Rehmah Ahmed Batki
MSC DSAI L010

Practical 8

18-3-25

Neo4j

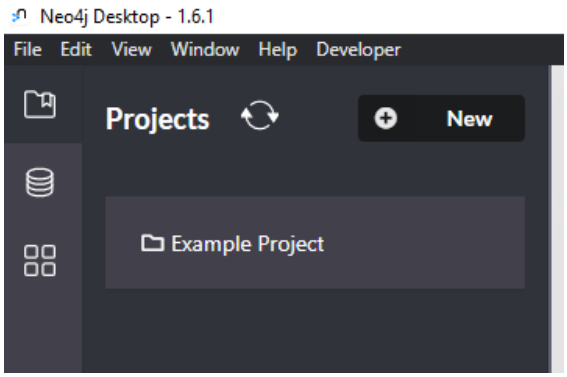
Write-up: -

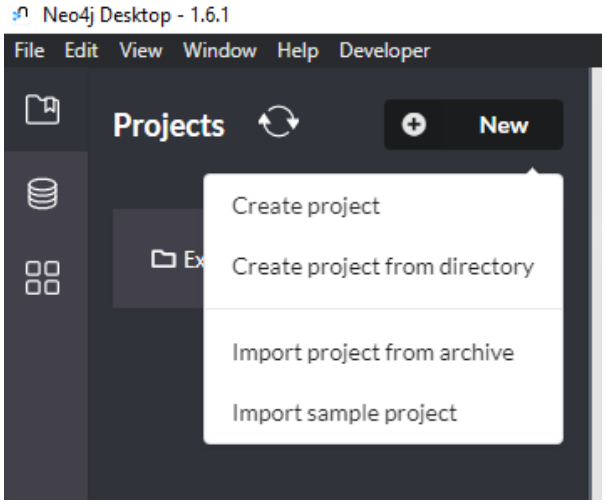
- Graph databases
- Graph databases vs Relational DBMS
- Neo4j
- Cypher query language
- Any 5 CQL constructs

Basic Commands (Tutorials Point)

Starting Server

Create new project





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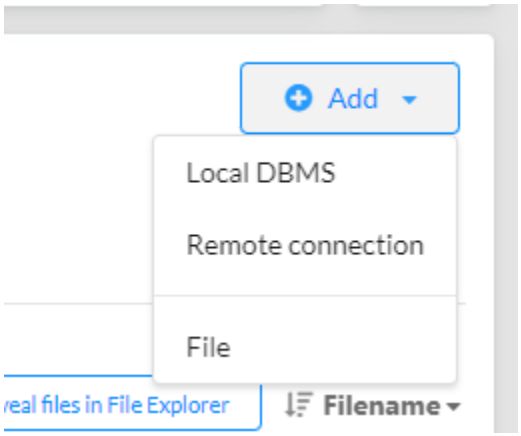
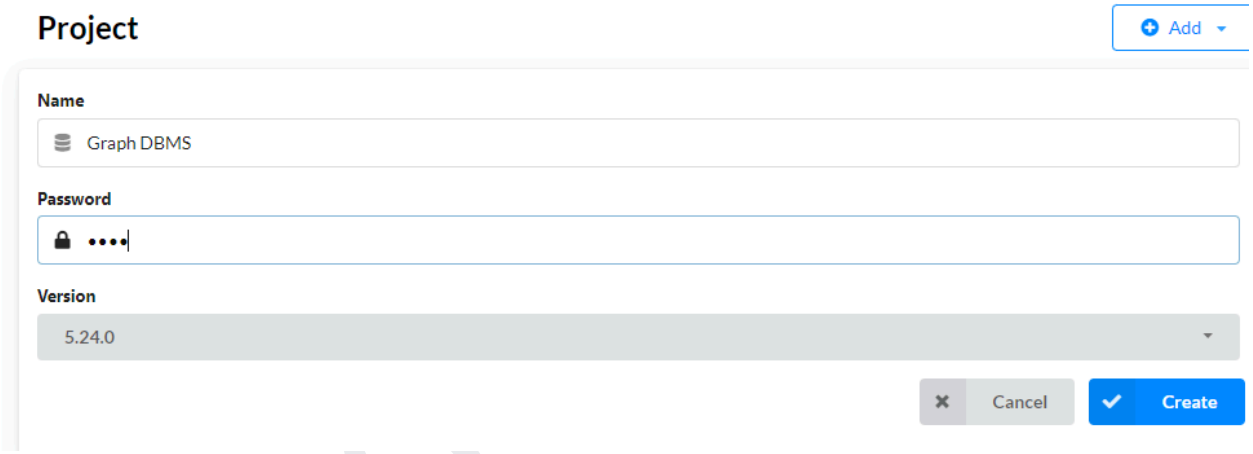
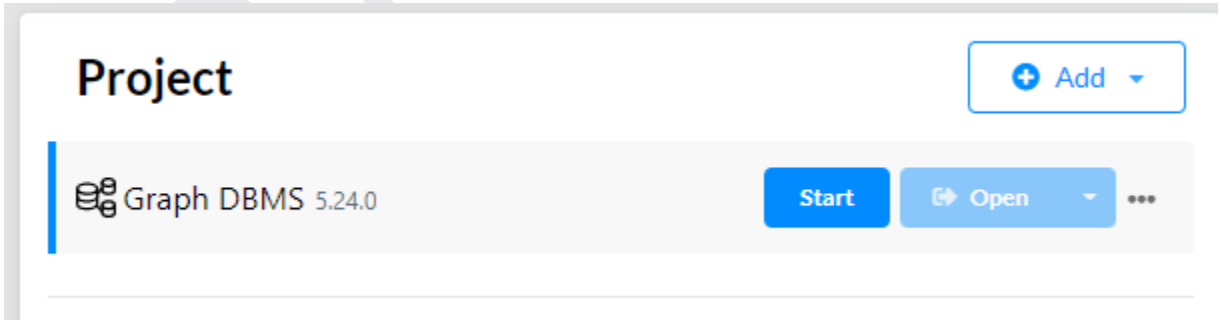
Add DBMS (local DBMS)





Start DBMS



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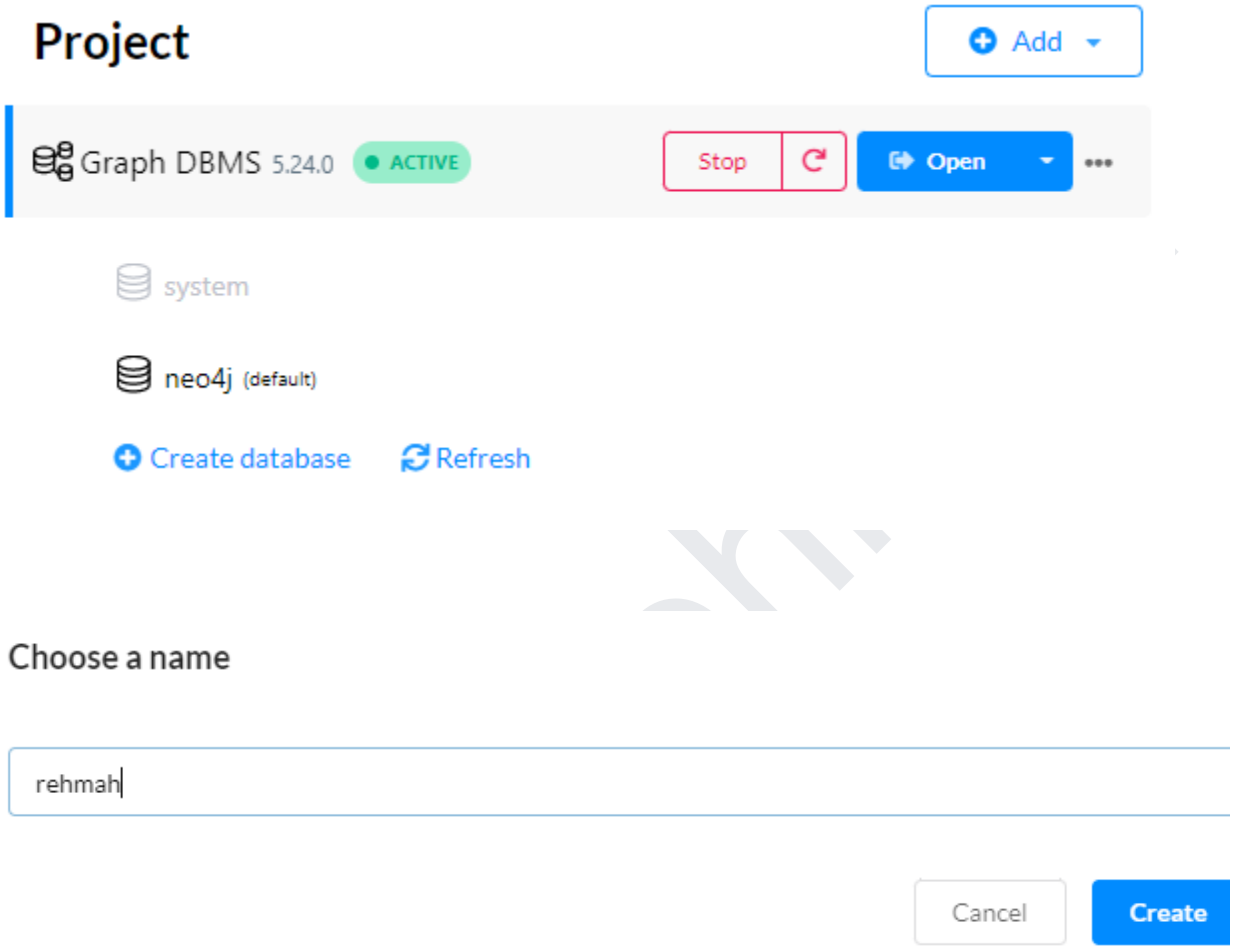
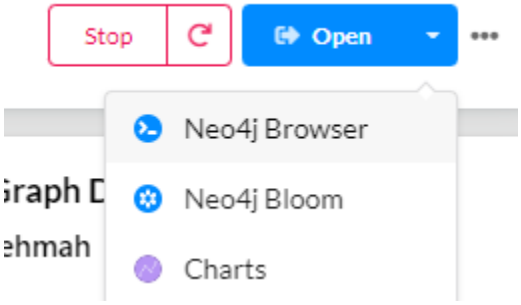
Create Database



Open Neo4J Browser



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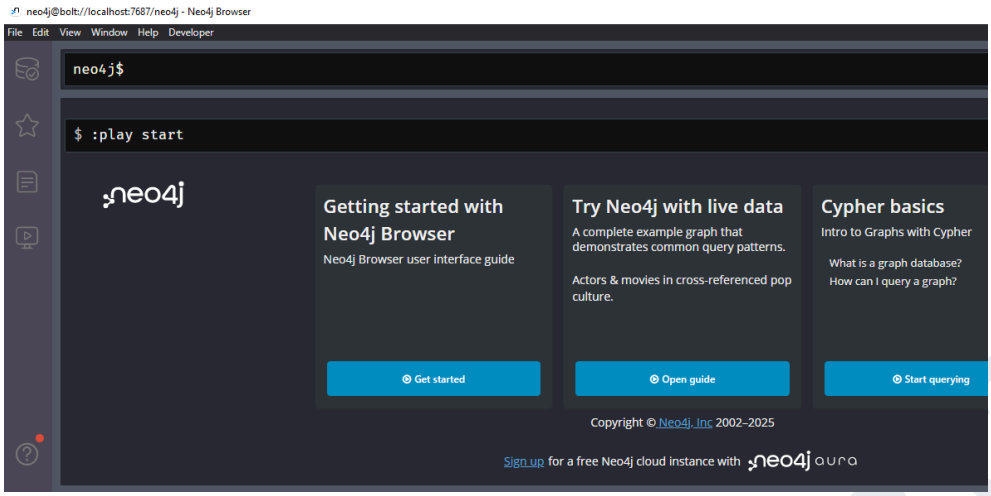
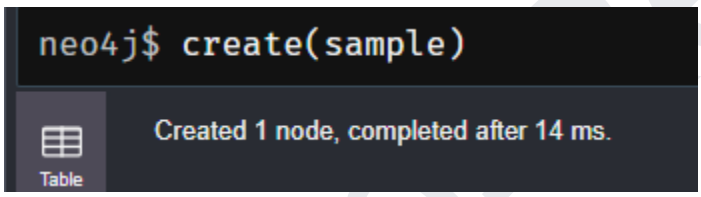


Creating a Node

Creating a Single node

create(sample)



Viewing all nodes

MATCH (n) RETURN n

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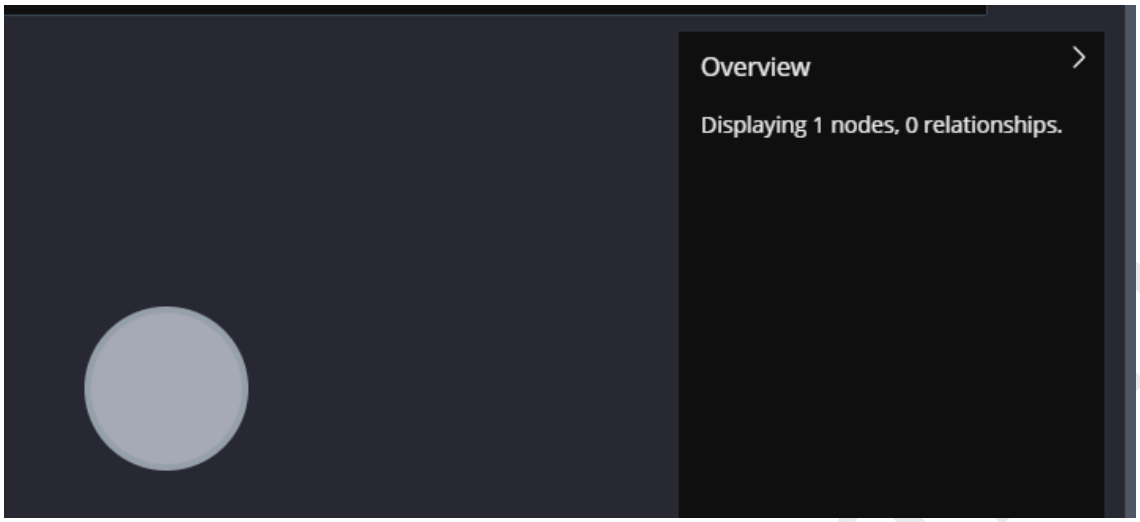
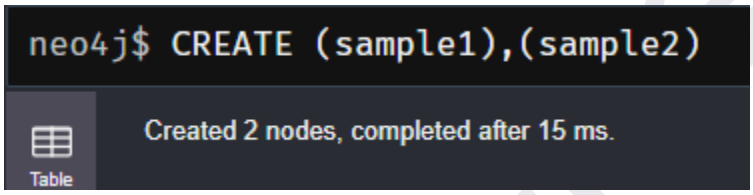


Creating Multiple Nodes

CREATE (sample1),(sample2)



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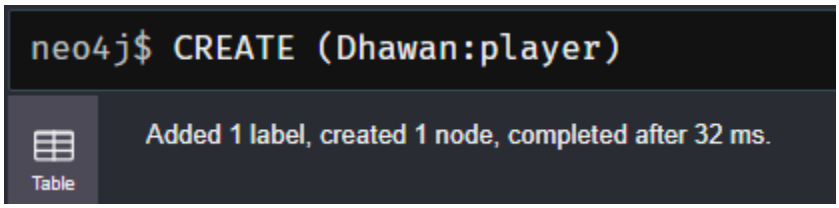
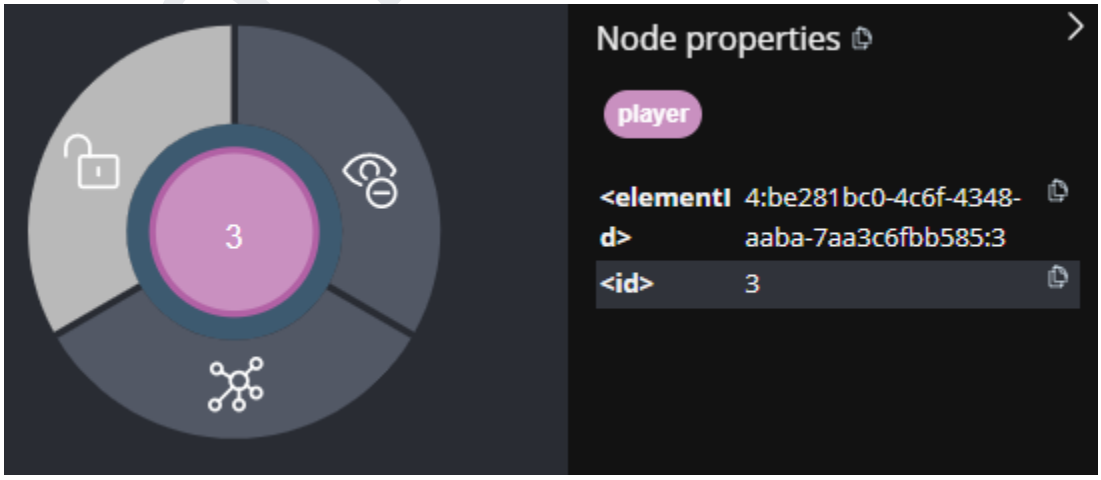
Creating a Node with a Label

CREATE (Dhawan:player)



Click on node to see label



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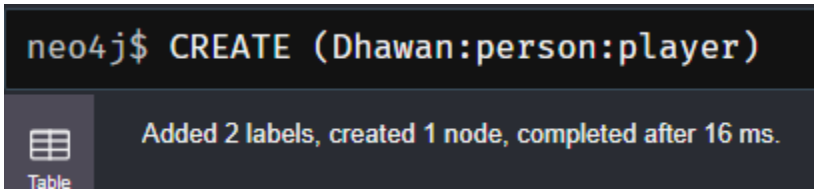
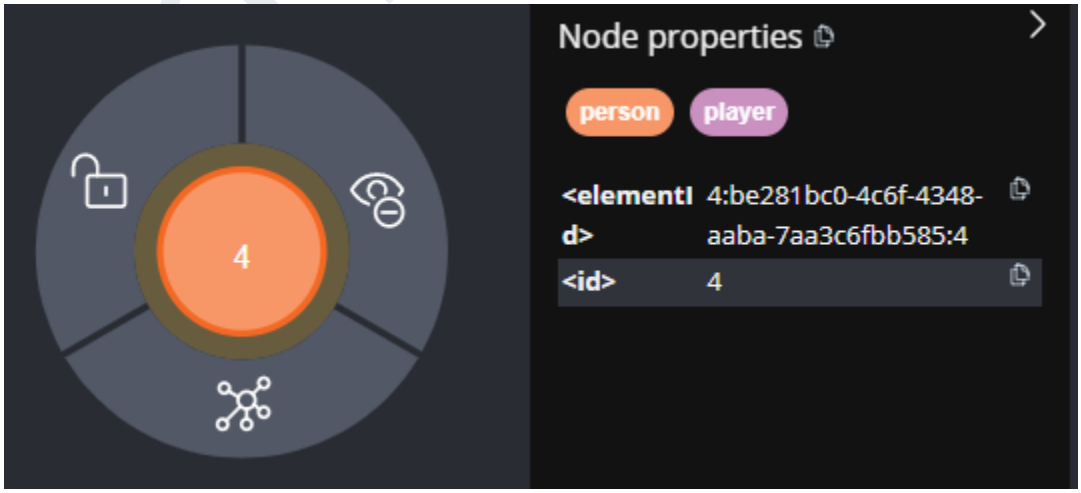
Creating a Node with Multiple Labels

CREATE (Dhawan:person:player)



Click on node to see labels



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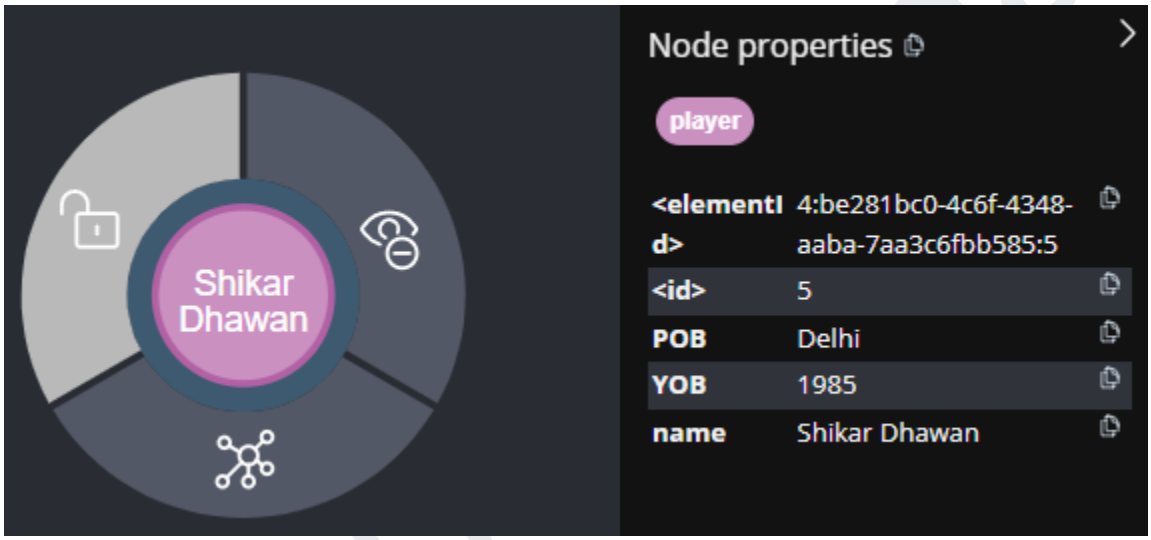
Create Node with Properties

CREATE (Dhawan:player{name: "Shikar Dhawan", YOB: 1985, POB: "Delhi"})

```
neo4j$ CREATE (Dhawan:player{name: "Shikar Dhawan", YOB: 1985, POB: "Delhi"})
```

Added 1 label, created 1 node, set 3 properties, completed after 30 ms.

Match query > click on node



Returning the Created Node

It will create and view the node in the same query. No need to use 'match' query.

'Return' will only show the node mentioned whereas 'match' is used to view all nodes

CREATE (Dhawan:player{name: "Shikar Dhawan", YOB: 1985, POB: "Delhi"}) RETURN Dhawan

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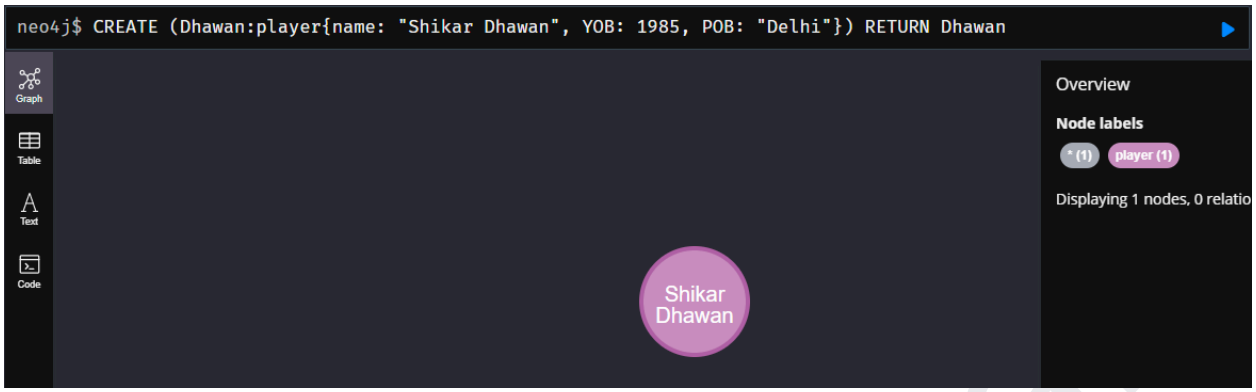
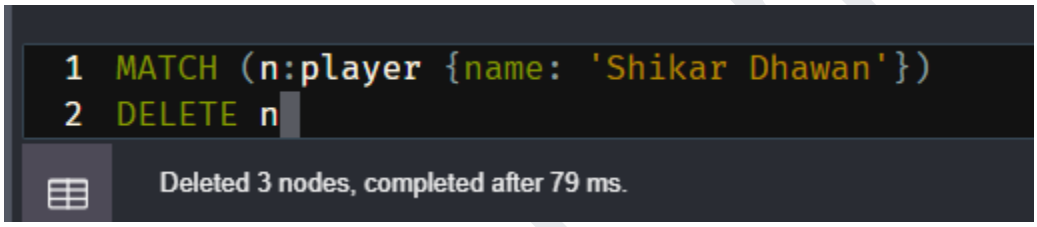


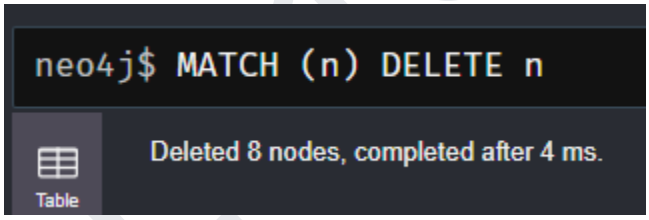
Deleting a Node

MATCH (n:player {name: 'Shikar Dhawan'})
DELETE n



Deleting all Nodes

MATCH (n) DELETE n



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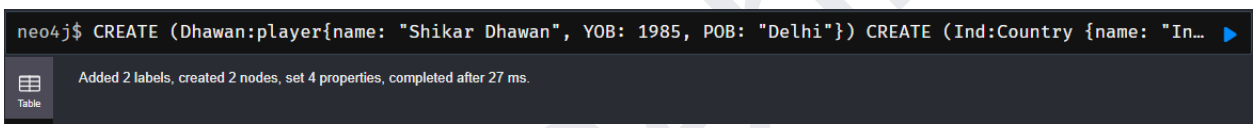
Creating Relationships

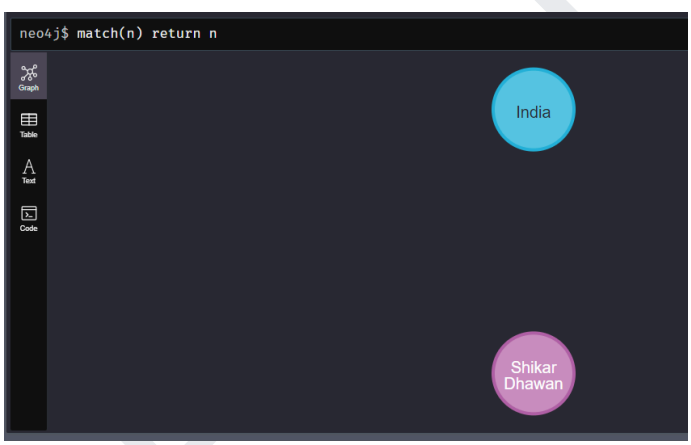
Syntax-

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

CREATE (Dhawan:player{name: "Shikar Dhawan", YOB: 1985, POB: "Delhi"})
CREATE (Ind:Country {name: "India"})



match(n) return n



MATCH (a:player), (b:Country)
WHERE a.name = "Shikar Dhawan" AND b.name = "India"
CREATE (a)-[r:BATSMAN_OF]->(b)
RETURN r

```
MATCH (a:player), (b:Country)
WHERE a.name = "Shikar Dhawan" AND b.name = "India"
CREATE (a)-[r:BATSMAN_OF]→(b)
RETURN r
```

Table | Text | Warn | Code

r

1

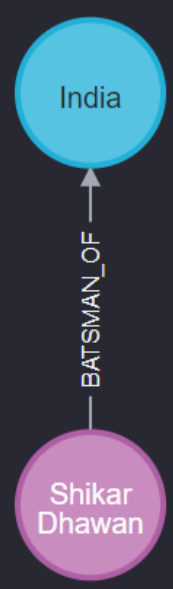

```
{
  "identity": 1152921504606846977,
  "start": 1,
  "end": 2,
  "type": "BATSMAN_OF",
  "properties": {

  },
  "elementId": "5:be281bc0-4c6f-4348-aaba-7aa3c6fbb585:11529215046
  "startNodeElementId": "4:be281bc0-4c6f-4348-aaba-7aa3c6fbb585:1"
  "endNodeElementId": "4:be281bc0-4c6f-4348-aaba-7aa3c6fbb585:2"
```


match(n) return n

```
neo4j$ match(n) return n
```

Graph | Table | Text | Code



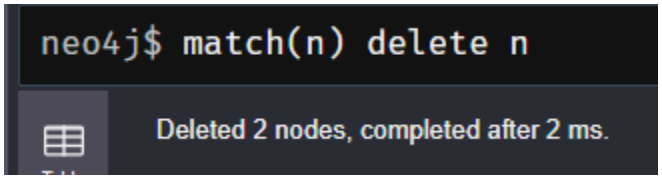
We can't delete nodes which has relationships.
We must delete the relationship first
Then Delete the nodes

Delete a relationship

match(n)-[r:BATSMAN_OF]->() delete r

match(n) delete n

match(n) delete n



Now lets start practical on a clear graph

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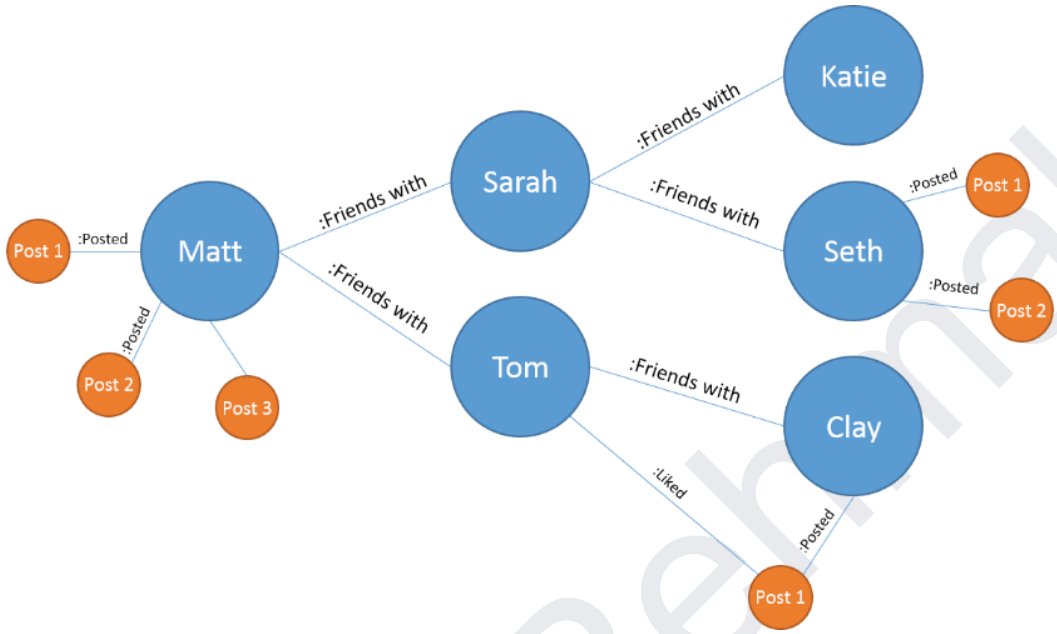
Even Numbers

Using the following database write the queries with Neo4j Cypher to:



e. create the above database.

```
CREATE
  (matt:Person {name: "Matt"}),
  (sarah:Person {name: "Sarah"}),
  (tom:Person {name: "Tom"}),
  (katie:Person {name: "Katie"}),
  (seth:Person {name: "Seth"}),
  (clay:Person {name: "Clay"}),
  (post1_matt:Post {id: "Post 1", author: "Matt"}),
  (post2_matt:Post {id: "Post 2", author: "Matt"}),
  (post3_matt:Post {id: "Post 3", author: "Matt"}),
  (post1_seth:Post {id: "Post 1", author: "Seth"}),
  (post2_seth:Post {id: "Post 2", author: "Seth"}),
  (post1_clay:Post {id: "Post 1", author: "Clay"})
```

```
neo4j$ CREATE (matt:Person {name: "Matt"}), (sarah:Pers
```

Table

Added 12 labels, created 12 nodes, set 18 properties, completed after 60 ms.

MATCH (a:Person), (b:Person)
WHERE a.name = "Matt" AND b.name = "Sarah"
CREATE (a)-[r:FRIENDS_WITH]->(b)
Creates Relationship: Matt - Friends with - Sarah

MATCH (a:Person), (b:Person)
WHERE a.name = "Matt" AND b.name = "Tom"
CREATE (a)-[r:FRIENDS_WITH]->(b)
Creates Relationship: Matt - Friends with - Tom

MATCH (a:Person), (b:Person)
WHERE a.name = "Sarah" AND b.name = "Katie"
CREATE (a)-[r:FRIENDS_WITH]->(b)
Creates Relationship: Sarah- Friends with - Katie

MATCH (a:Person), (b:Person)
WHERE a.name = "Sarah" AND b.name = "Seth"
CREATE (a)-[r:FRIENDS_WITH]->(b)
Creates Relationship: Sarah- Friends with - Seth

MATCH (a:Person), (b:Person)

```
WHERE a.name = "Tom" AND b.name = "Clay"
CREATE (a)-[r:FRIENDS_WITH]->(b)
```

Creates Relationship: Tom- Friends with - Clay

```
MATCH (a:Person), (b:Post)
WHERE a.name = "Matt" AND b.author = "Matt"
CREATE (a)-[r:POSTED]->(b)
```

Creates Relationship:
Matt - Posted - Post1 (author is Matt)
Matt - Posted - Post2 (author is Matt)
Matt - Posted - Post3 (author is Matt)

```
MATCH (a:Person), (b:Post)
WHERE a.name = "Seth" AND b.author = "Seth"
CREATE (a)-[r:POSTED]->(b)
```

Creates Relationship:
Seth- Posted - Post1 (author is Seth)
Seth- Posted - Post2 (author is Seth)

```
MATCH (a:Person), (b:Post), (c:Person)
WHERE a.name = "Clay" AND b.author = "Clay" AND c.name="Tom"
CREATE (a)-[:POSTED]->(b)<-[:LIKED]-(c)
```

Creates Relationship:
Clay- Posted - Post1 (author is Clay)
Tom- Liked - Post1 (author is clay)

```
match(n) return n
```

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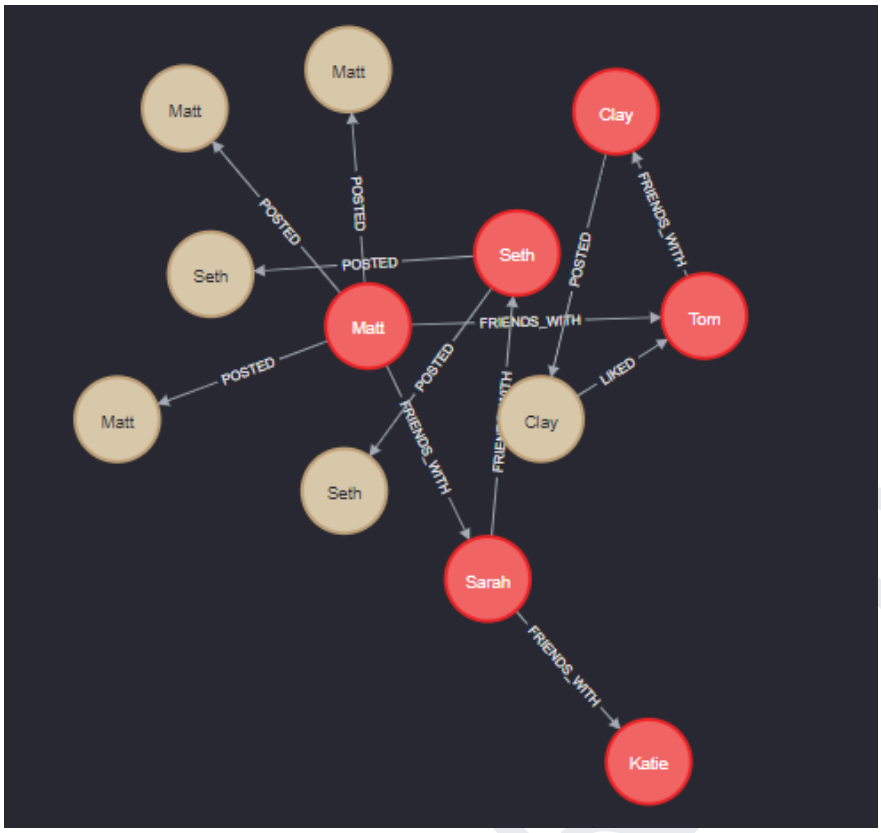
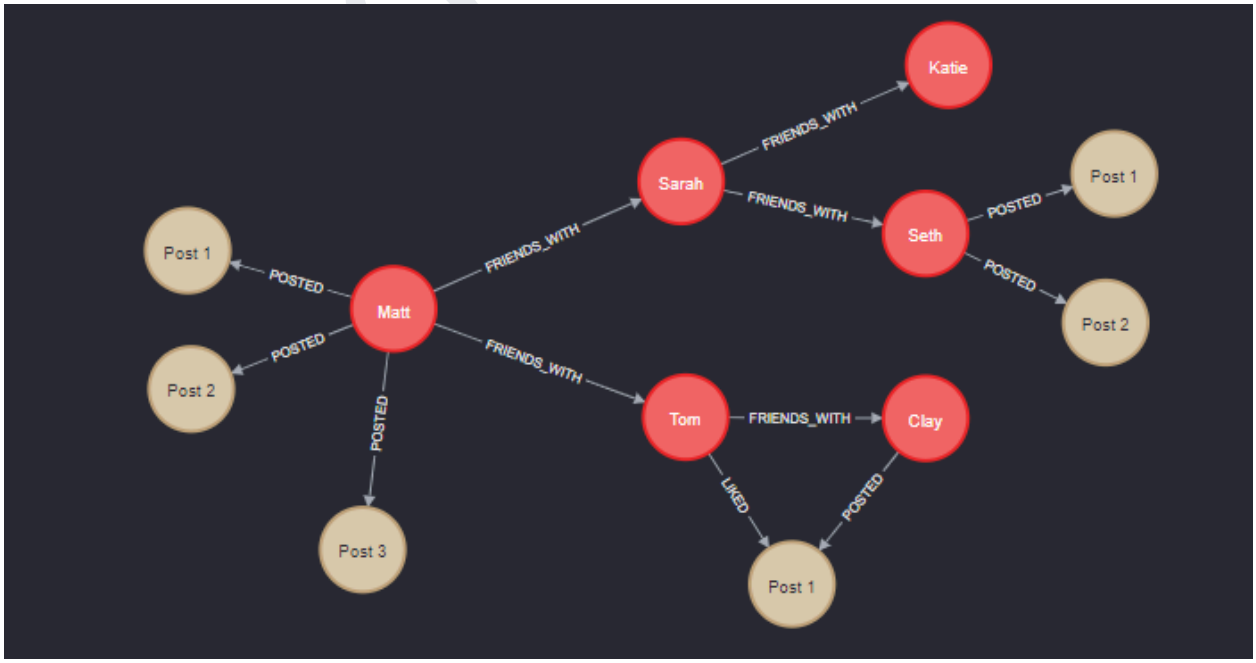


On Rearranging by mouse



f. know that if Katie create any posts?

MATCH (katie:Person {name: "Katie"})-[:POSTED]->(post:Post)
RETURN katie, post

```
neo4j$ MATCH (katie:Person {name: "Katie"})-[:POSTED]→(post:Post) RETURN katie, post
```

Table

(no changes, no records)

Katie did not create any posts

g. Know how many friends does Seth have?

MATCH (seth:Person {name:
"Seth"})-[:FRIENDS_WITH]-(friend:Person)
RETURN count(friend) AS numberOfFriends

```
neo4j$ MATCH (seth:Person {n
```

Table

	numberOfFriends
1	1

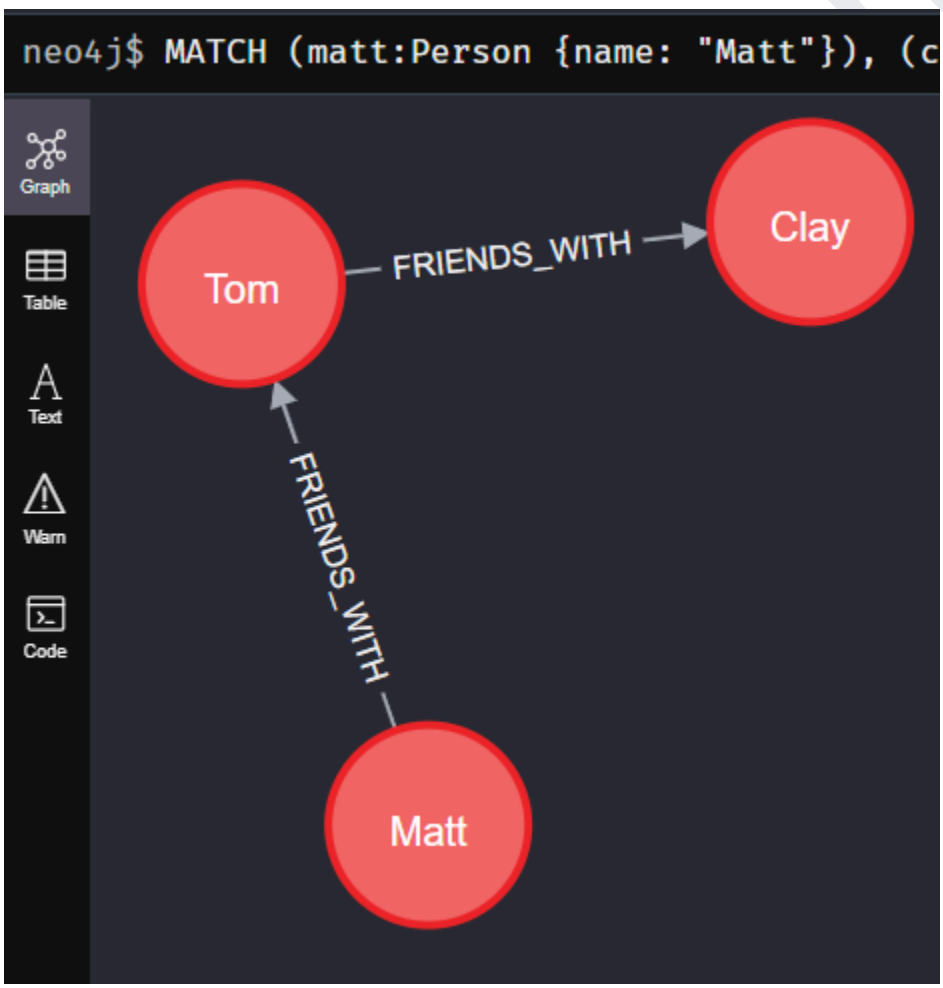
Text

Seth has 1 friend :(

h. Know that is there a path of friendship between Matt and Clay

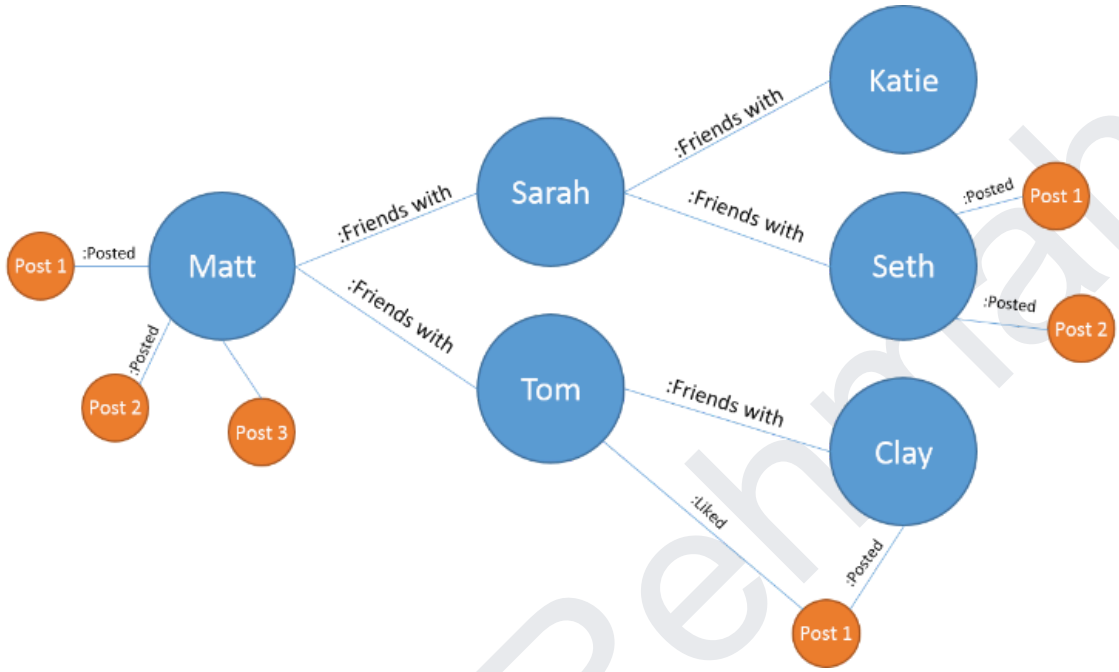
MATCH (matt:Person {name: "Matt"}), (clay:Person {name: "Clay"}),
    p = shortestPath((matt)-[:FRIENDS_WITH*]-(clay))
RETURN p

`MATCH (matt:Person {name: "Matt"})`: This finds the node representing Matt.
`(clay:Person {name: "Clay"})`: This finds the node representing Clay.
`p = shortestPath((matt)-[:FRIENDS_WITH*]-(clay))`: This attempts to find the shortest path `p` between Matt and Clay, considering only `FRIENDS_WITH` relationships. The `*` allows for paths of any length.
`RETURN p`: This returns the shortest path found.



Odd Numbers

Using the following database write the queries with Neo4j Cypher to:

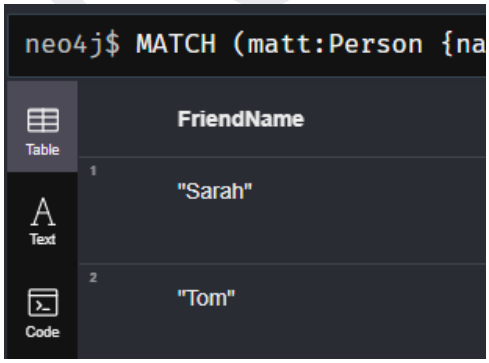


a. create the above database.

Refer Previous Question

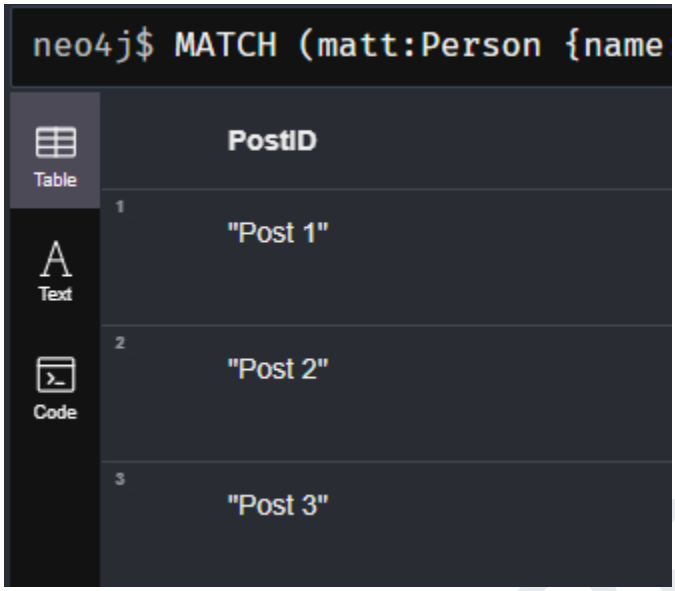
b. Know who are Matt's friends?

MATCH (matt:Person {name: "Matt"})-[:FRIENDS_WITH]-(friend:Person)
RETURN friend.name AS FriendName



c. Know what posts did Matt create?

MATCH (matt:Person {name: "Matt"})-[:POSTED]->(post:Post)
RETURN post.id AS PostID



d. Know which person liked Post 1

MATCH (post:Post {id: "Post 1"})<-[:LIKED]-(person:Person)
RETURN person.name AS PersonLikedPost