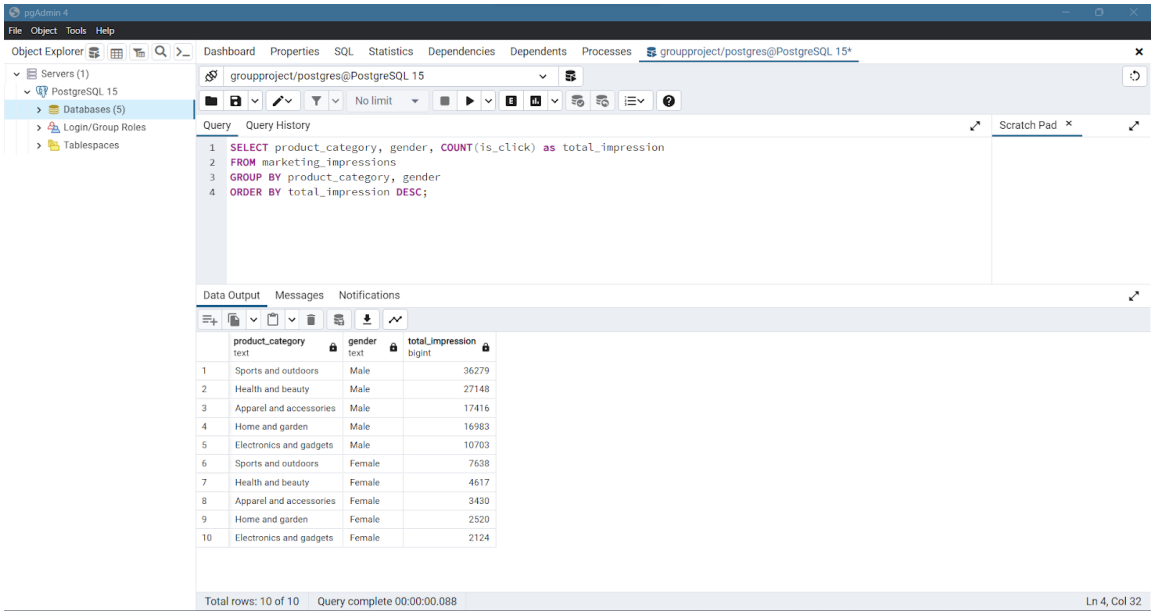


c. Gender

SQL syntax

```
SELECT product_category, gender, COUNT(is_click) as total_impression
FROM marketing_impressions
GROUP BY product_category, gender
ORDER BY total_impression DESC;
```

PostgreSQL output



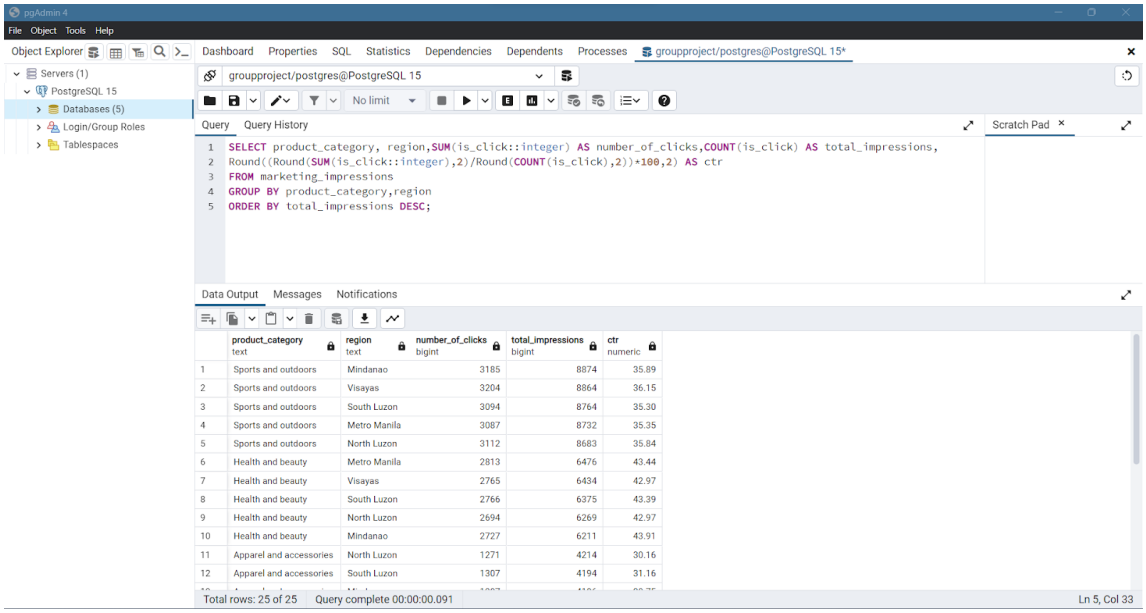
2.) Calculate total impression and CTR of product category by:

a. Location

SQL syntax

```
SELECT product_category, region,SUM(is_click::integer) AS
number_of_clicks,COUNT(is_click) AS total_impressions,
Round((Round(SUM(is_click::integer),2)/Round(COUNT(is_click),2))*100,2) AS ctr
FROM marketing_impressions
GROUP BY product_category,region
ORDER BY total_impressions DESC;
```

PostgreSQL output

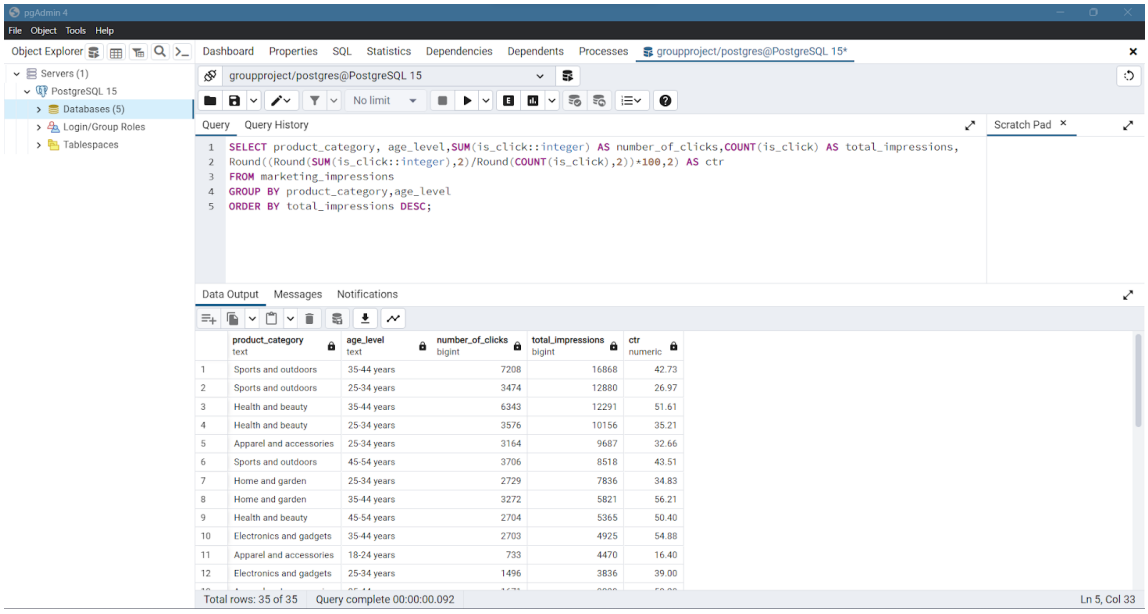


b. Age level

SQL syntax

```
SELECT product_category, age_level,SUM(is_click::integer) AS
number_of_clicks,COUNT(is_click) AS total_impressions,
Round((Round(SUM(is_click::integer),2)/Round(COUNT(is_click),2))*100,2) AS ctr
FROM marketing_impressions
GROUP BY product_category,age_level
ORDER BY total_impressions DESC;
```

PostgreSQL output



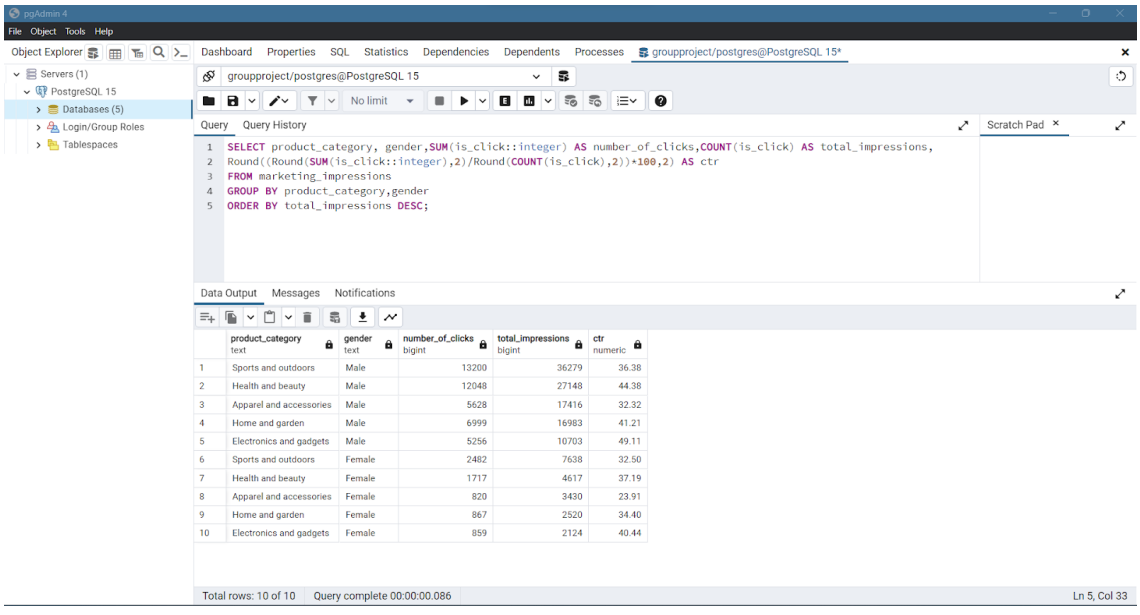
	product_category text	age_level text	number_of_clicks bigint	total_impressions bigint	ctr numeric
1	Sports and outdoors	35-44 years	7208	16868	42.73
2	Sports and outdoors	25-34 years	3474	12880	26.97
3	Health and beauty	35-44 years	6343	12291	51.61
4	Health and beauty	25-34 years	3576	10156	35.21
5	Apparel and accessories	25-34 years	3164	9687	32.66
6	Sports and outdoors	45-54 years	3706	8518	43.51
7	Home and garden	25-34 years	2729	7836	34.83
8	Home and garden	35-44 years	3272	5821	56.21
9	Health and beauty	45-54 years	2704	5365	50.40
10	Electronics and gadgets	35-44 years	2703	4925	54.88
11	Apparel and accessories	18-24 years	733	4470	16.40
12	Electronics and gadgets	25-34 years	1496	3836	39.00

c. Gender

SQL syntax

```
SELECT product_category, gender,SUM(is_click::integer) AS
number_of_clicks,COUNT(is_click) AS total_impressions,
Round((Round(SUM(is_click::integer),2)/Round(COUNT(is_click),2))
*100,2) AS ctr
FROM marketing_impressions
GROUP BY product_category,gender
ORDER BY total_impressions DESC;
```

PostgreSQL output



	product_category text	gender text	number_of_clicks bigint	total_impressions bigint	ctr numeric
1	Sports and outdoors	Male	13200	36279	36.38
2	Health and beauty	Male	12048	27148	44.38
3	Apparel and accessories	Male	5628	17416	32.32
4	Home and garden	Male	6999	16983	41.21
5	Electronics and gadgets	Male	5256	10703	49.11
6	Sports and outdoors	Female	2482	7638	32.50
7	Health and beauty	Female	1717	4617	37.19
8	Apparel and accessories	Female	820	3430	23.91
9	Home and garden	Female	867	2520	34.40
10	Electronics and gadgets	Female	859	2124	40.44

FINDINGS

The overall click-through-rate (CTR) of the campaigns by PopCrt was calculated to be 38.71%. This result is acceptable considering that generally a good CTR is ranging around 3.17% to 6.64% (for search) and 0.46% to 0.57% (for display) as per Google Adwords Benchmark and Datawrapper[2,3]. According to WEbFX, the industry average CTR that is considered good is 1.90% or higher[1]. Therefore, PopCrt digital marketing campaigns are good based on the average industry CTR. However, the effectiveness of these campaigns are not just evaluated by the overall CTR.

The CTR per product category was calculated as shown in figure 1, where the Electronics and gadgets category has the highest CTR of 47.67% and the lowest was 30.93% from the Apparel and accessories category.

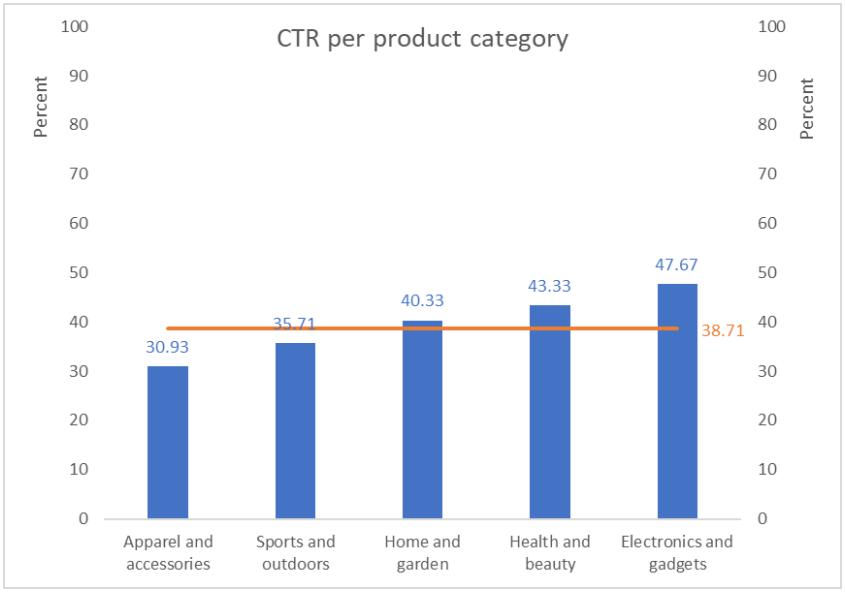


Figure 1. Chart of CTR per product category and the overall CTR

The Apparel and accessories and Sports and outdoors categories are lower than the overall CTR. This cannot conclude anything since we need to look at other factors on why these categories are less than the overall CTR. One factor is the relationship of the CTR to the revenue that is generated.

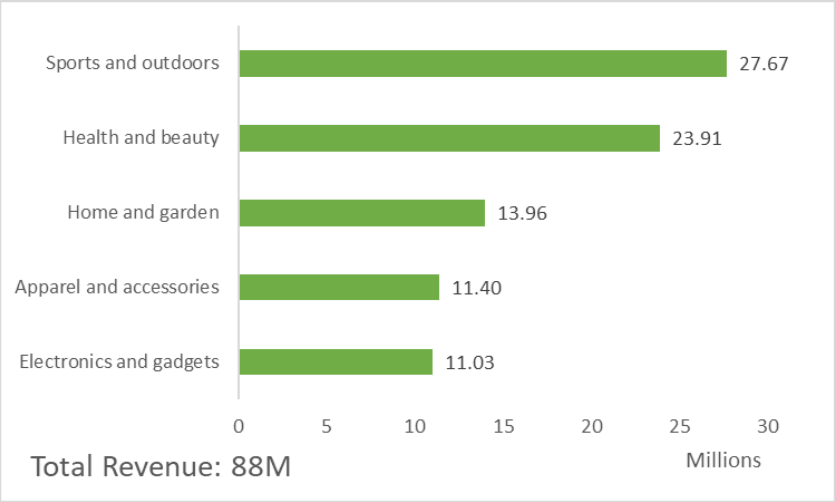


Figure 2 shows the relationship between the CTR and the revenue per product category.

The total revenue recorded was Php 87,965,591.00 during campaign periods. It can be seen in figure 2 that the highest revenue contribution is from the Sports and outdoors and the lowest is from Electronics and gadgets. The Electronics and gadgets category has the highest CTR but has the lowest revenue generation. This shows that this category is popular but does not generate much sales.

The revenue can be further analyzed by looking at its percentage distribution between genders. Figure 3 shows the distribution of revenue between genders during campaign periods. Males have the highest contribution to the total revenue with 86.35% while the female contribution is 13.65%. This shows that the campaigns target mostly the male gender.

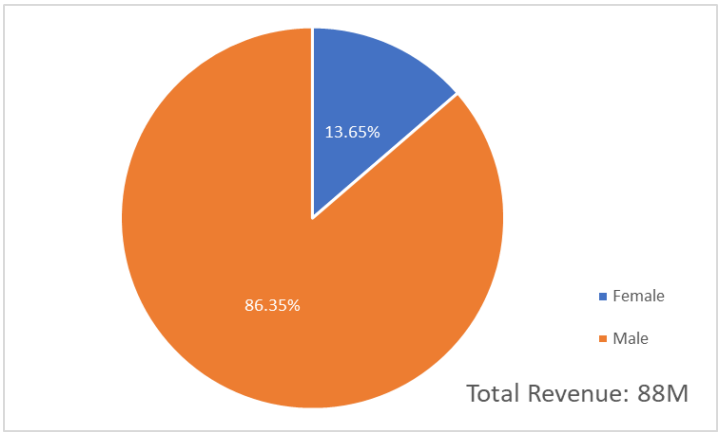


Figure 3. Percentage revenue contribution by gender

To further determine the campaign performance, the total impressions of each campaign was calculated. The 12 Days of Christmas Deals has the highest number of impressions while the Spring Deals is the lowest as shown in figure 4. The 12 Days of Christmas Deals is the most popular campaign with impressions more than double the other campaigns.

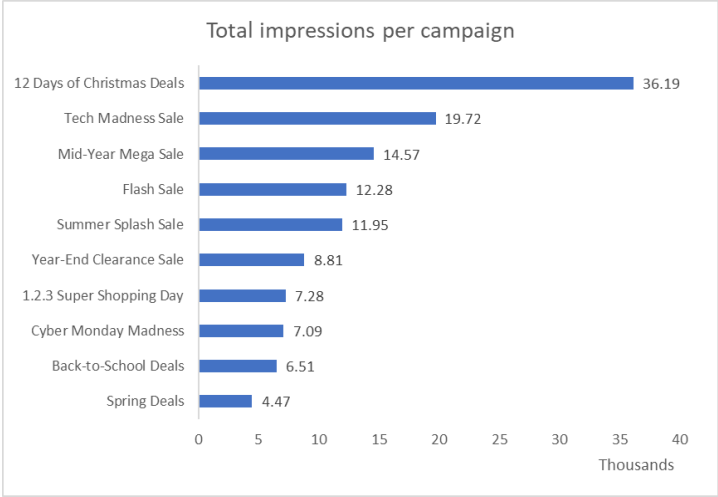


Figure 4. Total impressions of each campaign

To further look into the popularity of the campaign with the highest impression, the unique users per region was determined and plotted in figure 5. It can be seen that the distribution of the number of users is almost equal.

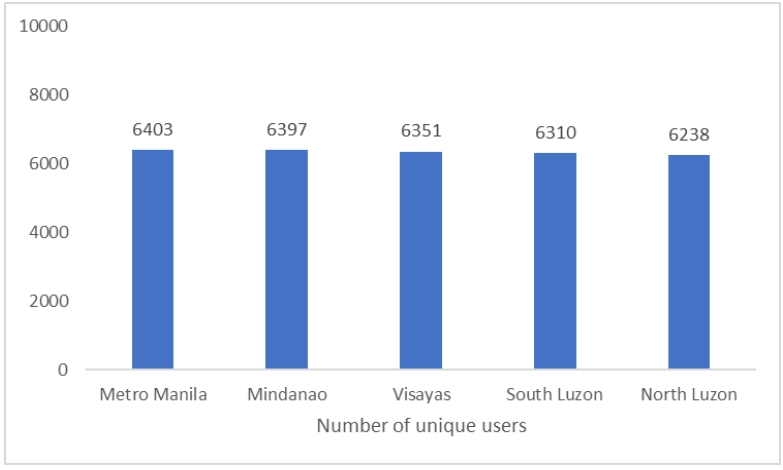


Figure 5. Total unique users who viewed the campaign with most impressions

The popularity of product categories was further explored by computing the total impressions and CTR of product categories by region, age groups, and gender. Total impressions for each user segment is shown below in figures 6, 7, and 8.

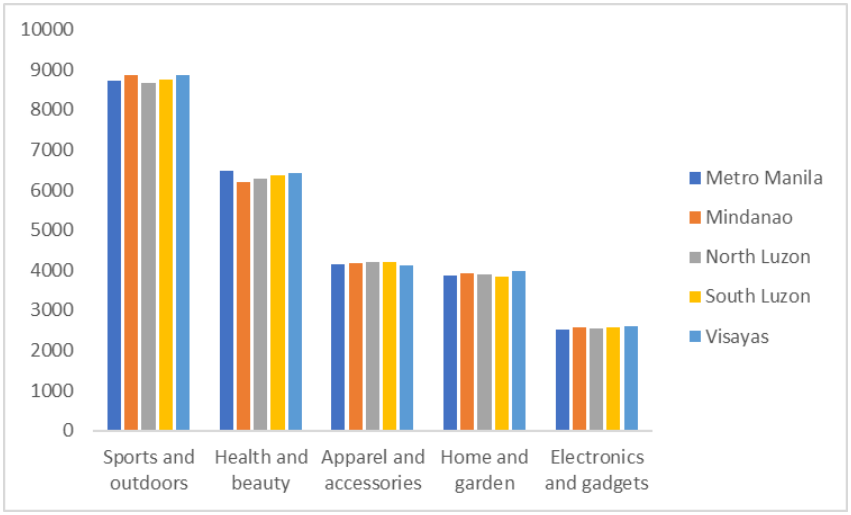


Figure 6. Total impressions of product categories by region

The highest impressions for all the regions is the Sports and outdoors category while the lowest is the Electronics and gadgets category. The distribution of impressions by region can be considered to be almost equal where differences in total impressions by region are at a minimum.

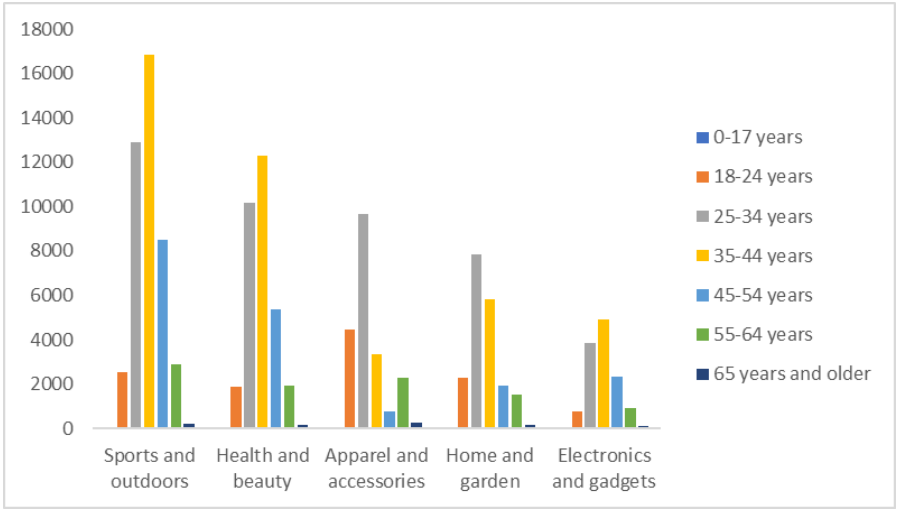


Figure 7. Total impressions of product categories by age group

The highest impressions for all the age groups is the Sports and outdoors category while the lowest is the Electronics and gadgets category. The distribution of impressions by age group is bell shaped symmetric where the age groups of 25-34 years old and 35-44 years old show the highest impressions among all age groups for all the product categories.

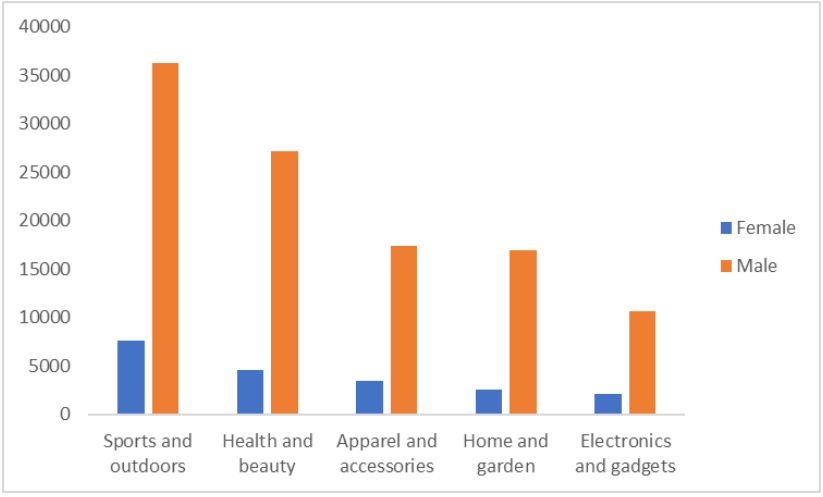


Figure 8. Total impressions of product categories by gender

Similar to both user segments under region and age group, the highest impression is calculated for the Sports and outdoors category while the lowest is the Electronics and gadgets category. The distribution of data shows that the impressions are relatively high for the male gender user segment.

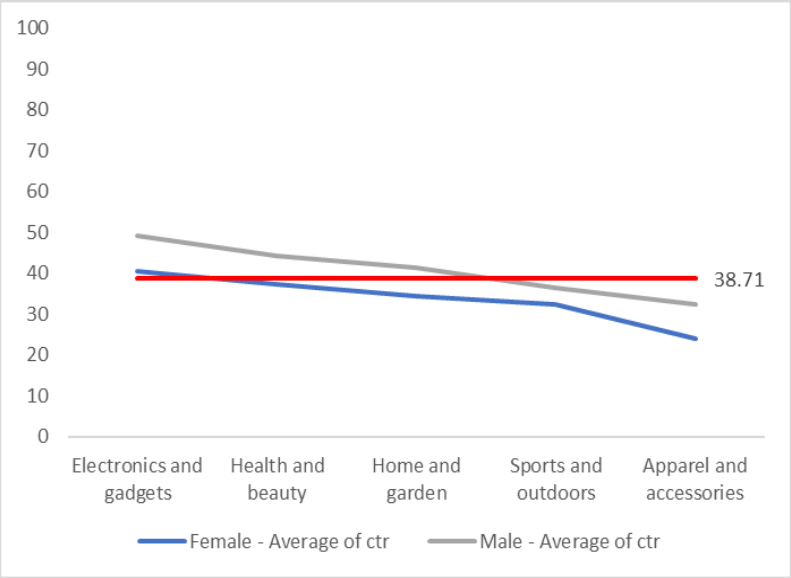


Figure 9. Average CTR compared to overall CTR by gender

Only the Electronics and gadgets category has an average CTR above the overall CTR under the gender user segment.

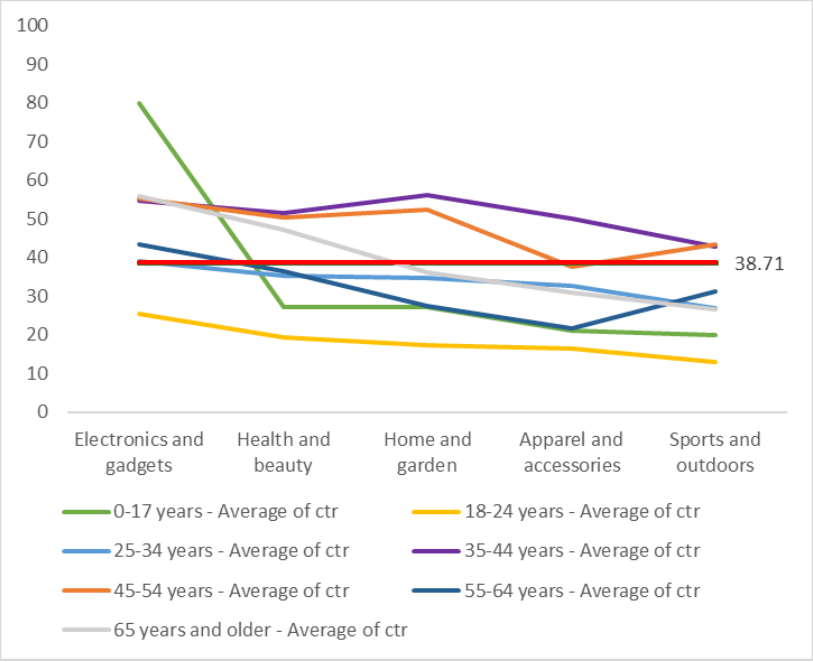


Figure 10. Average CTR compared to overall CTR by age group

The Electronics and gadgets category has the highest average CTR and the Sports and outdoors category has the lowest. For all the age groups, the average CTR's of 35-44 years old and 45-54 years old are those that are generally above the overall CTR.

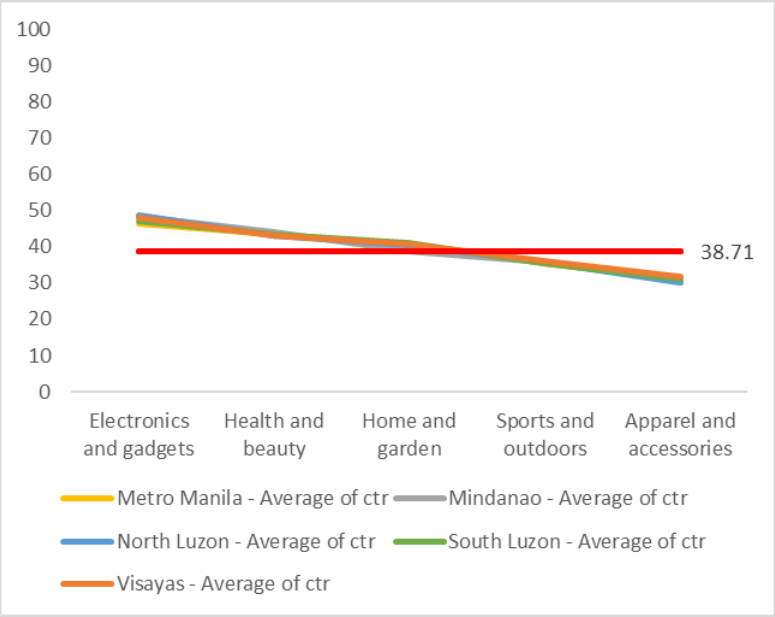


Figure 11. Average CTR compared to overall CTR by region

The Electronics and gadgets category, Health and beauty category and the Home and garden have average CTR's above the overall CTR under the regional user segment.

CONCLUSIONS

Product popularity

1. PopCrt digital marketing campaigns have accumulated an overall click-through rate of 38.71% which is good as per average industry CTR.
2. The Electronics and gadgets category has the highest CTR 47.67% of but has the lowest revenue.
3. Highest revenue is generated from the Sports and outdoors category even though it has a CTR of 35.71% which is lower than the overall CTR of 38.71%.
4. The 25-34 year old age group is the most engaged when it comes to all product categories but the CTR is lower than the overall CTR.

Campaign performance

1. In terms of gender, males are the highest contributor to revenue. Thus, the campaigns generally target the male audience. Females only have a 13.65% share in the revenues during campaign periods.
2. In terms of campaign performance, the 12 Days of Christmas Deals campaign is the most popular.

Location-based engagement

1. Based on the distribution of unique users and total impressions per product category by region, campaigns are effective in terms of location and have a nationwide reach.

RECOMMENDATIONS

Product popularity

1. Focus campaigns for Electronics and gadgets category since this is the most popular product but generates the least revenue.
2. Focus on increasing the CTR for the 25-34 year old age group to capitalize in their engagements in all product categories.

Campaign performance

1. Create campaigns that will engage the female audience by advertising products for women in order to increase their share in revenue.

Location-based engagement

1. Since campaigns are effective in reaching nationwide audiences, a campaign boost is needed to increase users per location.
2. Collaborate with local influencers or content creators with a strong presence in your target location. This will promote products or services to the local audience through content, review or giveaways.
3. Try Customer Referral Programs to encourage existing customers to refer their friends and family from different locations.
4. Implement location-specific referral programs to incentivize referrals from specific geographic areas.

Suggested marketing strategies

1. Optimize Low-CTR Category (Apparel and accessories)
    - Improve creativity in advertisements by enhancing visual elements, messages and call-to-action statements such as "if not satisfied, money back guarantee".
    - Refine target audience to female users
    - Experiment with different ad formats to generate higher engagements
    - Optimize ad placement by adjusting search engine results

2. Capitalize on High-CTR Category (Electronics and gadgets)
    - Increase advertising budget for electronics and gadgets to capitalize on its high CTR
    - Improve design, content, and user experience in landing pages
    - Expand reach to a wider audience (other than 0-17 years old)

REFERENCES

1. Storm, M. (n.d.). *What's a Good Click-through Rate (CTR) for Your Industry?* Web FX Digital Marketing That Drives Revenue. Retrieved June 27, 2023, from https://www.webfx.com/blog/marketing/whats-good-click-rate-ctr-industry/
2. Irvine, M. (2023, May 30). *Google Ads Benchmarks for YOUR Industry [Updated!]*. WordStream by LOCALiQ. Retrieved June 27, 2023, from https://www.wordstream.com/blog/ws/2016/02/29/google-adwords-industry-benchmarks
3. (n.d.). *What is a "Good" Click-Through Rate? Click-Through Rate Benchmarks*. CXL. Retrieved June 27, 2023, from https://cxl.com/guides/click-through-rate/benchmarks/