Neo4j Cypher traversal - find path by multiple relationship types

asked 4 months ago

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I have a schema, where nodes are connected by 2 types of relationship - r:A and r:B. I'm trying to write a pattern, which will find every path from node N to node M. This can be simply done by following cypher query:

```
match path = (n)-[:A|:B*]->(m) return path;
```

Unfortunately this is not what I need exactly. I need to find every path from (n) to (m) where depth via relation r:A can be infinite, but along the way only limited number of r:B relations can be use. In happy day scenario the cypher query would look like this:

```
match path = (n)-[:A*|:B*0..3]->(m) return path;
```

However cypher does not allow this syntax. I can't solve this problem even with usage of another "helping" node on the way:

```
match path = (n)-[:A*]->()-[:B*0..3]->(m) return path;
```

This does not match my need also, because the nodes can be interconnected in any possible way. For example:

```
(n)-[r:A]-()-[r:A]-()-[r:A]-(m)
(n)-[r:A]-(m)
(n)-[r:A]-()-[r:B]-()-[r:A]-()-[r:B]-()-[r:A]-()-[r:A]-(m)
```

Is there a way how this can be achieved? If not in cypher, can it be done in gremlin / neo4j traversal api / embedded functions of spring data neo4j project?

Thank's for the answers.

java neo4j cypher traversal

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asked Mar 27 at 22:51
Jakub Chalupa
8 ● 2

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Try this:

```
MATCH path = (n)-[:A|:B*]->(m)
WITH path, relationships(path) AS r, filter(rel in relationships(path)
WHERE type(rel) = 'B') AS Brels
WITH path, reduce(Bcount = 0, rel IN Brels | Bcount + 1) AS Bcount
WHERE Bcount <= 3
RETURN path
```

I don't know if I understand the question completely clear. Just let me know.

EDIT:
I added the second query after comments. This solution is ugly but it is good workaround.

```
MATCH path = (n)-[:A|:B*]-(m)
WITH path, filter(rel in relationships(path) WHERE type(rel) = 'B') AS Brels
WITH path, reduce(Bcount = 0, rel IN Brels | Bcount + 1) AS Bcount
WHERE Bcount <= 3
WITH path, relationships(path) AS rels
WITH path, rels, reduce(count = 0, rel IN rels | count + 1) AS count
WITH path, rels, range(0,count-1) as counter
WITH path, reduce(x = 0, c IN counter |
CASE WHEN (type(rels[c])='B' AND type(rels[c+1])='B') THEN x+200000 ELSE x+1 END) AS
countX
WHERE countX<200000
RETURN path, countX
```

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edited Mar 28 at 20:32

answered Mar 28 at 10:26
Richard Günzl
104 ● 5

1 Yes, this answers my question - thanks a lot. Unfortunately, if I'm not mistaken, the algorithm will firstly find all possible ways (even the paths, where more then 3 r:B relations were used) and filter the results afterwards? I'd appreciate, if the search would not even follow any path with more then 3 r:B relations. In addition - is it possible to say, that I want use only one r:B relation at a time? - This means, that (n)-[:B]-()-[:B]-(m) is not the result I want, because the path follows two :B relations consecutively. In other words - if r:B relation was used, next relation MUST be r:A. – Jakub Chalupa Mar 28 at 18:38

Kubo, yes, the algorithm is not the best solution. I'm afraid, you will need another method of querying than Cypher, because your scenarios are complicated, but you mentioned in the question. I will add the second cypher query to the answer which can help you. – Richard Günzl Mar 28 at 20:24

@JakubChalupa : I forgot to mention your username in the comment. I fix it here. – Richard Günzl Mar 30 at 10:29

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