# Instagram User Analytics

User analysis is the process by which we track how users engage and interact with our digital product (software or mobile application) to derive business insights for marketing, product & development teams.
These insights are then used by teams across the business to launch a new marketing campaign, decide on features to build for an app, track the success of the app by measuring user engagement and improve the experience altogether while helping the business grow.

The objective of this project is to analyze and extract valuable business insights to assist the marketing team and Investors in making appropriate decisions. With access to a robust dataset and using MySQL queries in DB-Fiddle, I have been able to derive solutions which will benefit the development of the Instagram application.

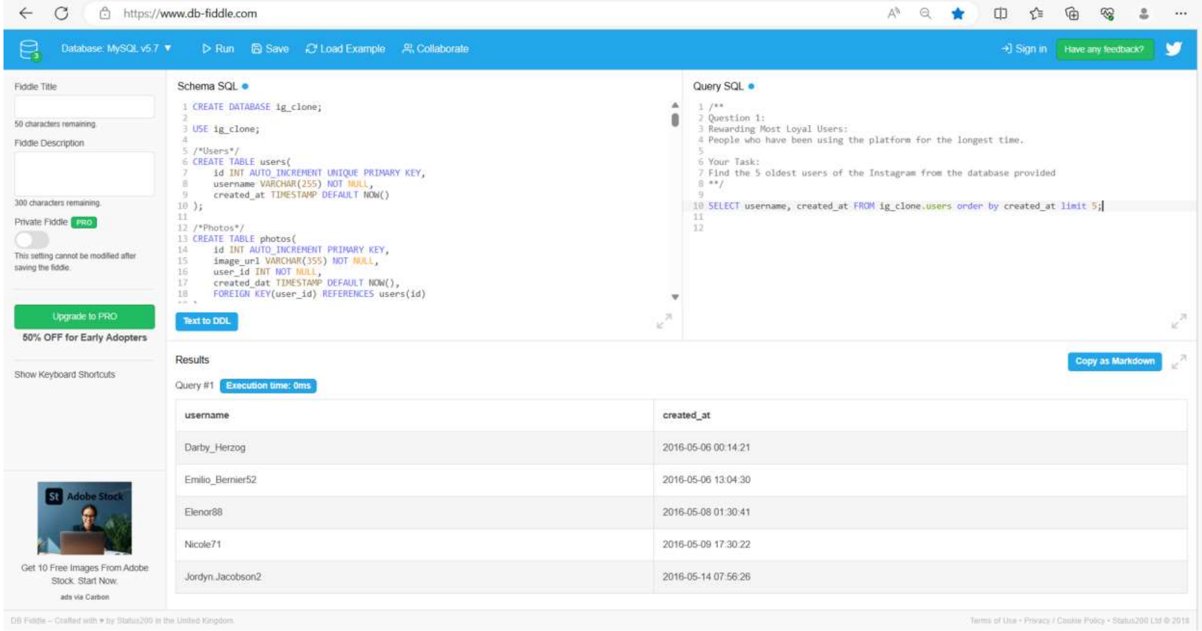
I have used MySQL version 5.7 of DB-Fiddle **(** **https://www.db-fiddle.com/** **)** for making this project as it's a free online SQL Database environment.

## Questions by Marketing team:

The marketing team wants to launch some campaigns, and they need our help to reward most loyal users, remind inactive users to start posting, declare a contest where the user who gets the most likes on a single photo wins. Also, a partner brand wants to know which hashtags to use in the post to reach the most people on the platform, and which day would be the best day to launch Ad Campaigns.

**1: Reward most Loyal Users**: People who have been using the platform for the longest time.

Using DRL- SELECT command and ORDER BY clause, I have found the 5 oldest users of Instagram from the dataset provided. Refer to the image below which shows the query and result found.


https://www.db-fiddle.com
Database: MySQL v5.7 ▼
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Schema SQL

```
CREATE DATABASE ig_clone;

USE ig_clone;

/*Users*/
CREATE TABLE users(
    id INT AUTO_INCREMENT UNIQUE PRIMARY KEY,
    username VARCHAR(255) NOT NULL,
    created_at TIMESTAMP DEFAULT NOW()
);

/*Photos*/
CREATE TABLE photos(
    id INT AUTO_INCREMENT PRIMARY KEY,
    image_url VARCHAR(355) NOT NULL,
    user_id INT NOT NULL,
    created_dat TIMESTAMP DEFAULT NOW(),
    FOREIGN KEY(user_id) REFERENCES users(id)
```

Query SQL

```
/**
Question 1:
Rewarding Most Loyal Users:
People who have been using the platform for the longest time.

Your Task:
Find the 5 oldest users of the Instagram from the database provided
**/

SELECT username, created_at FROM ig_clone.users order by created_at limit 5;
```

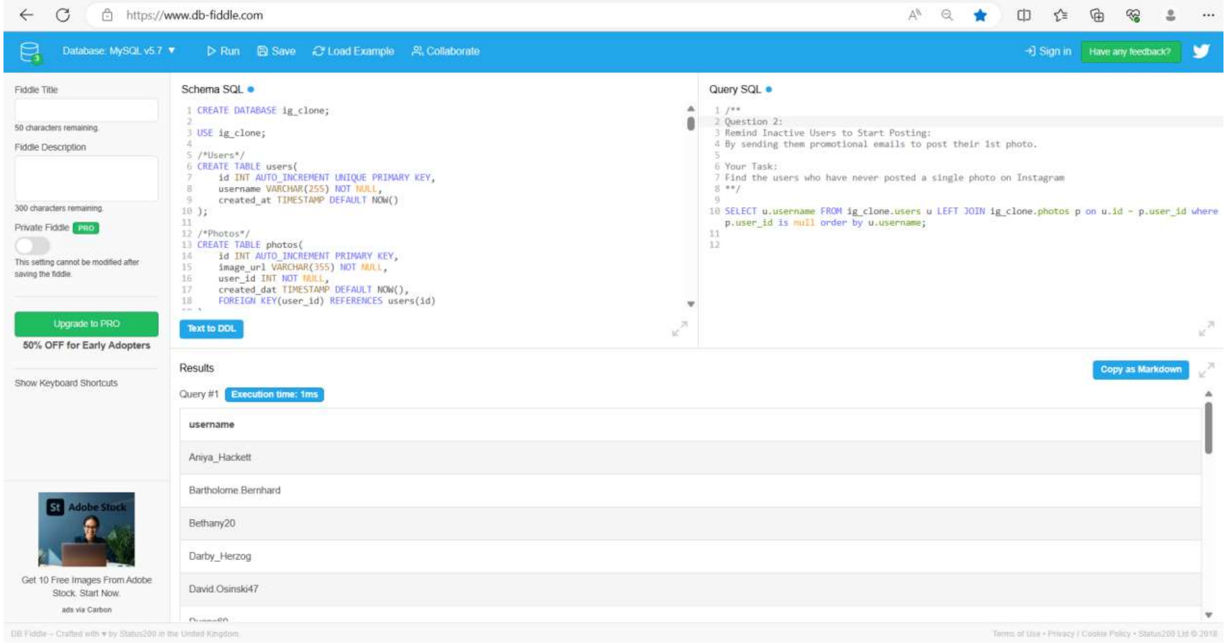
Results

Query #1 Execution time: 0ms

| username | created_at |
|---|---|
| Darby_Herzog | 2016-05-06 00:14:21 |
| Emilio_Bernier52 | 2016-05-06 13:04:30 |
| Elenor88 | 2016-05-08 01:30:41 |
| Nicole71 | 2016-05-09 17:30:22 |
| Jordyn.Jacobson2 | 2016-05-14 07:56:26 |

**2: Remind Inactive Users to Start Posting**: By sending them promotional emails to post their 1st photo.

Using LEFT JOIN, WHERE & ORDER BY clauses, I have found the users who have never posted a single photo on Instagram. Refer to the image below which shows the query and result found.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    image_url VARCHAR(355) NOT NULL,
    user_id INT NOT NULL,
    created_dat TIMESTAMP DEFAULT NOW(),
    FOREIGN KEY(user_id) REFERENCES users(id)
```

Query SQL

```
/**
Question 2:
Remind Inactive Users to Start Posting:
By sending them promotional emails to post their 1st photo.

Your Task:
Find the users who have never posted a single photo on Instagram
**/

SELECT u.username FROM ig_clone.users u LEFT JOIN ig_clone.photos p on u.id = p.user_id where
p.user_id is null order by u.username;
```

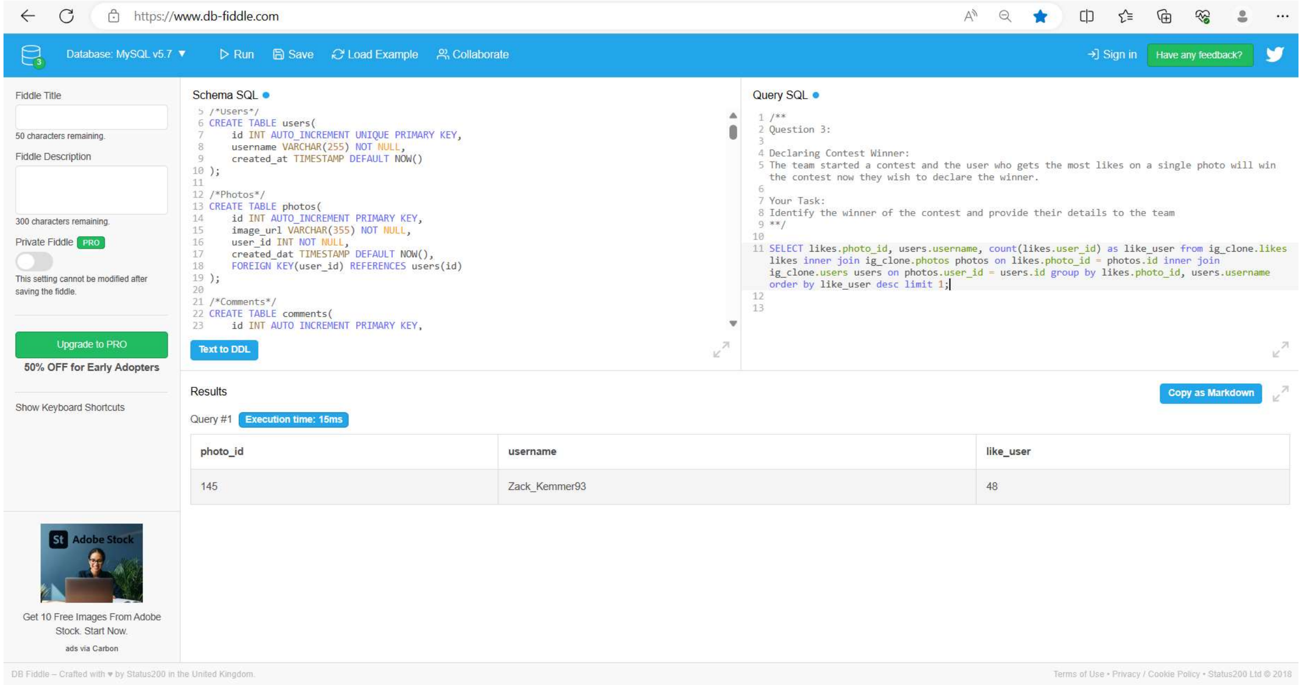
Results

Query #1 Execution time: 1ms

| username |
|---|
| Aniya_Hackett |
| Bartholome.Bernhard |
| Bethany20 |
| Darby_Herzog |
| David.Osinski47 |
| Duane60 |

**3: Declaring Contest Winner**: The team started a contest and the user who gets the most likes on a single photo will win the contest now they wish to declare the winner.

Hence, using COUNT function, INNER JOIN and GROUP BY & ORDER BY clauses, found the winner of the contest. Refer to the image below which shows the query and result found.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Schema SQL

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);

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CREATE TABLE photos(
    id INT AUTO_INCREMENT PRIMARY KEY,
    image_url VARCHAR(355) NOT NULL,
    user_id INT NOT NULL,
    created_dat TIMESTAMP DEFAULT NOW(),
    FOREIGN KEY(user_id) REFERENCES users(id)
);

/*Comments*/
CREATE TABLE comments(
    id INT AUTO_INCREMENT PRIMARY KEY,
```

Query SQL

```sql
/**
Question 3:

Declaring Contest Winner:
The team started a contest and the user who gets the most likes on a single photo will win
the contest now they wish to declare the winner.

Your Task:
Identify the winner of the contest and provide their details to the team
**/

SELECT likes.photo_id, users.username, count(likes.user_id) as like_user from ig_clone.likes
likes inner join ig_clone.photos photos on likes.photo_id = photos.id inner join
ig_clone.users users on photos.user_id = users.id group by likes.photo_id, users.username
order by like_user desc limit 1;
```

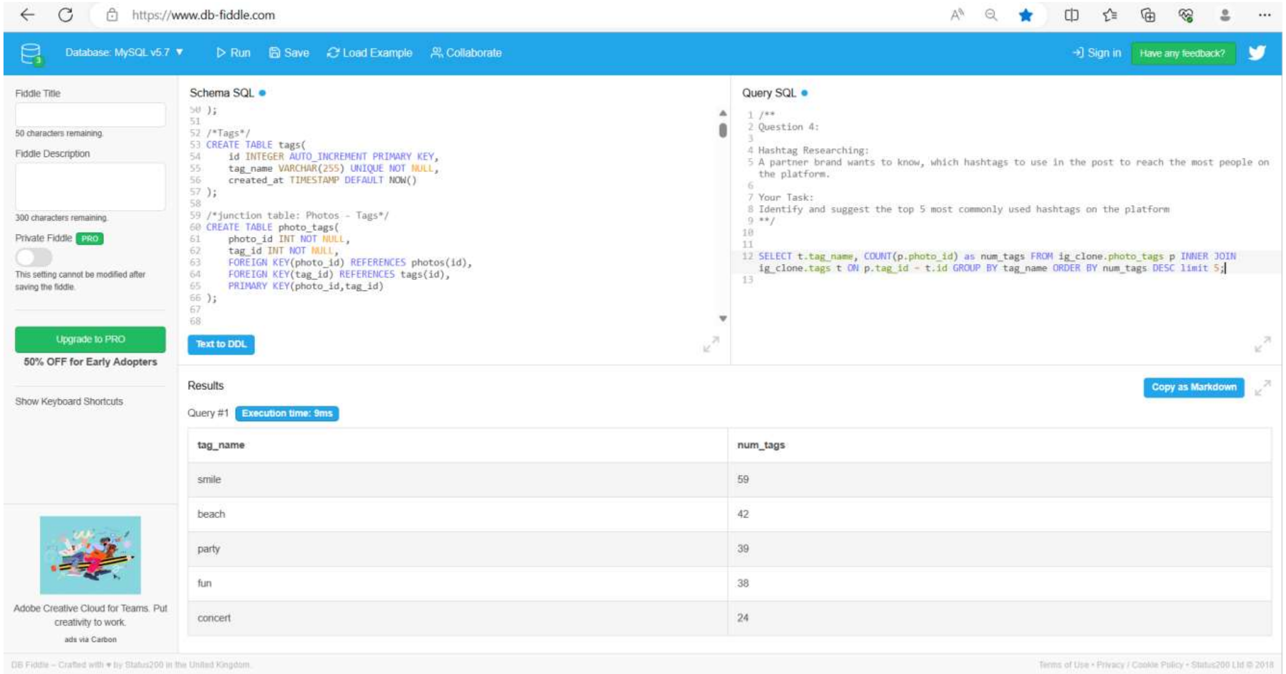
Results

Query #1 Execution time: 15ms

| photo_id | username | like_user |
|---|---|---|
| 145 | Zack_Kemmer93 | 48 |

**4: Hashtag Researching:** A partner brand wants to know which hashtags to use in the post to reach the most people on the platform.

Using COUNT function, INNER JOIN and GROUP BY & ORDER BY clauses, I have found the top 5 most used hashtags on the platform. Refer to the image below which shows the query and result found.



https://www.db-fiddle.com
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Results
Query #1
Execution time: 9ms
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```
);

/*Tags*/
CREATE TABLE tags(
    id INTEGER AUTO_INCREMENT PRIMARY KEY,
    tag_name VARCHAR(255) UNIQUE NOT NULL,
    created_at TIMESTAMP DEFAULT NOW()
);

/*junction table: Photos - Tags*/
CREATE TABLE photo_tags(
    photo_id INT NOT NULL,
    tag_id INT NOT NULL,
    FOREIGN KEY(photo_id) REFERENCES photos(id),
    FOREIGN KEY(tag_id) REFERENCES tags(id),
    PRIMARY KEY(photo_id,tag_id)
);

```

```
/**
Question 4:

Hashtag Researching:
A partner brand wants to know, which hashtags to use in the post to reach the most people on the platform.

Your Task:
Identify and suggest the top 5 most commonly used hashtags on the platform
**/


SELECT t.tag_name, COUNT(p.photo_id) as num_tags FROM ig_clone.photo_tags p INNER JOIN ig_clone.tags t ON p.tag_id = t.id GROUP BY tag_name ORDER BY num_tags DESC limit 5;
```

| tag_name | num_tags |
|---|---|
| smile | 59 |
| beach | 42 |
| party | 39 |
| fun | 38 |
| concert | 24 |

**5: Launch AD Campaign:** The team wants to know which day would be the best day to launch ADs.

Using COUNT function and GROUP BY & ORDER BY clauses, I have found the days on which most users register on. Here, weekday number are as follow:

0- Monday

1- Tuesday

2- Wednesday

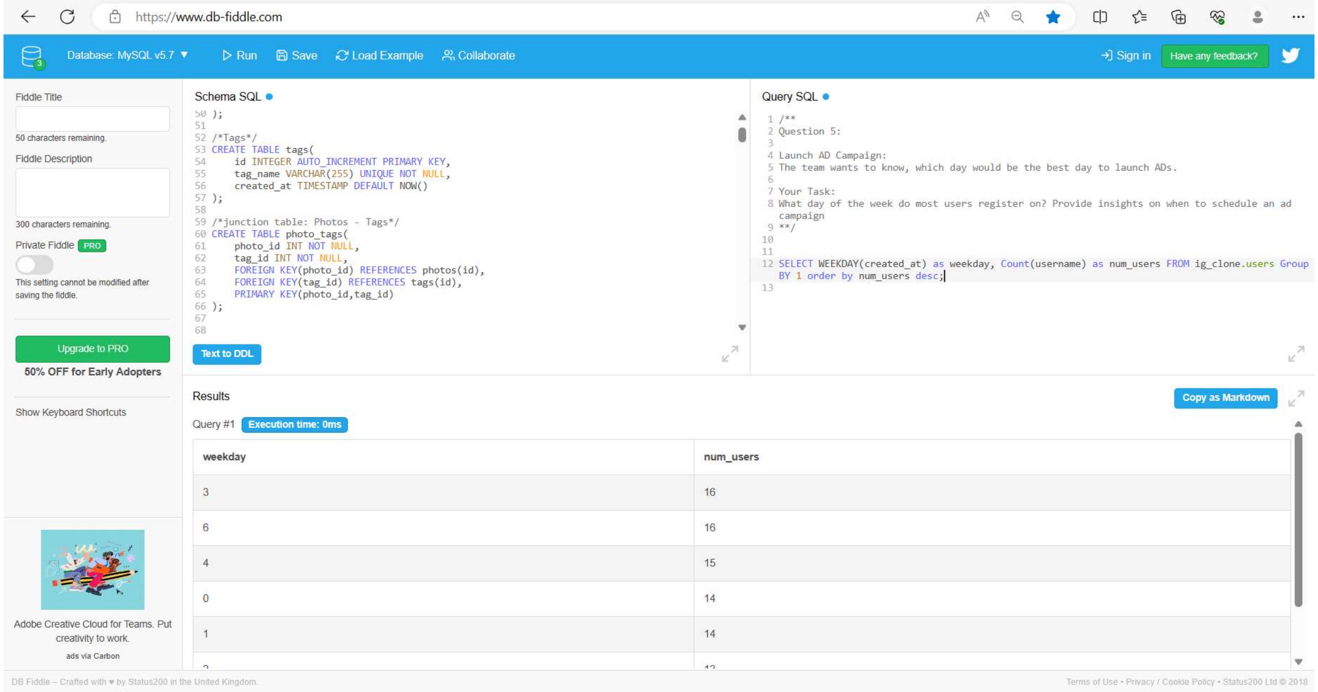
3- Thursday

4- Friday

5- Saturday

6- Sunday

Refer to the image below which shows the query and result found.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Schema SQL

```sql
);

/*Tags*/
CREATE TABLE tags(
    id INTEGER AUTO_INCREMENT PRIMARY KEY,
    tag_name VARCHAR(255) UNIQUE NOT NULL,
    created_at TIMESTAMP DEFAULT NOW()
);

/*junction table: Photos - Tags*/
CREATE TABLE photo_tags(
    photo_id INT NOT NULL,
    tag_id INT NOT NULL,
    FOREIGN KEY(photo_id) REFERENCES photos(id),
    FOREIGN KEY(tag_id) REFERENCES tags(id),
    PRIMARY KEY(photo_id,tag_id)
);


```

Query SQL

```sql
/**
Question 5:

Launch AD Campaign:
The team wants to know, which day would be the best day to launch ADs.

Your Task:
What day of the week do most users register on? Provide insights on when to schedule an ad
campaign
**/


SELECT WEEKDAY(created_at) as weekday, Count(username) as num_users FROM ig_clone.users Group
BY 1 order by num_users desc;

```

Results

Query #1 Execution time: 0ms

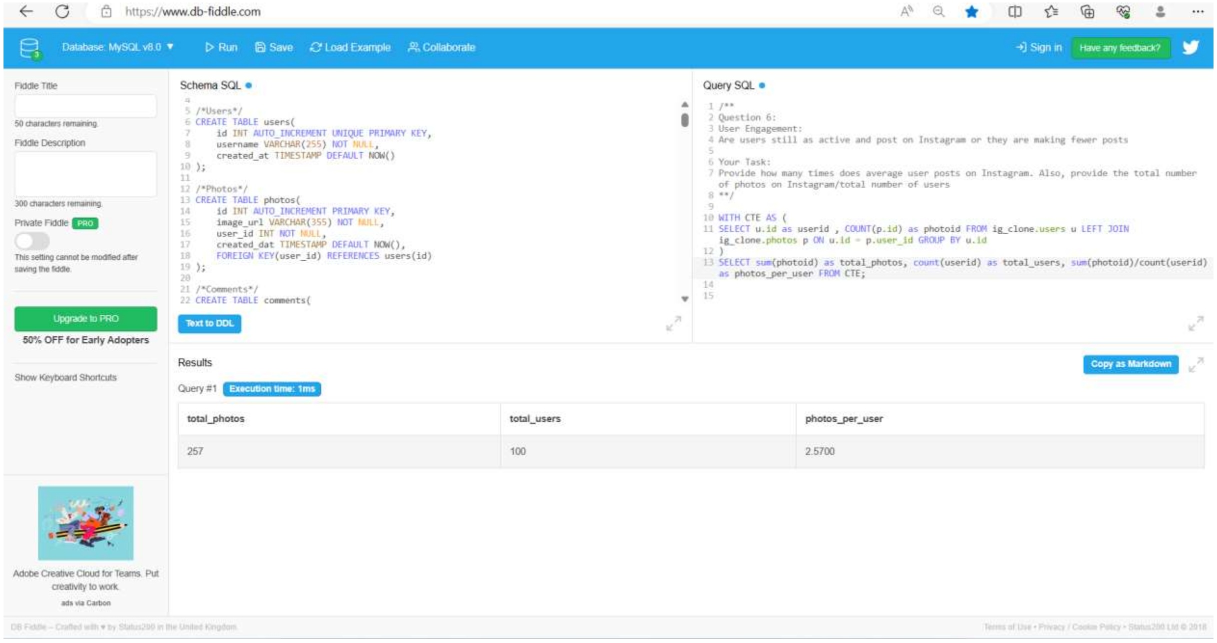
| weekday | num_users |
|---|---|
| 3 | 16 |
| 6 | 16 |
| 4 | 15 |
| 0 | 14 |
| 1 | 14 |
| 2 | 12 |

# Questions by Investor:

The investors want to know if Instagram is performing well and is not becoming redundant like Facebook, they want to assess the app on the grounds of User Engagement and Bots & Fake Accounts, if the platform is crowded with fake and dummy accounts.

**6: User Engagement:** Are users still as active and post on Instagram or they are making fewer posts

Using LEFT JOIN joined two tables and created a temporary table CTE and then found the average user posts on Instagram from CTE. Refer to the image below which shows the query and result found.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Schema SQL

```sql

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CREATE TABLE users(
    id INT AUTO_INCREMENT UNIQUE PRIMARY KEY,
    username VARCHAR(255) NOT NULL,
    created_at TIMESTAMP DEFAULT NOW()
);

/*Photos*/
CREATE TABLE photos(
    id INT AUTO_INCREMENT PRIMARY KEY,
    image_url VARCHAR(355) NOT NULL,
    user_id INT NOT NULL,
    created_dat TIMESTAMP DEFAULT NOW(),
    FOREIGN KEY(user_id) REFERENCES users(id)
);

/*Comments*/
CREATE TABLE comments(
```

Query SQL

```sql
/**
Question 6:
User Engagement:
Are users still as active and post on Instagram or they are making fewer posts

Your Task:
Provide how many times does average user posts on Instagram. Also, provide the total number
of photos on Instagram/total number of users
**/

WITH CTE AS (
SELECT u.id as userid , COUNT(p.id) as photoid FROM ig_clone.users u LEFT JOIN
ig_clone.photos p ON u.id = p.user_id GROUP BY u.id
)
SELECT sum(photoid) as total_photos, count(userid) as total_users, sum(photoid)/count(userid)
as photos_per_user FROM CTE;
```

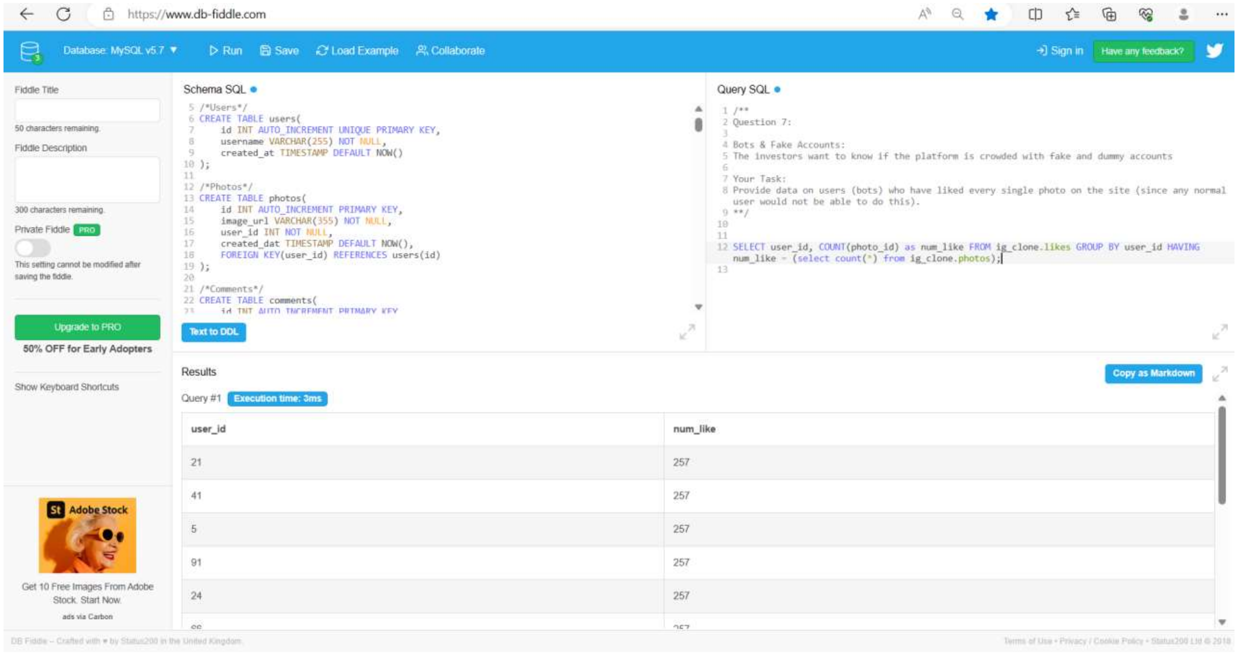
Results

Query #1 Execution time: 1ms

| total_photos | total_users | photos_per_user |
|---|---|---|
| 257 | 100 | 2.5700 |

**7: Bots & Fake Accounts:** The investors want to know if the platform is crowded with fake and dummy accounts

Using COUNT function, GROUP BY and HAVING clause and finally using Sub Query found the users (bots) who have liked every single photo on the site (since any normal user would not be able to do this). Refer to the image below which shows the query and result found.



Schema SQL

```sql
/*Users*/
CREATE TABLE users(
    id INT AUTO_INCREMENT UNIQUE PRIMARY KEY,
    username VARCHAR(255) NOT NULL,
    created_at TIMESTAMP DEFAULT NOW()
);

/*Photos*/
CREATE TABLE photos(
    id INT AUTO_INCREMENT PRIMARY KEY,
    image_url VARCHAR(355) NOT NULL,
    user_id INT NOT NULL,
    created_dat TIMESTAMP DEFAULT NOW(),
    FOREIGN KEY(user_id) REFERENCES users(id)
);

/*Comments*/
CREATE TABLE comments(
    id INT AUTO_INCREMENT PRIMARY KEY
```

Query SQL

```sql
/**
Question 7:

Bots & Fake Accounts:
The investors want to know if the platform is crowded with fake and dummy accounts

Your Task:
Provide data on users (bots) who have liked every single photo on the site (since any normal
user would not be able to do this).
**/


SELECT user_id, COUNT(photo_id) as num_like FROM ig_clone.likes GROUP BY user_id HAVING
num_like = (select count(*) from ig_clone.photos);
```

Results

Query #1 Execution time: 3ms

| user_id | num_like |
|---|---|
| 21 | 257 |
| 41 | 257 |
| 5 | 257 |
| 91 | 257 |
| 24 | 257 |

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**Skills Applied: SQL**

Project by: Suman Saurabh