SQL Queries and Relational Algebra answering physical model

1. What user posted this tweet?

   Query1:

   Select tweets.twitter_handle, user.user_name, tweets.tweet_description
   from tweets inner join user on tweets.twitter_handle=user.twitter_handle
   where tweet_id = 1596997211048808448;

   Relational Notation: $\Pi_{\text{twitter\_handle, tweet\_text}}(\sigma_{\text{tweet\_id}} = \text{'1596997211048808448'} \text{(tweets)})$

2. When did the user post this tweet?

   Query2:

   Select tweets.twitter_handle, user.user_name, tweets.tweet_description,
   tweets.created_at from tweets inner join user on
   tweets.twitter_handle = user.twitter_handle
   where tweet_id = 1596997211048808448;

   Relational Notation: $\Pi_{\text{twitter\_handle, tweet\_text, created\_at}}(\sigma_{\text{tweet\_id}} = \text{'1596997211048808448'}$
   (tweets))

3. What tweets have this user posted in the past 24 hours?

   Query3:

   Select tweets.twitter_handle, tweets.tweet_id, tweets.created_at,
   tweets.tweet_description from tweets

where tweets.twitter_handle='Patricia' and created_at between '2022-11-11' and '2022-11-12';

Relational Notation: $\Pi_{twitter\_id,\ tweet\_text}(\sigma_{twitter\_handle\ =\ \text{‘@smith’}} \cap$ created_at

between (‘2022-11-11) and (‘2022-11-12)) (Tweets)

4. How many tweets have this user posted in the past 24 hours?

   Query4:

   Select count(tweet_id) as NoOfTweets from tweets where

   twitter_handle= 'Patricia' and created_at between '2022-11-11' and '2022-11-12';

   Relational Notation: ρ NoOfTweets ($\prod$ count(tweet_id) (σ

   twitter_handle=’Patricia’ $\cap$ created_at between (SYSDATE-1) and

   SYSDATE ()) (Tweets))

5. When did this user join twitter?
   Query5:

   Select u.twitter_handle, u.user_name, u.join_date from tweets t, user u
   where u.twitter_handle=t.twitter_handle and u.twitter_handle= 'Patricia';

   Relational Notation: $\prod$ (u.twitter_handle, u.join_date)σ (u.twitter_handle =

   "$_{smith}$")(User$\bowtie$Tweets$_{u.twitter\_handle=t.twitter\_handle}$)

6. What keywords/hashtags are popular?

Query6:

Select hashtags from tweets group by hashtags having count(tweet_id)>2;

Relational Notation: Not possible as Group By function does not exist in relational algebra.

7. What tweets are popular?

Query7:

Select tweet_id from tweets where retweet_count>1;

Relational Notation: $\prod (tweet\_id)(\sigma\ retweet > 60)\ (tweets)$

8. What is the followers and following count for this user?

Query8:

Select follower_count, following_count from user where user_name='Patricia';

Relational Notation: $\prod (tweet\_id)(\sigma\ retweet > 60)\ (tweets)$

9. Who are the influential users and what are the tweets posted by them?

Query9:

Select distinct t.twitter_handle, t.tweet_description from user u, tweets t where user_type = 'True';

10. List the top 5 locations based on the tweets posted ?

Query10:

Select count(t.tweet_id) as total_tweets , u.location from user u, tweets t
where u.twitter_handle=t.twitter_handle and u.location != "
group by location
order by count(t.tweet_id) desc
limit 5;

Relational Notation: Not possible as Group By function does not exist in relational algebra.

11. List the locations with number of crime incidents reported?

Query11:

Select count(u.location) as total_crime, u.location from user u, tweets t
where u.twitter_handle=t.twitter_handle and t.tweet_description like
'%crime%' and u.location != "
group by location
order by count(u.location) desc;

Relational Notation: Not possible as Group By function does not exist in relational algebra.