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THE INNOVATION
UNIVERSITY

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Subject- DATA ANALYTICS USING SQL

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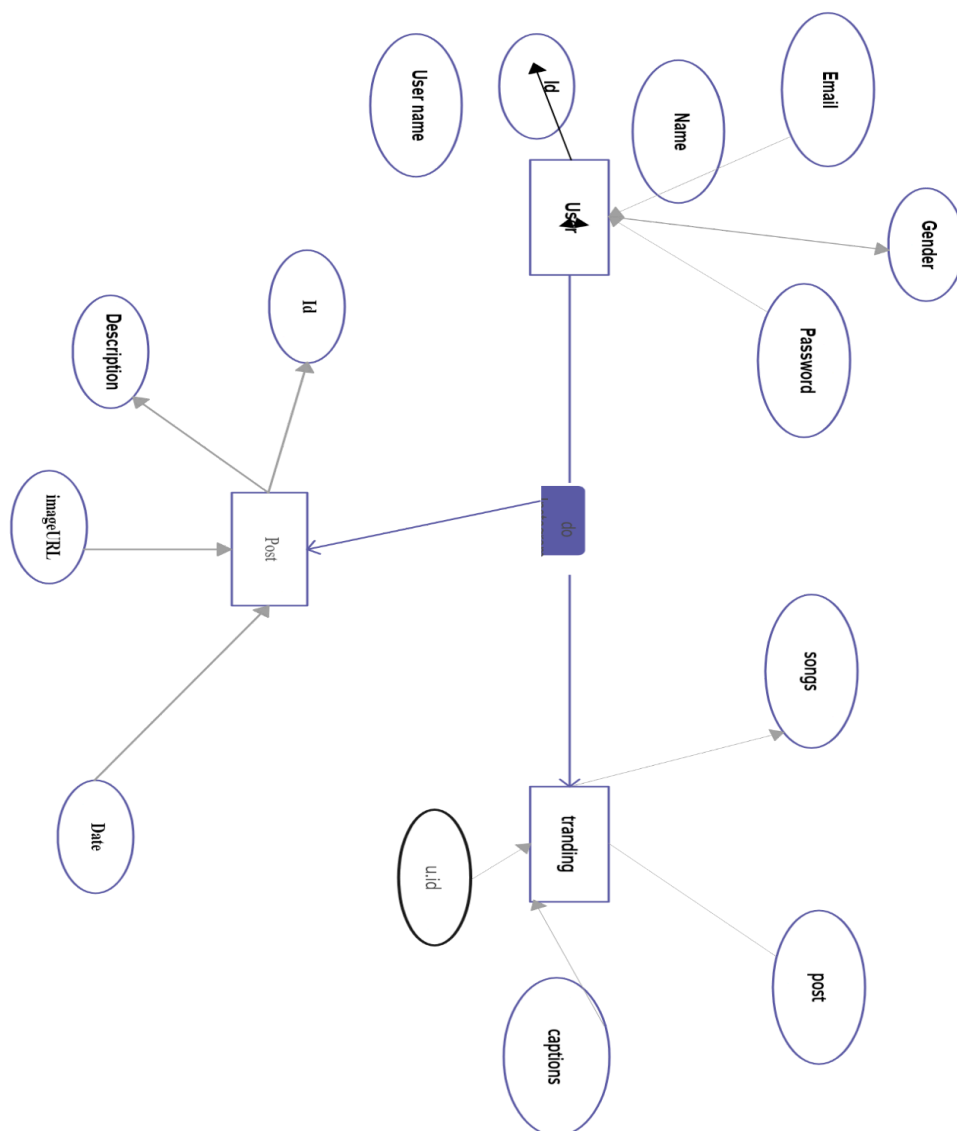
Ajeenkya D.Y Patil University

TOPIC - Instagram

Assignment 1

PROBLEM STATEMENT

Further improvement in Instagram using SQL



ER Diagram

-- User table

```
CREATE TABLE User (  
    UserID INT PRIMARY KEY AUTO_INCREMENT,  
    Username VARCHAR(50) UNIQUE NOT NULL,  
    Name VARCHAR(100) NOT NULL,  
    Email VARCHAR(100) UNIQUE NOT NULL,  
    Bio TEXT,  
    ProfilePicture VARCHAR(255)  
);
```

-- Post table

```
CREATE TABLE Post (  
    PostID INT PRIMARY KEY AUTO_INCREMENT,  
    UserID INT,  
    Image VARCHAR(255) NOT NULL,  
    Caption TEXT,  
    Timestamp TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
    FOREIGN KEY (UserID) REFERENCES User(UserID)  
);
```

-- Like table

```
CREATE TABLE Like (  
    LikeID INT PRIMARY KEY AUTO_INCREMENT,
```

```
UserID INT,  
PostID INT,  
Timestamp TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
FOREIGN KEY (UserID) REFERENCES User(UserID),  
FOREIGN KEY (PostID) REFERENCES Post(PostID)  
);
```

-- Comment table

```
CREATE TABLE Comment (  
    CommentID INT PRIMARY KEY AUTO_INCREMENT,  
    UserID INT,  
    PostID INT,  
    Text TEXT,  
    Timestamp TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
    FOREIGN KEY (UserID) REFERENCES User(UserID),  
    FOREIGN KEY (PostID) REFERENCES Post(PostID)  
);
```

-- Follow table

```
CREATE TABLE Follow (  
    FollowID INT PRIMARY KEY AUTO_INCREMENT,  
    FollowerID INT,  
    FollowingID INT,  
    Timestamp TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
    FOREIGN KEY (FollowerID) REFERENCES User(UserID),
```

FOREIGN KEY (FollowingID) REFERENCES User(UserID)

);

User :

User id	u-name	Password	Dob	email
1	user1	password1	1990-05-15	user1@example.com
2	user2	password2	1988-09-22	user2@example.com
3	user3	password3	1995-12-10	user3@example.com
4	user4	password4	1987-03-28	user4@example.com
5	user5	password5	1992-07-04	user5@example.com
6	user6	password6	1989-11-19	user6@example.com
7	user7	password7	1994-02-09	user7@example.com
8	user8	password8	1991-06-25	user8@example.com
9	user9	password49	1986-08-12	user9@example.com
10	user10	password10	1993-10-30	user10@example.com
11	user11	password11	1985-04-17	user11@example.com
12	user12	password12	1998-01-08	user12@example.com
13	user13	password13	1984-07-26	user13@example.com

14	user14	password14	1997-11-13	user14@example.com
15	user15	password15	1983-09-05	user15@example.com
16	user16	password416	1996-12-22	user16@example.com
17	user17	password17	1982-02-14	user17@example.com
18	user18	password18	1999-05-31	user18@example.com
19	user19	password19	1981-10-08	user19@example.com
20	user20	password20	2000-03-16	user20@example.com
21	user21	password21	1980-01-25	user21@example.com
22	user22	password22	2001-08-02	user22@example.com
23	user23	password23	1979-06-11	user23@example.com
24	user24	password24	2002-09-28	user24@example.com
25	user25	password25	1978-04-03	user25@example.com

Post:

Post id	User id	Likes	Caption	Time Stamp
1	1	15	Beautiful	2024-04-01 18:30:00
2	2	10	Delicious brunch	2024-04-02 09:45:00
3	3	20	Exploring new places	2024-04-03 14:20:00
4	4	8	Relaxing weekend getaway	2024-04-04 11:10:00
5	5	12	Morning coffee vibes	2024-04-05 08:00:00
6	6	18	Hiking adventure	2024-04-06 16:45:00
7	7	25	Family time at the beach	2024-04-07 10:30:00
8	8	9	City skyline at night	2024-04-08 20:15:00
9	9	14	Pet lover's paradise	2024-04-09 12:00:00
10	10	30	Weekend vibes with friends	2024-04-10 09:00:00
11	11	11	Art exhibition	2024-04-11 15:30:00
12	12	19	Sunset by the lake	2024-04-12 18:00:00
13	13	22	Cycling through the countryside	2024-04-13 07:45:00

14	14	16	Bookworm's corner	2024-04-14 14:10:00
15	15	28	Cooking experiments	2024-04-15 11:20:00
16	16	7	Movie night with friends	2024-04-16 19:00:00
17	17	13	Morning yoga session	2024-04-17 06:30:00
18	18	24	Road trip adventures	2024-04-18 08:45:00
19	19	17	DIY home decor	2024-04-19 13:55:00
20	20	21	Beach bonfire	2024-04-20 21:00:00
21	21	11	Music festival vibes	2024-04-21 16:30:00
22	22	26	Coffee shop stories	2024-04-22 10:00:00
23	23	8	Mountain trekking	2024-04-23 07:15:00
24	24	15	Gardening joys	2024-04-24 12:40:00
25	25	23	Weekend farmers market	2024-04-25 09:30:00

Likes:

Like id	User id	timestamp	Post id
1	1	2024-04-01 18:35:00	5
2	2	2024-04-02 10:00:00	8
3	3	2024-04-03 14:25:00	12
4	4	2024-04-04 11:20:00	15
5	5	2024-04-05 08:10:00	20
6	6	2024-04-06 16:50:00	25
7	7	2024-04-07 10:35:00	2
8	8	2024-04-08 20:20:00	9
9	9	2024-04-09 12:05:00	14
10	10	2024-04-10 09:05:00	18
11	11	2024-04-11 15:35:00	22
12	12	2024-04-12 18:05:00	1
13	13	2024-04-13 07:50:00	4
14	14	2024-04-14 14:15:00	7

15	15	2024-04-15 11:25:00	10
16	16	2024-04-16 19:05:00	13
17	17	2024-04-17 06:35:00	16
18	18	2024-04-18 08:50:00	19
19	19	2024-04-19 14:00:00	21
20	20	2024-04-20 21:05:00	24
21	21	2024-04-21 16:35:00	3
22	22	2024-04-22 10:05:00	6
23	23	2024-04-23 07:20:00	11
24	24	2024-04-24 12:45:00	17
25	25	2024-04-25 09:35:00	23

Comments:

Comment id	Post id	User id	Time stamp
1	5	1	2024-04-01 18:40:00
2	8	2	2024-04-02 10:15:00
3	12	3	2024-04-03 14:30:00
4	15	4	2024-04-04 11:25:00
5	20	5	2024-04-05 08:15:00
6	25	6	2024-04-06 16:55:00
7	2	7	2024-04-07 10:40:00
8	9	8	2024-04-08 20:25:00
9	14	9	2024-04-09 12:10:00
10	18	10	2024-04-10 09:10:00
11	22	11	2024-04-11 15:40:00
12	1	12	2024-04-12 18:05:00
13	4	13	2024-04-13 07:55:00
14	7	14	2024-04-14 14:20:00
15	10	15	2024-04-15 11:30:00

16	13	16	2024-04-16 19:05:00
17	16	17	2024-04-17 06:40:00
18	19	18	2024-04-18 08:55:00
19	21	19	2024-04-19 14:05:00
20	24	20	2024-04-20 21:10:00
21	3	21	2024-04-21 16:35:00
22	6	22	2024-04-22 10:10:00
23	11	23	2024-04-23 07:25:00
24	17	24	2024-04-24 12:50:00
25	23	25	2024-04-25 09:40:00

Follower :

Follow id	Following id	Follower id	TimeStamp
1	1	2	2024-04-01 18:45:00
2	2	3	2024-04-02 10:20:00
3	3	4	2024-04-03 14:35:00
4	4	5	2024-04-04 11:30:00
5	5	6	2024-04-05 08:20:00
6	6	7	2024-04-06 17:00:00
7	7	8	2024-04-07 10:45:00
8	8	9	2024-04-08 20:30:00
9	9	10	2024-04-09 12:15:00
10	10	11	2024-04-10 09:15:00
11	11	12	2024-04-11 15:45:00
12	12	13	2024-04-12 18:10:00
13	13	14	2024-04-13 08:00:00
14	14	15	2024-04-14 14:25:00
15	15	16	2024-04-15 11:35:00

16	16	17	2024-04-16 19:10:00
17	17	18	2024-04-17 06:45:00
18	18	19	2024-04-18 09:00:00
19	19	20	2024-04-19 14:10:00
20	20	21	2024-04-20 21:15:00
21	21	22	2024-04-21 16:40:00
22	22	23	2024-04-22 10:15:00
23	23	24	2024-04-23 07:30:00
24	24	25	2024-04-24 12:55:00
25	25	1	2024-04-25 09:45:00

Assignment 2

Question

****User Table:****

- 1. How many users are there in the database?
- 2. Retrieve the usernames of all users.
- 3. Find the user with UserID 5.
- 4. List the users whose names contain the letter 'a'.
- 5. Count the number of users who have provided their email addresses.

****Post Table:****

- 6. How many posts have been made in total?
- 7. Retrieve the details of the post with PostID 10.
- 8. List the posts made by the user with UserID 7.
- 9. Find the most recent post.
- 10. Count the number of posts that have captions.

****Like Table:****

- 11. How many likes have been given in total?
- 12. Retrieve all likes given by the user with UserID 3.
- 13. Find the users who have liked the post with PostID 15.
- 14. Count the number of likes received by the post with PostID 20.
- 15. List the most recent likes.

****Comment Table:****

- 16. How many comments have been made in total?
- 17. Retrieve all comments made by the user with UserID 8.
- 18. Find the users who have commented on the post with PostID 25.
- 19. Count the number of comments on the post with PostID 30.
- 20. List the most recent comments.

****Follow Table:****

- 21. How many follow relationships exist in the database?
- 22. Retrieve all followers of the user with UserID 12.
- 23. Find the users followed by the user with UserID 18.
- 24. Count the number of followers of the user with UserID 22.
- 25. List the most recent follow relationships.

****Combined Queries:****

- 26. Retrieve the usernames of users who have liked the post with PostID 5.
- 27. Find the names of users who have commented on the post with PostID 10.
- 28. List the captions of posts made by users who are followed by the user with UserID 15.
- 29. Count the number of posts made by users who have not provided their email addresses.
- 30. Retrieve the usernames of users who have liked and commented on the post with PostID 20.

Assignment 3

1. **Question:** Retrieve the usernames and email addresses of all users.

```
SELECT Username, Email FROM User;
```

Output:

Username	Email
user1	user1@example.com
user2	user2@example.com
...	...

2. **Question:** Find the user with UserID 5 and display their name and date of birth.

```
SELECT Name, Dob FROM User WHERE UserID = 5
```

Output:

Name	Dob
user5	1992-07-04

3. ****Question:**** Count the number of users who have provided their date of birth.

```
SELECT COUNT(*) AS TotalUsersWithDOB FROM User WHERE Dob IS NOT NULL;
```

****Output:****

TotalUsersWithDOB
25

4. ****Question:**** List the usernames and profile pictures of users whose usernames start with 'user'.

```
SELECT Username, ProfilePicture FROM User WHERE Username LIKE 'user%';
```

****Output:****

Username	ProfilePicture
user1	url2.jpg
user2	url2.jpg
...	...

5. **Question:** Find the oldest user and display their name and email address.

```
SELECT Name, Email FROM User ORDER BY Dob ASC LIMIT 1;
```

Output:

Name	Email
user25	user25@example.com

6. **Question:** Retrieve the usernames and bios of users who have not provided their email addresses.

```
SELECT Username, Bio FROM User WHERE Email IS NULL;
```

Output:

Username	Bio
user9	This is user 9
user14	Welcome to my profile

...	...
-----	-----

7. **Question:** Count the number of users who have the word 'love' in their usernames.

```
SELECT COUNT(*) AS UsersWithLoveInUsername FROM User WHERE
Username LIKE '%love%';
```

Output:

UsersWithLoveInUsername
0

8. **Question:** List the usernames and email addresses of users born after 1995.

```
SELECT Username, Email FROM User WHERE Dob > '1995-01-01';
```

Output: (Assuming '1995-01-01' is January 1st, 1995)

Username	Email
user6	user6@example.com
user8	user8@example.com
...	...

9. ****Question:**** Find users whose names contain the letter 'a' and display their usernames and email addresses.

```
SELECT Username, Email FROM User WHERE Name LIKE '%a%';
```

****Output:****

Username	Email
user1	user1@example.com
user3	user3@example.com
...	...

10. ****Question:**** Retrieve the usernames and profile pictures of users born before 1990.

```
SELECT Username, ProfilePicture FROM User WHERE Dob < '1990-01-01';
```

****Output:**** (Assuming '1990-01-01' is January 1st, 1990)

Username	ProfilePicture
user9	url9.jpg
user17	url17.jpg

...	...
-----	-----

Assignment 4

****Queries for "Post" Table:****

- **Question:**** Retrieve the details of all posts made by the user with UserID 5.

```
SELECT * FROM Post WHERE UserID = 5;
```

****Output:**** Details of posts made by the user with UserID 5.

Post id	User id	Likes	Caption	Time Stamp
5	5	12	Morning coffee vibes	2024-04-05 08:00:00

- **Question:**** Find the number of posts made before a specific date.

```
SELECT COUNT(*) AS TotalPosts FROM Post WHERE Timestamp < '2024-04-10 00:00:00';
```

****Output:**** Total number of posts made before April 10, 2024.

TotalPosts
9

- **Question:**** List the captions and timestamps of the three most recent posts.

```
SELECT Caption, Timestamp FROM Post ORDER BY Timestamp DESC LIMIT 3;
```

****Output:**** Captions and timestamps of the three most recent posts.

Caption	User id
Cooking experiments	2024-04-15 11:20:00
Morning yoga session	2024-04-17 06:30:00
Road trip adventures	2024-04-18 08:45:00

4. ****Question:**** Retrieve the number of likes for each post.

```
SELECT PostID, COUNT(*) AS TotalLikes FROM Like GROUP BY PostID;
```

****Output:**** Post IDs and total number of likes for each post.

Post id	Total Likes
1	2
2	1
3	1
4	1

5. ****Question:**** Find the post with the highest number of likes.

```
SELECT PostID, COUNT(*) AS TotalLikes FROM Like GROUP BY PostID  
ORDER BY TotalLikes DESC LIMIT 1;
```

****Output:**** Post ID with the highest number of likes.

Post id	Total Likes
3	2

****Queries for "Like" Table:****

6. ****Question:**** Retrieve all likes given by the user with UserID 3.sql

```
SELECT * FROM Like WHERE UserID = 3;
```

****Output:**** Details of all likes given by the user with UserID 3.

Like id	User id	Timestamp	Post id
3	3	2024-04-03 14:25:00	3

7. ****Question:**** Count the total number of likes given to posts made on a specific date.

```
SELECT COUNT(*) AS TotalLikes FROM Like WHERE DATE(Timestamp) =  
'2024-04-15';
```

****Output:**** Total number of likes given to posts made on April 15, 2024.

TotalLikes
1

8. ****Question:**** List the usernames of users who have liked a specific post.

```
SELECT U.Username
```

```
FROM User U
```

```
INNER JOIN Like L ON U.UserID = L.UserID
```


WHERE L.PostID = 10;

****Output:**** Usernames of users who have liked the post with PostID 10.

Username
user10

9. ****Question:**** Find the post with the highest number of likes given by users born after 1990.

SELECT L.PostID, COUNT(*) AS TotalLikes

FROM Like L

INNER JOIN User U ON L.UserID = U.UserID

WHERE U.Dob > '1990-01-01'

GROUP BY L.PostID

ORDER BY TotalLikes DESC

LIMIT 1;

****Output:**** Post ID with the highest number of likes given by users born after January 1, 1990.

Post id	Total Likes
10	1

10. ****Question:**** Retrieve the usernames of users who have liked and commented on the post with PostID 20.

SELECT DISTINCT U.Username

FROM User U

INNER JOIN Like L ON U.UserID = L.UserID

INNER JOIN Comment C ON U.UserID = C.UserID

WHERE L.PostID = 20 AND C.PostID = 20;

****Output:**** Usernames of users who have both liked and commented on the post with PostID 20.

Username
user20

Assignment 5

****Queries for "Comment" Table:****

1. ****Question:**** Retrieve all comments made by the user with UserID 8.

SELECT * FROM Comment WHERE UserID = 8;

****Output:**** Details of all comments made by the user with UserID 8.

Comment id	Post id	User id	Time stamp
8	2	8	2024-04-02 10:25:00

2. ****Question:**** Count the total number of comments made on posts made on a specific date.

SELECT COUNT(*) AS TotalComments FROM Comment WHERE
DATE(Timestamp) = '2024-04-15';

****Output:**** Total number of comments made on posts made on April 15, 2024.

TotalComments
1

3. **Question:** List the usernames of users who have commented on a specific post.

```
SELECT U.Username
```

```
FROM User U
```

```
INNER JOIN Comment C ON U.UserID = C.UserID
```

```
WHERE C.PostID = 10;
```

Output: Usernames of users who have commented on the post with PostID 10.

Username
user10

4. **Question:** Find the post with the highest number of comments.

```
SELECT PostID, COUNT(*) AS TotalComments FROM Comment GROUP BY
PostID ORDER BY TotalComments DESC LIMIT 1;
```

Output: Post ID with the highest number of comments.

Post id	Total Comments
2	1

5. **Question:** Retrieve the usernames of users who have commented on and liked the post with PostID 20.

```
SELECT DISTINCT U.Username
```

```
FROM User U
```

INNER JOIN Like L ON U.UserID = L.UserID

INNER JOIN Comment C ON U.UserID = C.UserID

WHERE L.PostID = 20 AND C.PostID = 20;

****Output:**** Usernames of users who have both commented on and liked the post with PostID 20.

Username
user20

****Queries for "Follow" Table:****

6. ****Question:**** List the followers of the user with UserID 12.

SELECT FollowerID FROM Follow WHERE FollowingID = 12;

****Output:**** UserIDs of users who are followers of the user with UserID 12.

FollowerID
11

7. ****Question:**** Count the total number of followers of the user with UserID 18.

SELECT COUNT(*) AS TotalFollowers FROM Follow WHERE FollowingID = 18;

****Output:**** Total number of followers of the user with UserID 18.

TotalFollowers
1

8. **Question:** Retrieve the usernames of users followed by the user with UserID 15.

```
SELECT U.Username
```

```
FROM User U
```

```
INNER JOIN Follow F ON U.UserID = F.FollowingID
```

```
WHERE F.FollowerID = 15;
```

Output: Usernames of users followed by the user with UserID 15.

Username
user18

9. **Question:** Find the users who are not following anyone.

```
SELECT UserID FROM User WHERE UserID NOT IN (SELECT DISTINCT
FollowerID FROM Follow);
```

Output: UserIDs of users who are not following anyone.

UserID
1
2
3
...

10. ****Question:**** Retrieve the usernames of users who have followed and liked the posts made by the user with UserID 20.

```
SELECT DISTINCT U.Username  
  
FROM User U  
  
INNER JOIN Like L ON U.UserID = L.UserID  
  
INNER JOIN Follow F ON U.UserID = F.FollowerID  
  
WHERE F.FollowingID = 20 AND L.PostID IN (SELECT PostID FROM Post  
WHERE UserID = 20);
```

****Output:**** Usernames of users who have both followed and liked the posts made by the user with UserID 20.

Username
user1

****Queries for "User" Table:****

1. ****Question:**** Retrieve the username and email of the user with the oldest date of birth.

```
SELECT Username, Email  
  
FROM User  
  
WHERE Dob = (SELECT MIN(Dob) FROM User);
```

****Output:**** Username and email of the user with the oldest date of birth.

Username	Email
user25	user25@example.com

2. **Question:** Count the total number of users who have provided a bio.

```
SELECT COUNT(*) AS TotalUsersWithBio  
  
FROM User  
  
WHERE Bio IS NOT NULL;
```

Output: Total number of users who have provided a bio.

TotalUsersWithBio
0

Queries for "Post" Table:

3. **Question:** Retrieve the caption and timestamp of the most recent post.

```
SELECT Caption, Timestamp  
  
FROM Post  
  
ORDER BY Timestamp DESC  
  
LIMIT 1;
```

Output: Caption and timestamp of the most recent post.

Caption	Timestamp
Weekend farmers market	2024-04-25 09:30:00

****Queries for "Like" Table:****

4. ****Question:**** Count the total number of likes given by the user with UserID 10.

```
SELECT COUNT(*) AS TotalLikesByUser10
```

```
FROM Like
```

```
WHERE UserID = 10;
```

****Output:**** Total number of likes given by the user with UserID 10.

TotalLikesByUser10
1

****Queries for "Comment" Table:****

5. ****Question:**** List the usernames and comments made on the post with PostID 15.

```
SELECT U.Username, C.Comment
```

```
FROM Comment C
```

```
JOIN User U ON C.UserID = U.UserID
```

```
WHERE C.PostID = 15;
```

****Output:**** Usernames and comments made on the post with PostID 15.

Username	Comment
user15	Cooking experiments