IM Assignment 3 - Graph Databases
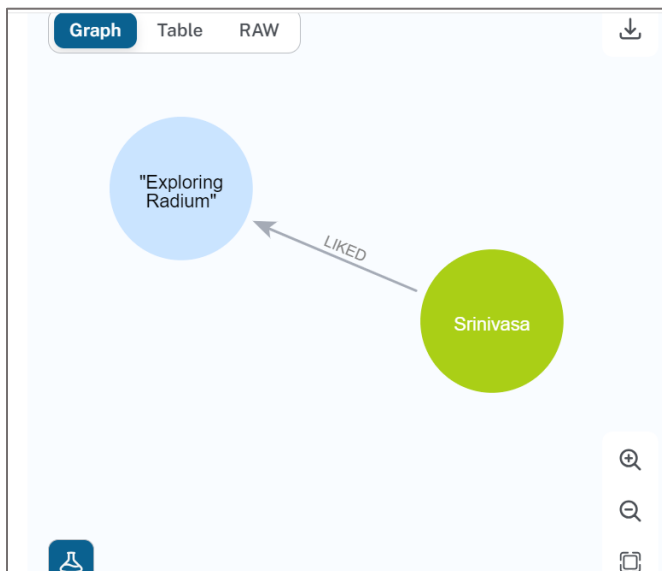
- **SANYAM JAIN (sj33448)**

1. **Find all posts created by Isaac and list the users who liked those posts.**

Query:

MATCH (u: Users {Name: 'Isaac'})-[:CREATED]->(p:Posts)<-[:LIKED]-(l:Users)

RETURN p,l,u;

Answer:

Post is "Exploring Radium", liked only by Srinivasa

2. **Write a query to identify posts that received more than two comments and display the number of comments for each of these posts.**

Query:
```
MATCH (p:Posts)<-[:COMMENTED_ON]-(c:Comments)
WITH p, count(c) as c_cnt
WHERE c_cnt > 2
RETURN p.PostID as Posts, c_cnt
ORDER BY c_cnt DESC
```

Answer :
Query did not return anything.

3. **Calculate the user engagement score for each user, where the score is the sum of the likes received on their posts and comments. List users ranked by their engagement score.**

Query:
MATCH (u:Users)
OPTIONAL MATCH (u)-[:CREATED]->(p:Posts)<-[:LIKED]-(liker:Users)
WITH u, count(DISTINCT liker) as p_likes
OPTIONAL MATCH (u)-[:COMMENTED_ON]->(c:Comments)<-[:LIKED]-(comm_liker:Users)
WITH u, p_likes, count(DISTINCT comm_liker) as c_likes
SET u.engagementScore = p_likes + c_likes
RETURN u.Name as Name, u.engagementScore as EngagementScore
ORDER BY EngagementScore DESC

Answer :
User engagement score is 0 for everyone except Isaac who has score of 1.

Name	EngagementScore
Table RAW	
"Isaac"	1
"Richard"	0
"Chandrasekhara	0
"Srinivasa"	0
"Galileo"	0
"Marie"	0
"Albert"	0
"Oviyasri"	0
"Rabindranath"	0

✓ Set 10 properties

4. Calculate the average number of comments on posts created by each user. List users with their average comment counts.

Query:
MATCH (u:Users)
OPTIONAL MATCH (u)-[:CREATED]->(p:Posts)
WITH u, COLLECT(p) AS p_created
OPTIONAL MATCH (p:Posts)<-[:COMMENTED_ON]-() WHERE p IN p_created
WITH u, SIZE(p_created) AS tot_post, COUNT(p) AS post_comm
RETURN u.Name AS Name, CASE WHEN post_comm = 0 THEN 0 ELSE post_comm/toFloat(tot_post) END AS avg_commm

Answer:

Name	avg_commm
"Isaac"	2.0
"Richard"	1.0
"Chandrasekhara	0
"Srinivasa"	0
"Galileo"	0
"Marie"	0
"Albert"	0
"Oviyasri"	0
"Rabindranath"	0
"Paul"	0

5. Propose a real-world use case where this social network graph database could be applied effectively, considering user engagement, content creation, and interactions. Describe the scenario and how the database would be used.

Answer:

A social network graph database powers a professional networking and talent-matching platform in this scenario, improving user engagement, content development, and interactions among professionals.

A recommendation system evaluates individuals' professional backgrounds, talents, and career goals in order to provide personalized connections, job opportunities, and educational materials. Endorsements and recommendations for skills improve users' professional position and interaction.

Users create detailed professional profiles highlighting their work history, talents, and achievements. They provide industry-specific content, while businesses and users submit job opportunities and talent needs. The database categorizes and recommends items based on the interests of the users. Discussions and content exchange are encouraged by professional groups and communities. Interactions are made easier with private chat and job application capabilities.

The database facilitates efficient connections by easing job applications, recruitment, and professional networking. Using graph data modeling, this platform connects professionals, refines job matching, and accelerates career progression. Users form networks, discover possibilities, and share industry knowledge, making it a great resource for professional development.