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Neo4j: Find set of nodes that all nodes point to



To be more precise, suppose you have People and Animal nodes, and a `:likes` relationship from Person to Animal. The question is: How can I find all the Animal s that **ALL** the people like?

Example:

```
(Person {name: "Jake"})-[:likes]->(Animal {name: "Dog"})
(Person {name: "Maya"})-[:likes]->(Animal {name: "Dog"})
(Person {name: "Maya"})-[:likes]->(Animal {name: "Snake"})
(Person {name: "Jake"})-[:likes]->(Animal {name: "Cat"})
```

If Jake and Maya are the universe of people, the set of Animals that both Jake and Maya like contains only Dogs.

neo4j

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asked Apr 9 at 23:02

Jake
4,727 15 44 72

2 Answers

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With this example dataset:

```
CREATE (jake:Person {name:'Jake'}),
       (maya:Person {name:'Maya'}),
       (dog:Animal {name:'Dog'}),
       (snake:Animal {name:'Snake'}),
       (cat:Animal {name:'Cat'}),
       (jake)-[:LIKES]->(dog),
       (jake)-[:LIKES]->(cat),
       (maya)-[:LIKES]->(dog),
       (maya)-[:LIKES]->(snake)
```

I think the following reads nicely:

```
MATCH (p:Person)
MATCH (a:Animal)

WITH a, COLLECT(p) AS people
WHERE ALL(p IN people WHERE (p)-[:LIKES]->(a))
RETURN a.name
```

<http://console.neo4j.org/r/vu3vxp>

But it's not as fast as:

```
MATCH (p:Person)
WITH COUNT(p) AS people

MATCH (p:Person)-[:LIKES]->(a:Animal)
WITH a, COUNT(p) AS likes, people
WHERE likes = people
```

asked 4 months ago

viewed 35 times

active 4 months ago

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```
WHERE likes = people
RETURN a.name
```

<http://console.neo4j.org/r/nnrvj2>

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answered Apr 9 at 23:51



Nicole White
3,059 ● 4 ● 15

This works, thanks! – [Jake](#) Apr 10 at 3:53

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1



The set of animals (call it "A") that all people like must be either the same as or a subset of the set of animals that a **single** person likes. So, we can speed up the search for A by testing just the animals that a random Person likes.

The following query counts the number of people (np), gets the set of animals that a single person likes (ca), and returns the animals in that set (if any) that are liked by np people.

```
MATCH (p:Person)
WITH COUNT(p) AS np

MATCH (p:Person)-[:LIKES]->(a:Animal)
WITH p, COLLECT(a) AS ca, np
LIMIT 1

UNWIND ca AS a
MATCH (x:Person)-[:LIKES]->(a)
WITH a, COUNT(x) AS nx, np
WHERE nx = np
RETURN COLLECT(a) AS result;
```

share improve this answer

answered Apr 10 at 2:43



cybersam
9,941 ● 2 ● 7 ● 21

This is great, thanks! Going with the other answer for terseness. – [Jake](#) Apr 10 at 3:53

Although this query is longer, it should be faster... – [cybersam](#) Apr 10 at 4:45


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