

DATA-DRIVEN INSIGHTS FOR MARKETING & INVESTOR METRICS

Instagram User Analytics

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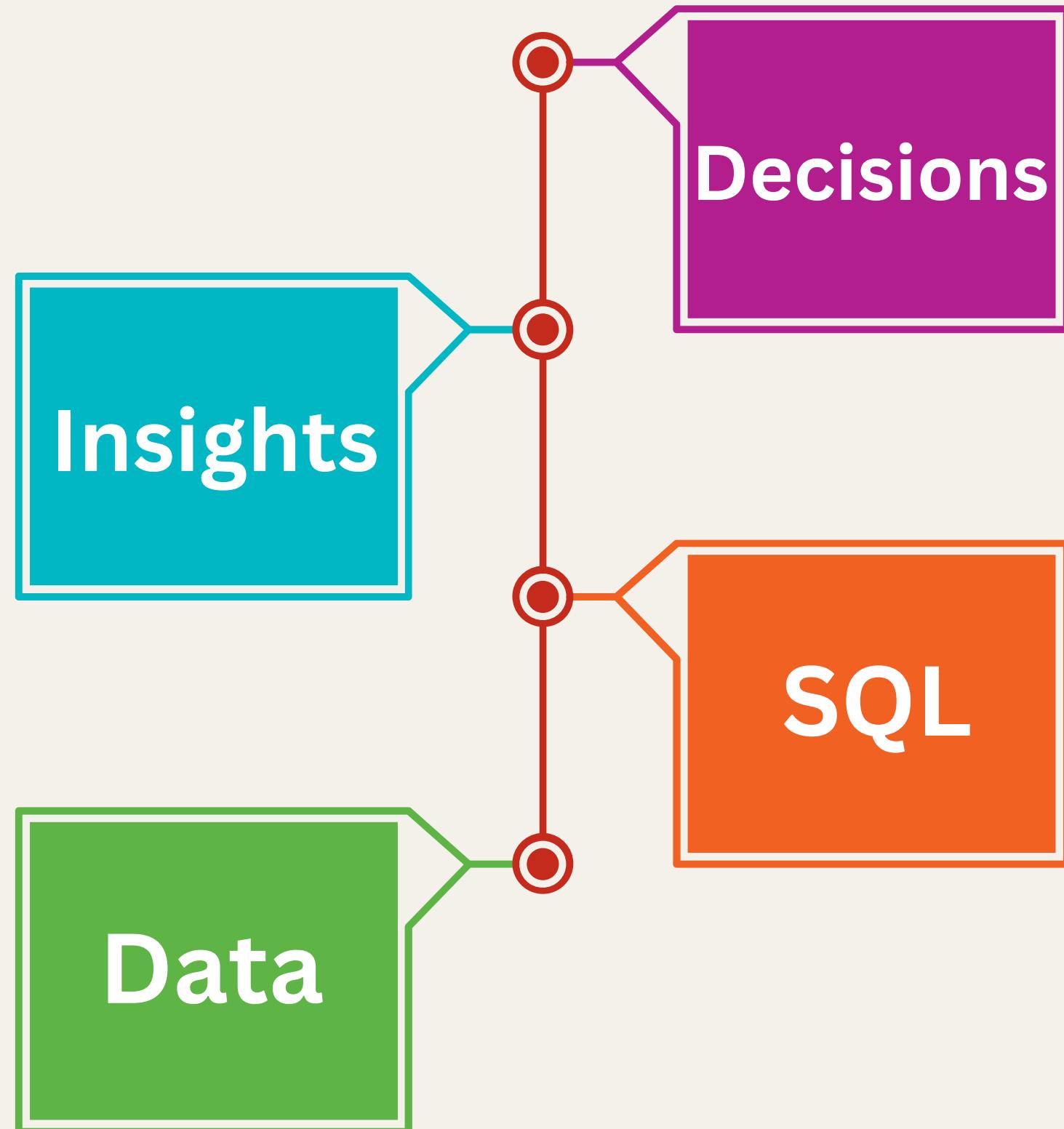
Project Overview

This project aims to analyze Instagram user data using SQL to extract meaningful insights that can help:

- **Marketing teams** optimize campaigns and user engagement.
- **Product teams** better understand user behavior and make data-driven feature improvements.
- **Investors** assess user engagement trends, platform growth, and potential risks such as fraudulent activity.

Approach

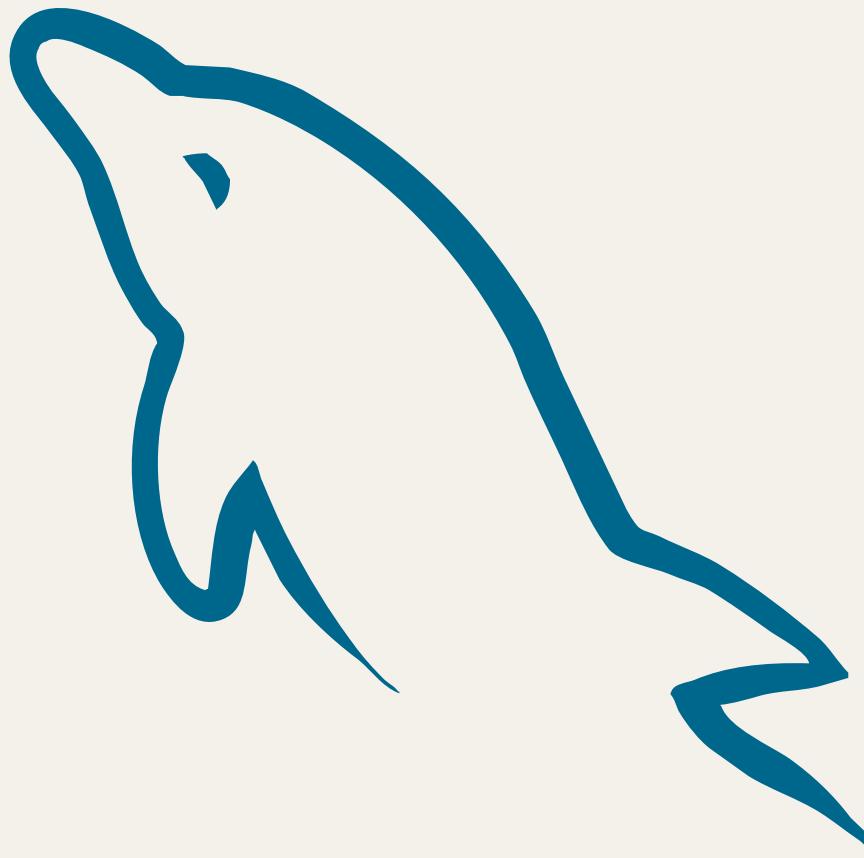
- The database was first explored to understand the table structures, relationships, and key attributes. Next, the requirements for marketing and investor analysis were reviewed to determine the necessary queries for extracting relevant insights.
- Using SQL functions like JOINs, subqueries, aggregation, and window functions, queries were executed to identify loyal and inactive users, contest winners, hashtag trends, ad campaign timing, and bot detection.
- Finally, the results were interpreted and visualized using charts and graphs, ensuring clear and actionable insights.



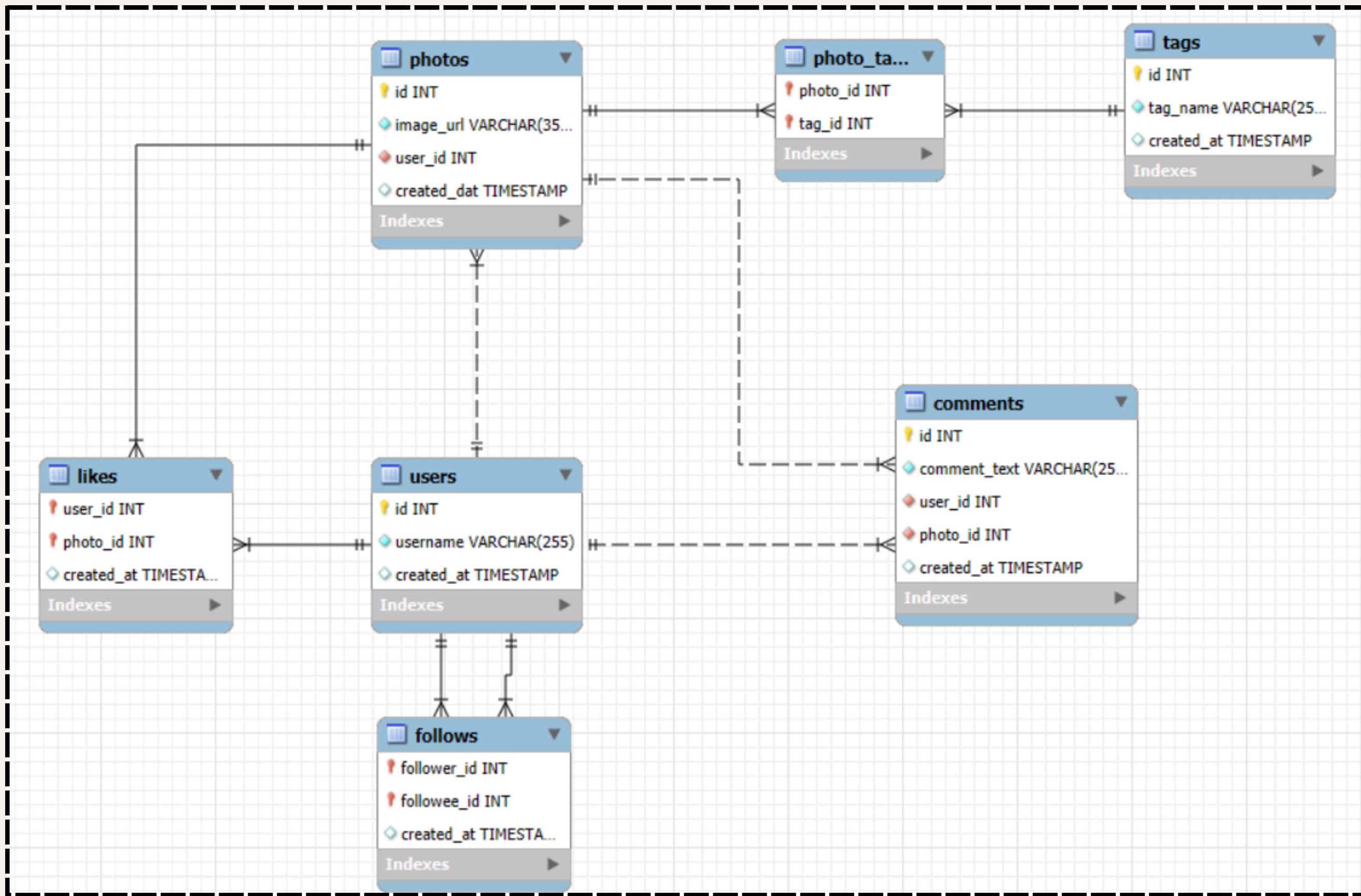
Tech Stack



- ◆ **DATABASE:** MYSQL WORKBENCH 8.0 CE
- ◆ **QUERY LANGUAGE:** SQL
- ◆ **PRESENTATION TOOL:** CANVA



Database Schema



Top 5 Most Loyal Users

Users with the longest-standing accounts—ideal candidates for loyalty rewards.

```
SELECT *  
FROM users  
ORDER BY created_at ASC  
LIMIT 5;
```

80	Darby_Herzog
67	Emilio_Bernier52
63	Elenor88
95	Nicole71
38	Jordyn.Jacobson2

Users Who Never Posted

Encouraging inactive users = better engagement.

```
SELECT u.id, u.username  
FROM users u  
LEFT JOIN photos p ON u.id =  
p.user_id  
WHERE p.id IS NULL;
```

ID	Username	ID	Username
5	Aniya_Hackett	57	Julien_Schmidt
7	Kassandra_Homenick	66	Mike.Auer39
14	Jaclyn81	68	Franco_Keebler64
21	Rocio33	71	Nia_Haag
24	Maxwell.Halvorson	74	Hulda.Macejkovic
25	Tierra.Trantow	75	Leslie67
34	Pearl7	76	Janelle.Nikolaus81
36	Ollie_Ledner37	80	Darby_Herzog
41	Mckenna17	81	Esther.Zulauf61
45	David.Osinski47	83	Bartholome.Bernhard
49	Morgan.Kassulke	89	Jessyca_West
53	Linnea59	90	Esmeralda.Mraz57
54	Duane60	91	Bethany20

Most Liked Photo

User with the highest likes on a single photo.

```
WITH most_liked_photo AS(  
    SELECT photo_id, COUNT(user_id) AS no_of_likes  
    FROM likes  
    GROUP BY photo_id)  
  
SELECT u.id, u.username, p.id AS photo_id, mlp.no_of_likes  
FROM users u  
JOIN photos p ON u.id = p.user_id  
JOIN most_liked_photo mlp ON p.id = mlp.photo_id  
WHERE mlp.no_of_likes = (SELECT MAX(no_of_likes) FROM  
most_liked_photo);
```

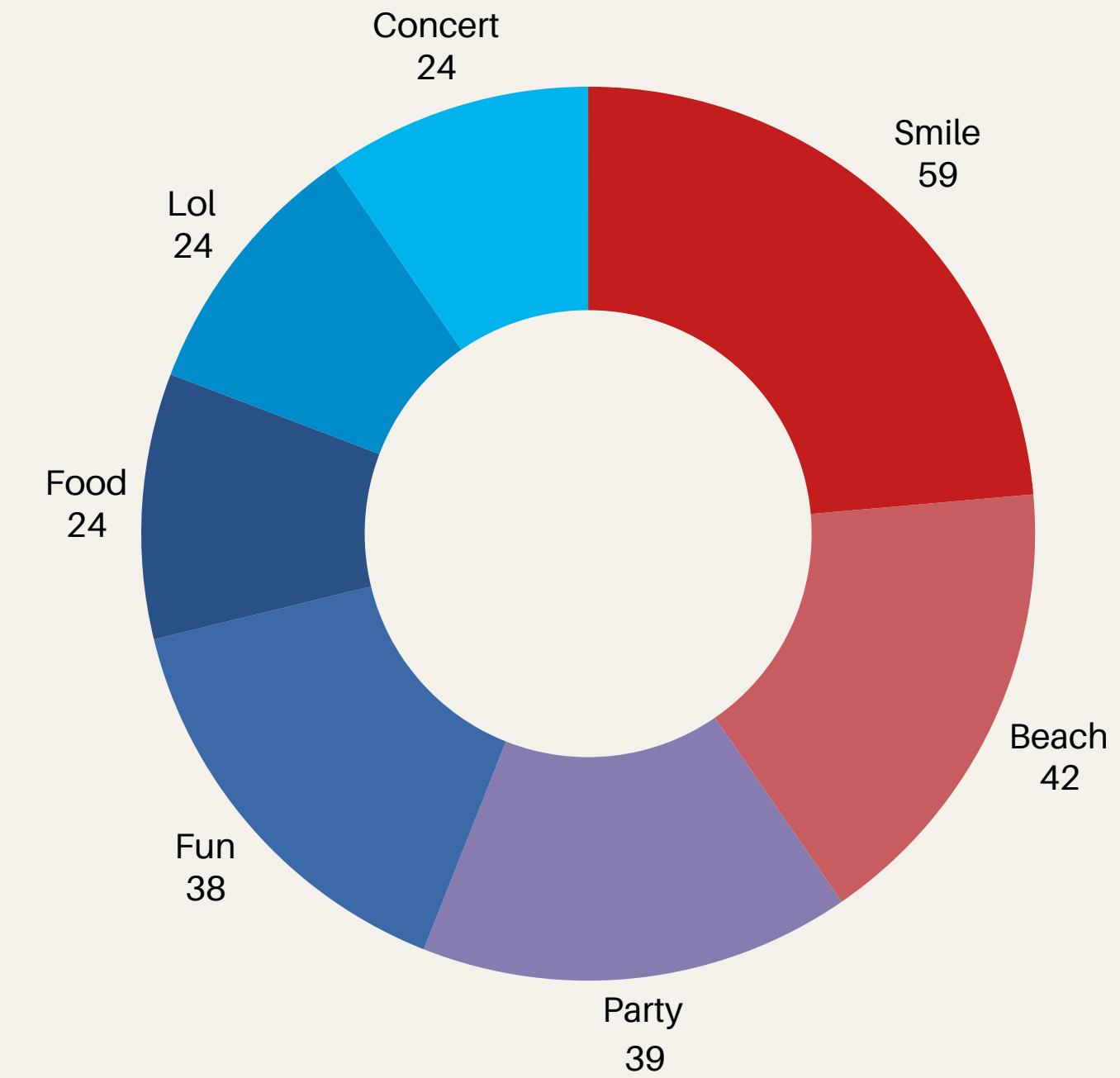
 **Zack_Kemmer93** 
User_id = 52
Photo_id = 145
no_of_likes = 48

Top 5 Trending Hashtags

Unlocking the potential of trending hashtags to enhance your brand's visibility!

```
WITH ranked_tags AS (
    SELECT tag_id,
        COUNT(tag_id) AS tag_usage,
        DENSE_RANK() OVER (ORDER BY COUNT(tag_id) DESC) AS Rnk
    FROM photo_tags
    GROUP BY tag_id)

SELECT t.id, t.tag_name, rt.tag_usage FROM tags t
JOIN ranked_tags rt ON t.id = rt.tag_id
WHERE rt.rnk <= 5
ORDER BY rt.tag_usage DESC;
```



Peak User Registration Day

Finding the weekday with the highest user registrations for targeted ad campaigns.

```
WITH registration_counts AS (
    SELECT DAYNAME(created_at) AS day_of_week, COUNT(*) AS
no_of_registrations
    FROM users
    GROUP BY day_of_week
)
SELECT day_of_week, no_of_registrations
    FROM registration_counts
    WHERE no_of_registrations = (SELECT MAX(no_of_registrations)
    FROM registration_counts);
```



How Active Are Users?

User Engagement: Average posts per user

```
-- Join-based approach:  
(COUNT(p.id) / COUNT(DISTINCT u.id)) AS  
avg_posts_per_user  
FROM users u  
LEFT JOIN photos p ON u.id = p.user_id;  
  
-- Direct approach:  
SELECT  
(SELECT COUNT(*) FROM photos) / (SELECT COUNT(*)  
FROM users) AS avg_posts_per_user;
```



Total Photos = 257

÷

Total Users = 100

=

Average = 2.57

The diagram shows a hand-drawn style calculation. It starts with 'Total Photos' followed by an equals sign and '257'. Below it is a division symbol (÷). Then it says 'Total Users' followed by an equals sign and '100'. Below that is another division symbol (÷). Finally, it says 'Average' followed by an equals sign and '2.57'.

Detecting Fake Accounts

Users who liked every single photo—potential bots.

```
SELECT l.user_id, u.username  
FROM likes l  
JOIN users u ON u.id = l.user_id  
GROUP BY l.user_id  
HAVING COUNT(*) = (SELECT COUNT(*)  
FROM photos);
```

ID	Username
5	Aniya_Hackett
14	Jaclyn81
21	Rocio33
24	Maxwell.Halvorson
36	Ollie_Ledner37
41	Mckenna17
54	Duane60
57	Julien_Schmidt
66	Mike.Auer39
71	Nia_Haag
75	Leslie67
76	Janelle.Nikolaus81
91	Bethany20

Insights & Takeaways

◆ Trending Hashtags Go Beyond the Top 5

While the goal was to find the top 5 most-used hashtags, the results revealed 8 popular hashtags due to a tie at the fifth position (Food, Lol, and Concert – each used 24 times). This suggests that certain hashtags are used at the same frequency, highlighting competition in trending topics.

◆ Thursdays & Sundays See the Most User Sign-Ups

User registrations peak on *Thursdays* and *Sundays*, making them the best days for marketing campaigns and feature launches.

◆ User Engagement Is Steady but Has Room for Growth

With an average of 2.57 posts per user, engagement is consistent, but encouraging content challenges and personalized recommendations could drive more activity.

Thank you