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DBMS TASK - 9 REPORT

Title: CRUD operations in Graph databases

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TASK 9

CRUD operations in Graph databases

AIM:

To perform CRUD operations like creating, inserting, querying, finding, deleting operations on graph spaces.

The steps to get started with Neo4j's Aura Graph Database:

Step1: Copy and paste the following link into your web browser:

<https://neo4j.com/cloud/platform/aura-graph-database/?ref=docs-get-started-dropdown>

Step2: Click on "Start Free."

Step3: Choose the option to "Continue with Google."

Step4: Click the "Open" button.

Step5: After clicking "Open," a text file will be automatically downloaded. This file contains your user ID and password details.

Step6: Copy the password from the downloaded text file and paste it where required.

Step7: Close the "Get started with Neo4j with beginner guides" if it's open.

Step8: You're now ready to begin practicing with the Graph Database.

Create Node with Properties

Properties are the key-value pairs using which a node stores data. Create a node with properties using the CREATE clause and need to specify these properties separated by commas within the flower braces “{ }”.

Syntax

```
CREATE (node:label{ key1: value, key2: value, ..... }) return node
```

To verify the creation of the node, type and execute the following query in the dollar prompt.

Syntax:

```
MATCH (n) RETURN n
```

Creating Relationships

To create a relationship using the CREATE clause and specify relationship within the square braces “[]” depending on the direction of the relationship it is placed between hyphen “ - ” and arrow “ → ” as shown in the following syntax.

Syntax:

```
CREATE (node1)-[:RelationshipType]->(node2)
```

Syntax:

```
MATCH (a:LabeofNode1), (b:LabeofNode2)  
WHERE a.name = "nameofnode1" AND b.name = " nameofnode2"  
CREATE (a)-[: Relation]->(b) RETURN a,b
```

Deleting a Particular Node

To delete a particular node and need to specify the details of the node in the place of “n” in the above query.

Syntax:

```
MATCH (node:label {properties . . . . . }) DELETE node
```

Create a graph database for student course registration, create student and dept node and insert values of properties.

Create a CricketBoard Node:

```
create(cb:CricketBoard{BoardID:'BID01',Name:'Chennai Cricket Board', Address:'Chennai',  
Phone:9988776699}) return cb
```

Create Team Nodes:

```
create(t1:Team{teamID:'CCB01',BoardID:'BID01',name:'ABS EXPRESS',  
Coach:'G.D.RAMESH', Captain:'SAMPATH KUMAR'}) return t1
```

```
create(t2:Team{teamID:'CCB02',BoardID:'BID01',name:'AVG EXPRESS',Coach:  
'T.KARTHIKH', Captain:'Y.JOHN'}) return t2
```

Create Player Nodes:

```
create(p1:Player{PlayerID:'1',TeamID:'CCB01',Name:'Raj',Age:23,DateofBirth:'29-JUN-1996',  
PlayingRole:'Bowler',email:'rajn@gmail.com'}) return p1
```

```
create(p2:Player{PlayerID:'33',TeamID:'CCB01',Name:'Anand',Age:23,DateofBirth:'02-JAN-  
1999', PlayingRole:'Batsman',email:'balajid@gmail.comm'}) return p2
```

```
create(p3:Player{PlayerID:'65',TeamID:'CCB02',Name:'Suresh',Age:27,DateofBirth:'02-JUN-1996', PlayingRole:'Batsman',email:'sureshd@gmail.comm'}) return p3
```

```
create(p4:Player{PlayerID:'75',TeamID:'CCB02',Name:'Rohit',Age:33,DateofBirth:'02-JUN-1991', PlayingRole:'Batsman',email:'srohit@gmail.comm'}) return p4
```

Creating Relationship among CricketBoard and Teams:

```
match(cb:CricketBoard{BoardID:'BID01'}),(t1:Team{teamID:'CCB01'}) create(cb)-[r:has]->(t1)  
return cb,r,t1
```

```
match(cb:CricketBoard{BoardID:'BID01'}),(t2:Team{teamID:'CCB02'}) create(cb)-[r:has]->(t2)  
return cb,r,t2
```

Creating Relationship among Players and Teams:

```
match(p1:Player{PlayerID:'1'}),(t1:Team{teamID:'CCB01'}) create(p1)-[r1:playfor]->(t1)  
return p1,r1,t1
```

```
match(p2:Player{PlayerID:'33'}),(t1:Team{teamID:'CCB01'}) create(p2)-[r2:playfor]->(t1)  
return p2,r2,t1
```

```
match(p3:Player{PlayerID:'65'}),(t2:Team{teamID:'CCB02'}) create(p3)-[r3:playfor]->(t2)  
return p3,r3,t2
```

```
match(p4:Player{PlayerID:'75'}),(t2:Team{teamID:'CCB02'}) create(p4)-[r4:playfor]->(t2)  
return p4,r4,t2
```

Display All nodes: match(n) return n

Output:

The screenshot shows the Neo4j Browser interface with the following details:

- Database Information:** Shows 8 nodes and 7 relationships. Nodes include CricketBoard, Player, Team, Rohit, Suresh, and others. Relationships include has and playfor.
- Query Bar:** The query entered is `match(n) return n`.
- Graph View:** A visualization of the graph structure with nodes represented by colored circles (yellow, pink, blue) and relationships as lines connecting them.
- Results Overview:** Summary of the query results: 8 nodes (1 CricketBoard, 4 Players, 2 Teams).
- System Status:** Last update at 9:31:11 pm. A message to "Activate Windows" is displayed.

OUTPUT:

The screenshot shows the Neo4j Aura workspace interface. On the left, there's a sidebar with 'Database Information' sections for Nodes (8), Relationships (7), and Property keys. The main area displays a query result: `neo4j $ match(n) return n`. The results are shown in a Graph view, where nodes are represented by colored circles (red, yellow, blue) and relationships by lines. A specific node, 'Team', is highlighted in yellow. To the right of the graph, the 'Node Details' pane shows the properties for the selected 'Team' node, including `<id>`, `BoardID`, `teamID`, `name`, `Captain`, and `Coach`. The Captain is listed as 'SAMPATH KUMAR' and the Coach as 'G.D.RAMESH'. The bottom status bar indicates the last update was at 9:31:11 pm.

Retrieve particular player details:

```
match(p:Player{PlayerID:'33'}) return p
```

This screenshot shows the same Neo4j workspace after running the query `match(p:Player{PlayerID:'33'}) return p`. The results are displayed in the Graph view, where a single node, 'Anand', is highlighted in pink. The 'Node Details' pane to the right shows the properties for this node, including `<id>`, `PlayerID`, `PlayingRole`, `DateOfBirth`, `TeamID`, `email`, `Age`, and `Name`. The player's name is listed as 'Anand'. The bottom status bar indicates the query started streaming 1 record after 44ms and completed after 46ms.

Update particular player details:

```
match(p:Player{PlayerID:'1'}) set p.age=27 return p
```

Output:

The screenshot shows the Neo4j Browser interface. On the left, the 'Database Information' sidebar lists nodes (8), relationships (7), and property keys. Nodes include CricketBoard, Player, and Team. Relationships include has and playfor. Property keys listed are Address, Age, age, BoardID, Captain, Coach, data, DateofBirth, did, dname, eid, email, ename, id, name, Name, nodes, Phone, PlayerID, PlayingRole. A central query window shows the command: `neo4j$ match(p:Player{PlayerID:'1'}) set p.age=27 return p`. To the right, a node detail view for a 'Player' node named 'Raj' is displayed, showing properties like id, PlayerID, PlayingRole, DateofBirth, TeamID, age, email, Age, and Name. The node has a pink circular background.

Delete particular player from the team:

```
match(p:Player{PlayerID:'33'}) delete p
```

The screenshot shows the Neo4j Browser interface. The database information sidebar remains the same. The central query window shows the command: `neo4j$ match(p:Player{PlayerID:'33'}) delete p`. Below the query, an error message is displayed: **Neo.ClientError.Schema.ConstraintValidationFailed**. The message states: `Cannot delete node<1>, because it still has relationships. To delete this node, you must first delete its relationships.`.

Result:

Thus the CRUD operations like creating, inserting, querying, finding, deleting operations on graph spaces were executed successfully.