

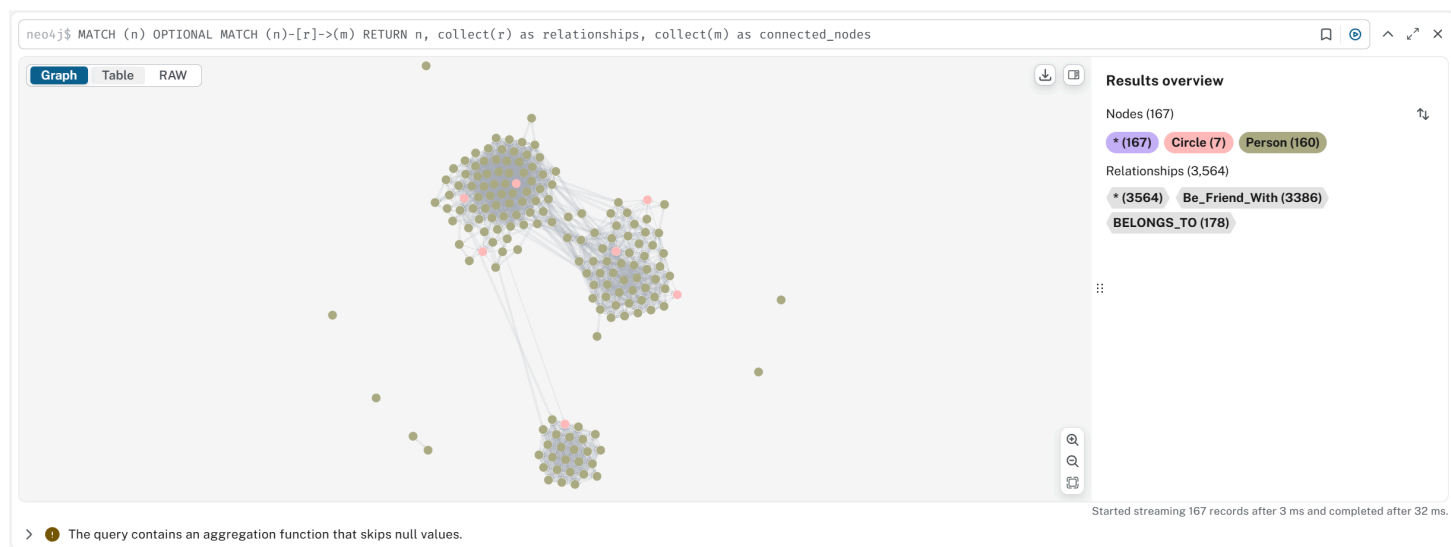
Cypher查询

说明：在我创建和导入的数据库当中，对于变量名当中的；，我都替换为 -。

e.g. education;concentration;id \implies education-concentration-id

选择了最小的ego网络（编号：414）

整个图数据库的点 and 边如下：

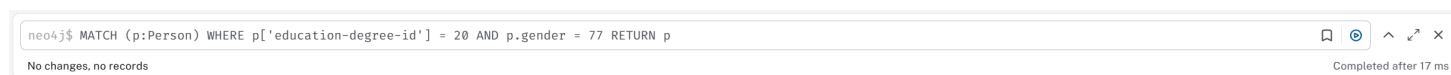


1. 检索所有gender属性为77且education-degree-id为20的Person；

查询语句：

```
MATCH (p:Person)
WHERE p['education-degree-id'] = "20" AND p.gender = "77"
RETURN p
```

结果：



2. 检索所有gender属性为78且education;degree;id为20或22的Person；

查询语句：

```
MATCH (p:Person)
WHERE p.gender = "78"
AND (p['education-degree-id'] = "20" OR p['education-degree-id'] = "22")
RETURN p
```

结果：

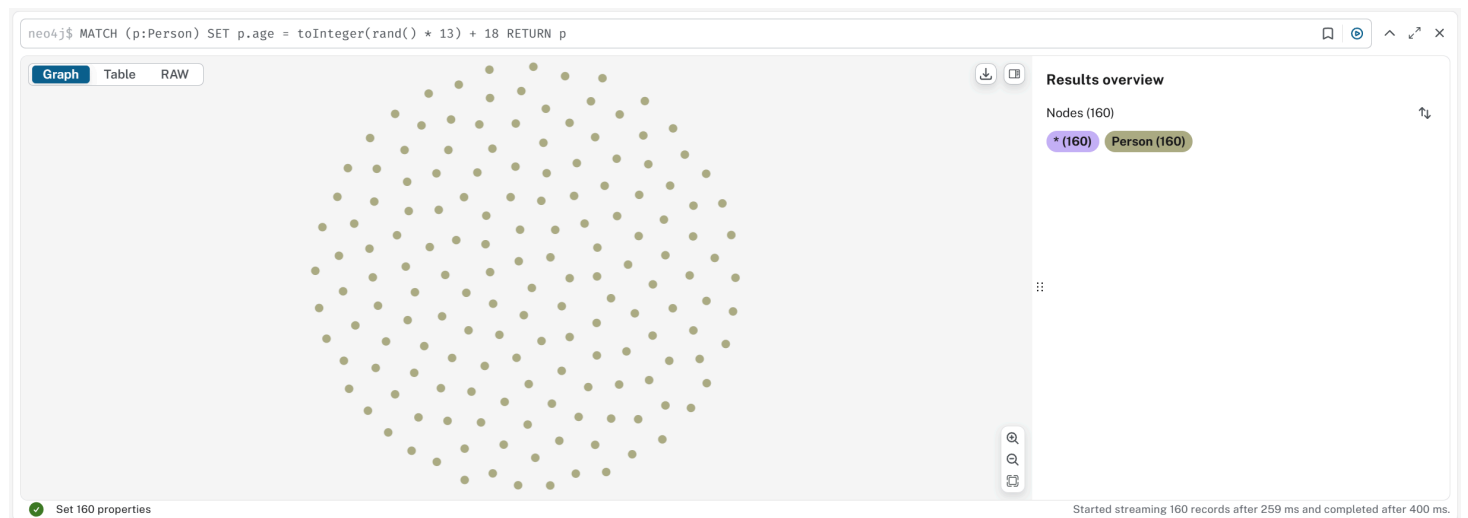


3. 为Person增设年龄age属性，数值自行设定，可以随机化，要求年龄介于18岁-30岁之间，尽量分布均匀；

查询语句：

```
MATCH (p:Person)
SET p.age = toInteger(rand() * 13) + 18
RETURN p
```

结果：



4. 检索每个Person的朋友的数量；

查询语句：

```
MATCH (p:Person)-[:Be_Friend_With]->(friend:Person)
RETURN p.id AS person, count(friend) AS friend_count
ORDER BY friend_count DESC
```

结果：

neo4j\$ MATCH (p:Person)-[:Be_Friend_With]->(friend:Person) RETURN p.id AS person, count(friend) AS friend_count ORDER BY friend_count DESC

Table RAW

person	friend_count
1 "376"	57
2 "373"	53
3 "513"	49
4 "428"	48
5 "483"	47
6 "591"	45
7 "348"	45
8 "559"	45
9 "436"	44
10 "475"	44

Started streaming 150 records after 15 ms and completed after 19 ms.

5. 检索朋友平均年龄值在25岁以下的Person集合；
查询语句：

```
MATCH (p:Person)-[:Be_Friend_With]->(friend:Person)
WITH p, avg(friend.age) AS avg_friend_age
WHERE avg_friend_age < 25
RETURN p.id AS person, avg_friend_age
ORDER BY avg_friend_age
```

结果：

neo4j\$ MATCH (p:Person)-[:Be_Friend_With]->(friend:Person) WITH p, avg(friend.age) AS avg_friend_age WHERE avg_friend_age < 25 RETURN p.id AS person, avg_friend_age ORDER BY avg_friend_age

Table RAW

person	avg_friend_age
1 "642"	18.0
2 "649"	20.0
3 "34"	20.666666666666668
4 "593"	21.5
5 "427"	22.4
6 "667"	22.5
7 "601"	22.5625
8 "480"	22.666666666666668
9 "617"	22.7083333333333325
10 "657"	22.833333333333332

Started streaming 114 records after 99 ms and completed after 123 ms.

6. 检索年龄最大的前10个Person；
查询语句：

```
MATCH (p:Person)
RETURN p.id AS person, p.age AS age
ORDER BY age DESC
LIMIT 10
```

结果：

person	age
1 "658"	30
2 "672"	30
3 "639"	30
4 "376"	30
5 "604"	30
6 "667"	30
7 "608"	30
8 "475"	30
9 "614"	30
10 "599"	29

Started streaming 10 records after 73 ms and completed after 80 ms.

7. 删除所有年龄为18和19的Person（删除之前请注意截图）

查询语句：

删除前查询这些符合条件的点

```
MATCH (p:Person)
WHERE p.age = 18 OR p.age = 19
RETURN p
```

执行删除

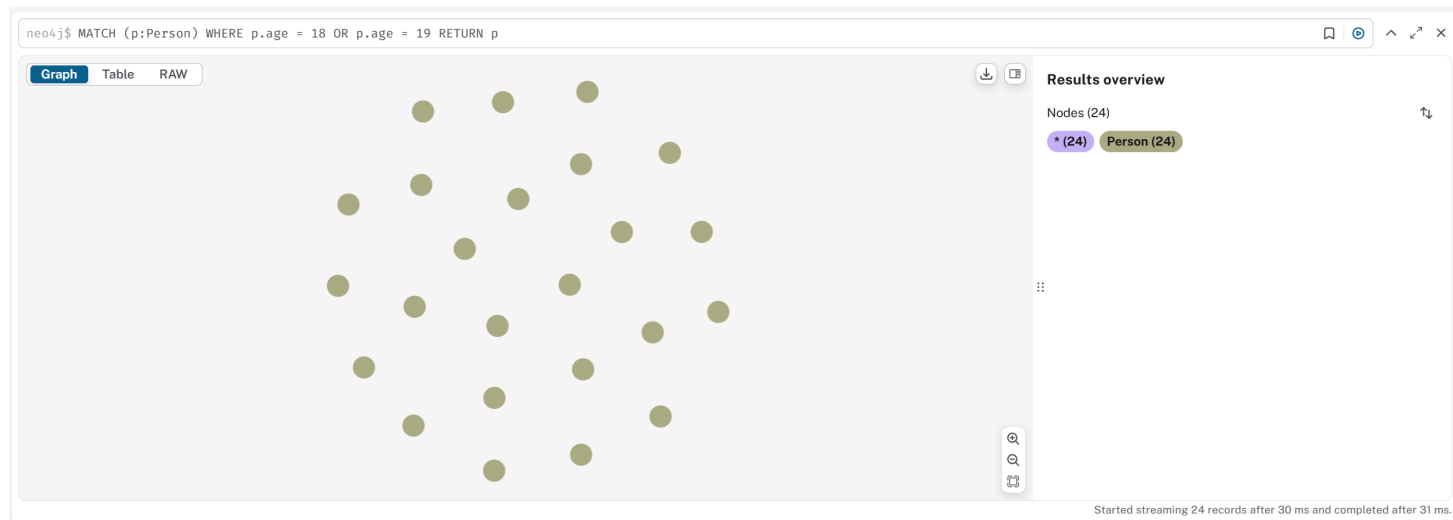
```
MATCH (p:Person)
WHERE p.age = 18 OR p.age = 19
DETACH DELETE p
```

删除后再查一次

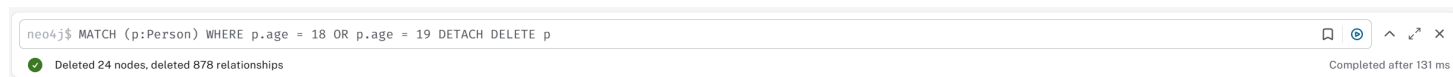
```
MATCH (p:Person)
WHERE p.age = 18 OR p.age = 19
RETURN p
```

结果：

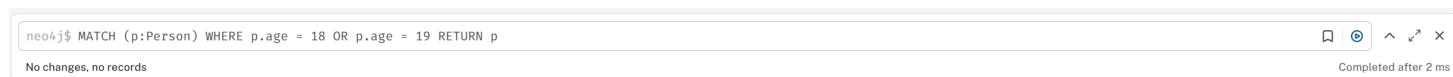
删除前：



删除后：



删除后再查一次：



8. 检索某个Person的所有朋友和这些朋友的所有朋友；

查询语句：

先找找有哪些id

```
MATCH (p:Person) RETURN p.id
```

然后挑一个id，执行查询，这里选id为573的Person，为了直观，我选择输出从573开始的所有路径

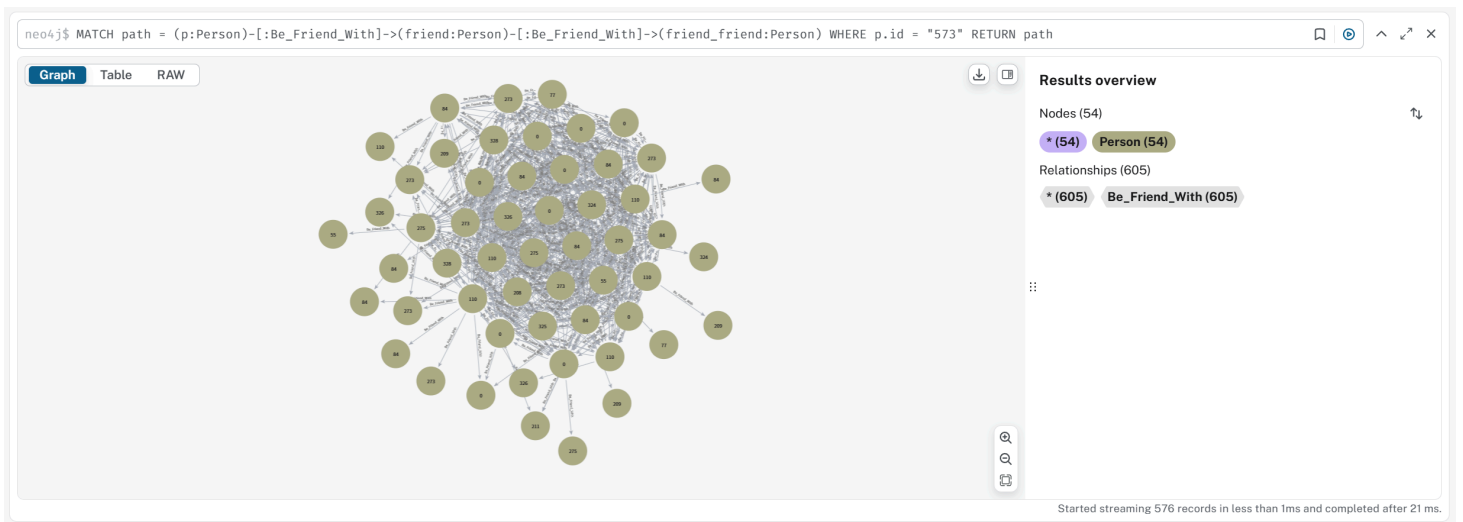
```
MATCH path = (p:Person)-[:Be_Friend_With]->(friend:Person)-[:Be_Friend_With]->(friend_friend:Person)
WHERE p.id = "573"
RETURN path
```

结果：

neo4j\$ MATCH (p:Person) RETURN p.id

	p.id
1	"573"
2	"574"
3	"576"
4	"577"
5	"578"
6	"579"
7	"580"
8	"582"
9	"583"
10	"584"

Started streaming 136 records after 1 ms and completed after 1 ms.



9. 检索某个Person的所有朋友集合和其所在的circle的所有Person集合；

查询语句：

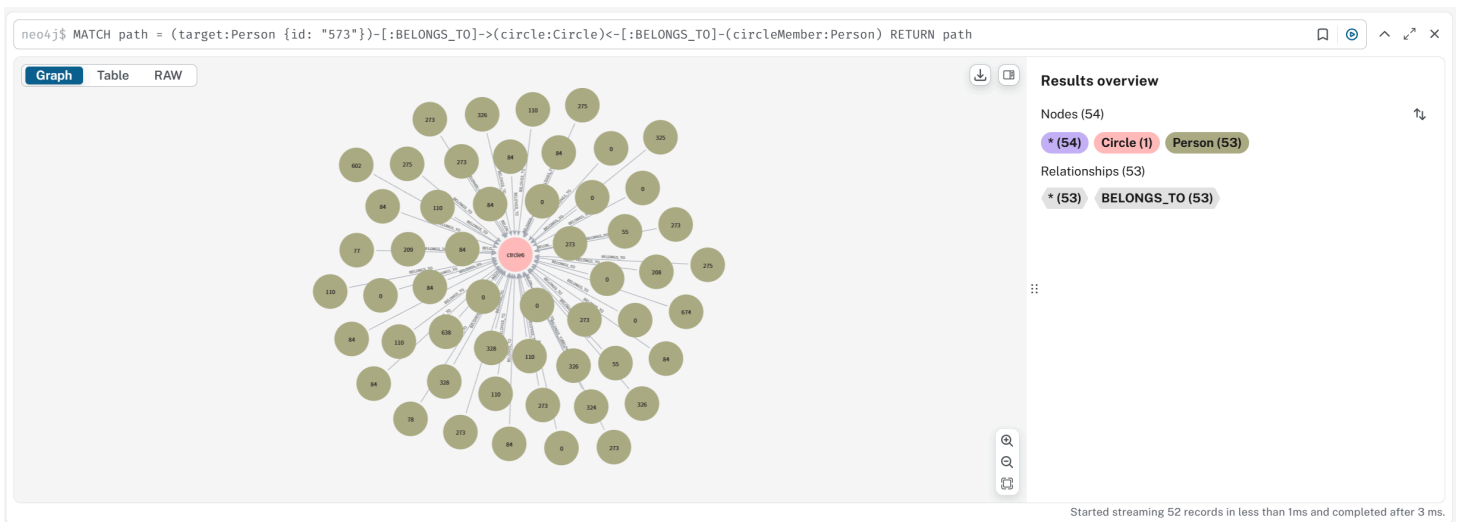
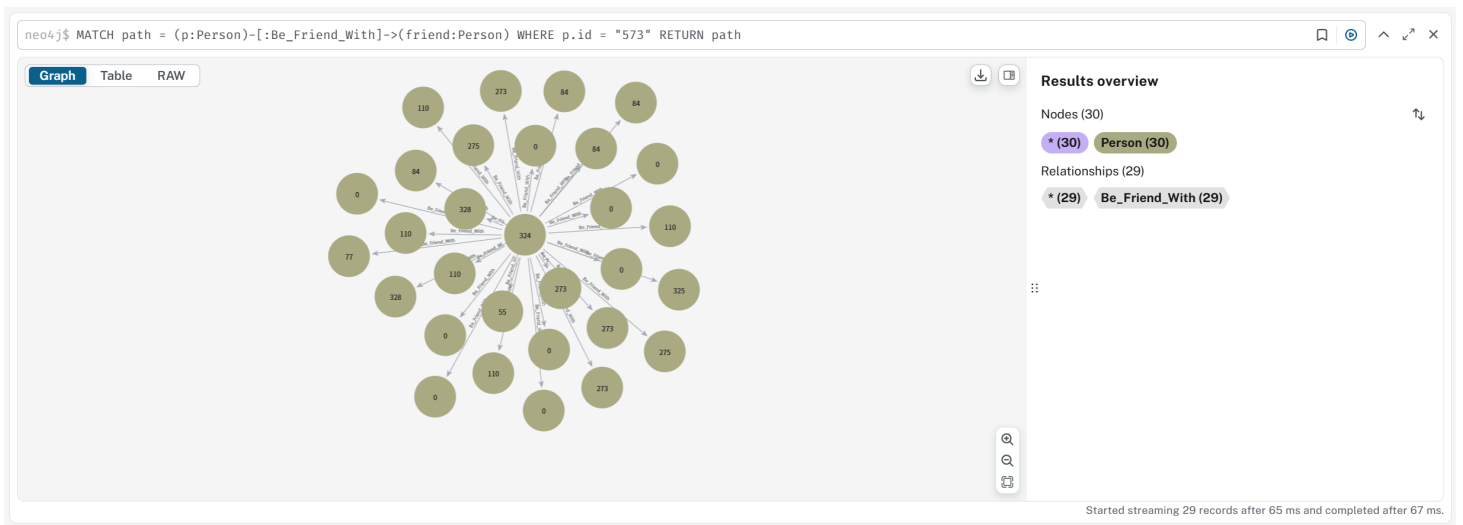
选择上面一样的id，573，稍微修改一下就得到了573这个Person的朋友集合

```
MATCH path = (p:Person)-[:Be_Friend_With]->(friend:Person)
WHERE p.id = "573"
RETURN path
```

circle的所有集合，为了直观，我选择返回的是path，这样能产生一个点和边的图

```
MATCH path = (target:Person {id: "573"})-[:BELONGS_TO]->(circle:Circle)-[:BELONGS_TO]-(circleMember:Person)
RETURN path
```

结果：



10. 任选三对Person，查找每一对Person间的最短关系链（即图模型的最短路）；

查询语句：

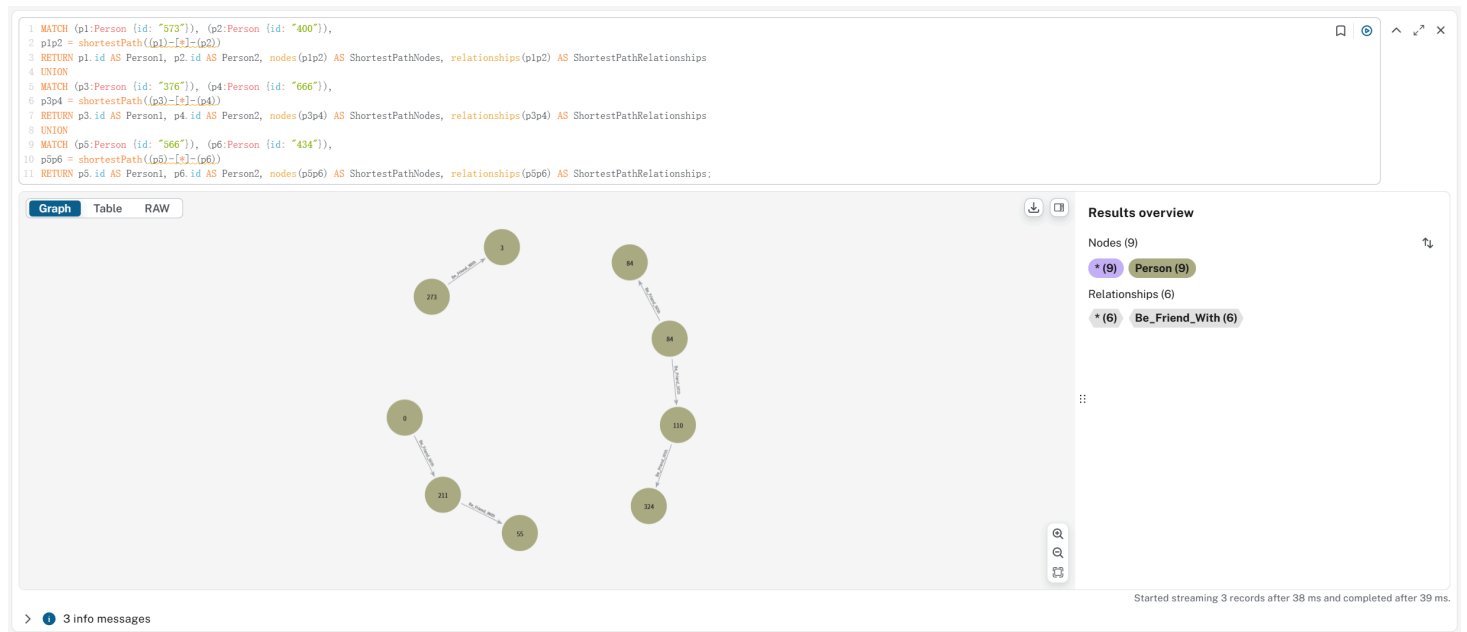
先挑6个id，然后相邻的两个凑成一对：573, 400, 376, 666, 566, 434（也不知道通不通）

```
MATCH (p1:Person {id: "573"}), (p2:Person {id: "400"}),
p1p2 = shortestPath((p1)-[*]-(p2))
RETURN p1.id AS Person1, p2.id AS Person2, nodes(p1p2) AS ShortestPathNodes, relationships(p1p2)
UNION
MATCH (p3:Person {id: "376"}), (p4:Person {id: "666"}),
p3p4 = shortestPath((p3)-[*]-(p4))
RETURN p3.id AS Person1, p4.id AS Person2, nodes(p3p4) AS ShortestPathNodes, relationships(p3p4)
UNION
MATCH (p5:Person {id: "566"}), (p6:Person {id: "434"}),
p5p6 = shortestPath((p5)-[*]-(p6))
RETURN p5.id AS Person1, p6.id AS Person2, nodes(p5p6) AS ShortestPathNodes, relationships(p5p6)
```

但是neo4j也给出了三个info：

- 三个查询没有限制路径的长度，可能导致较长的查询时间
所以它建议对路径最大长度做出限制，比如限制最大路径长度为10，
即： `MATCH path = shortestPath((p1)-[*..10]-(p2))`
但是鉴于第一次跑就成功跑出来了，所以我就不再尝试了。

结果：



11. 对于人数少于两个的circle，删除掉这些circle里的Person的表示circle信息的属性；

不是很理解这道题，因为Person里面没有这类信息，Person和circle只是有个 `BELONGS_TO` 的关系，那就删关系吧，然后这个数据集circle没有人数是小于2个的，所以我就挑人数最小的circle，然后删掉这个circle和 `BELONGS_TO` 关系，保持Person不动。

查询语句：

首先先找到人数最少的circle

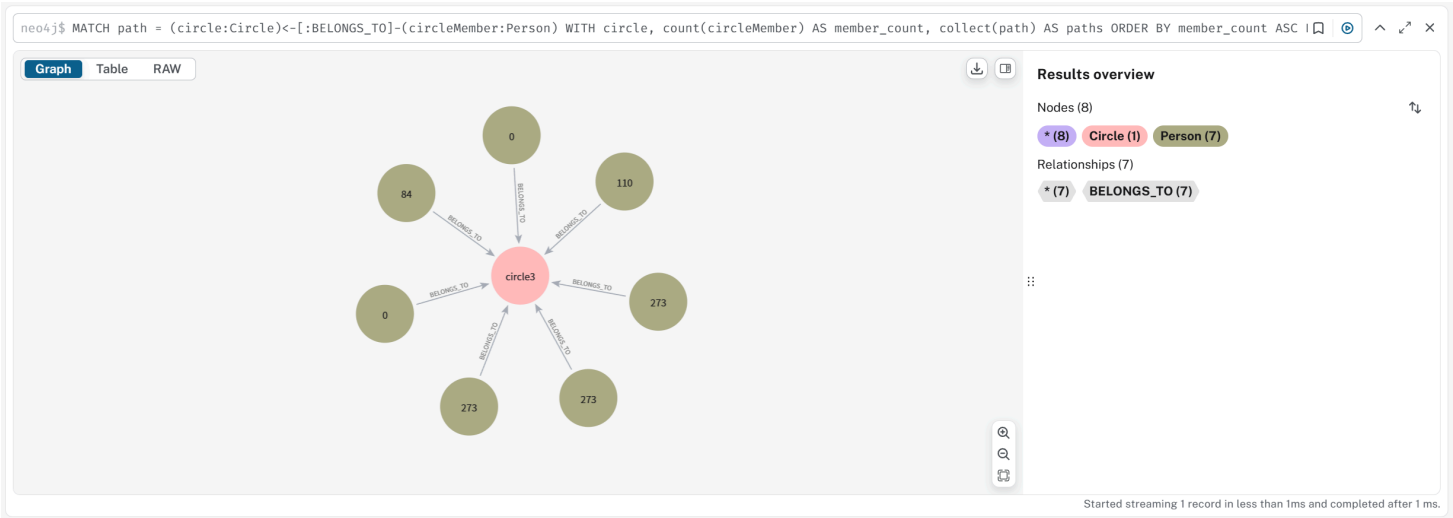
```
MATCH path = (circle:Circle)<-[:BELONGS_TO]-(circleMember:Person)
WITH circle, count(circleMember) AS member_count, collect(path) AS paths ORDER BY member_count
LIMIT 1
RETURN paths
```

然后删掉circle和对应Person的关系

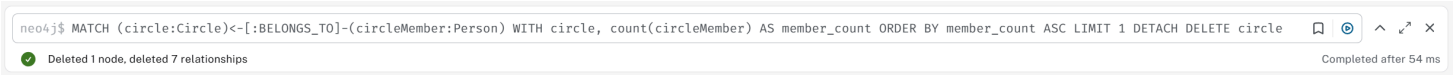
```
MATCH (circle:Circle)<-[:BELONGS_TO]-(circleMember:Person)
WITH circle, count(circleMember) AS member_count
ORDER BY member_count ASC
LIMIT 1
DETACH DELETE circle
```


结果：

先找到数量最少的circle：



然后删掉这个circle：



12. 按年龄排序升序所有Person后，再按hometown;id属性的字符串值降序排序，然后返回第5、6、7、8、9、10名Person，由于一些节点的hometown;id可能是空的（即没有这个属性），对于null值的节点要从排序列表里去掉；

查询语句：

```
MATCH (p:Person)
WHERE p['hometown-id'] IS NOT NULL
WITH p
ORDER BY p.age ASC, p['hometown-id'] DESC
SKIP 4
LIMIT 6
RETURN p.id, p.age, p['hometown-id']
```

结果：

neo4j\$ MATCH (p:Person) WHERE p['hometown-id'] IS NOT NULL WITH p ORDER BY p.age ASC, p['hometown-id'] DESC SKIP 4 LIMIT 6 RETURN p.id, p.age, p['hometown-id']

Table RAW

	p.id	p.age	p['hometown-id']
1	"609"	21	"84"
2	"603"	21	"84"
3	"578"	22	"84"
4	"654"	22	"84"
5	"394"	22	"84"
6	"629"	22	"84"

Started streaming 6 records in less than 1ms and completed after 1 ms.

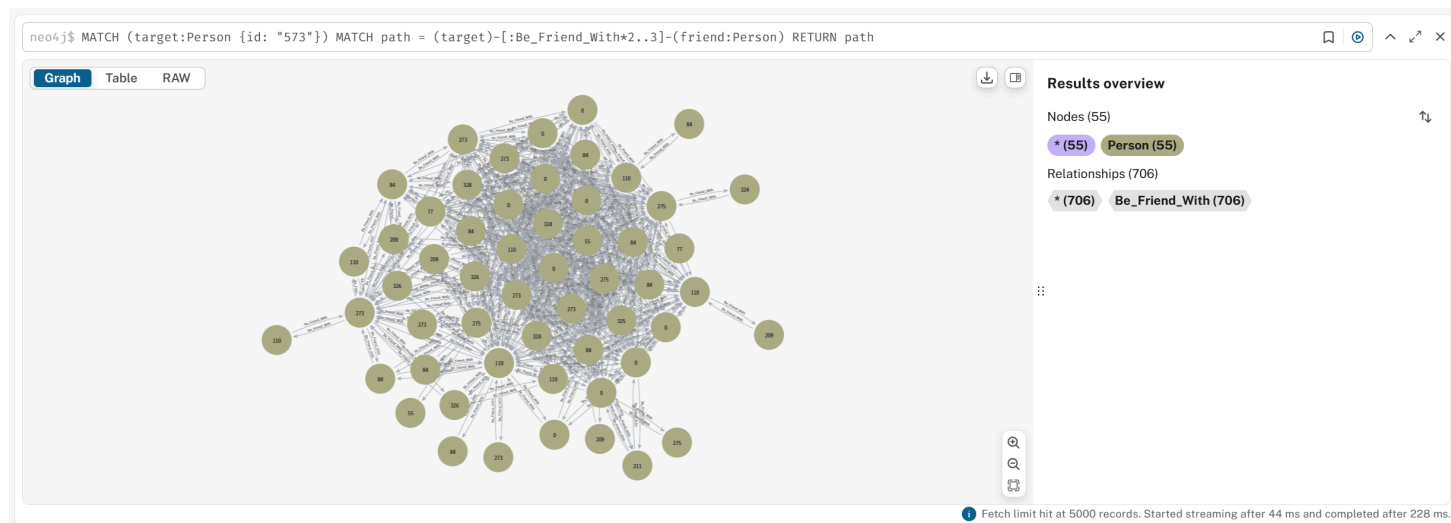
13. 检索某个Person的二级和三级朋友集合（A的直接朋友（即有边连接）的称之为一级朋友，A的N级朋友的朋友称之为N+1级朋友，主要通过路径长度来区分，即A的N级朋友与A的所有路径中，有一条长度为N）

查询语句：

这里也选择id为573的Person

```
MATCH (target:Person {id: "573"})
MATCH path = (target)-[:Be_Friend_With*2..3]-(friend:Person)
RETURN path
```

结果：



14. 获取某个Person的所有朋友的education;school;id属性的list;

查询语句：

这里也是选id为573

```
MATCH (target:Person {id: "573"})-[:Be_Friend_With]-(friend:Person)
WITH friend, friend['education-school-id'] AS schoolId
RETURN friend.id AS friendId, schoolId
```

结果：

```
1 MATCH (target:Person {id: "573"})-[:Be_Friend_With]-(friend:Person)
2 WITH friend, friend['education-school-id'] AS schoolId
3 RETURN friend.id AS friendId, schoolId
```

friendId	schoolId
1 "589"	"237"
2 "626"	"248"
3 "598"	"237"
4 "579"	"319"
5 "618"	"247"
6 "619"	"321"
7 "666"	"237"
8 "605"	"248"
9 "677"	"237"
10 "592"	"248"

Started streaming 58 records after 43 ms and completed after 43 ms.

15. 任选三对Person，查找每一对Person的关系路径中长度小于10的那些路径，检索出这些路径上年龄大于22的Person集合，在这一查询中，由于数据量及Person的选取问题，可能导致该查询难以计算出结果，因此可以将10这一数字下调至可计算的程度（自行决定，但请保证 ≥ 2 ），或者更换Person对；

挑和第10道一样的三对：573, 400, 376, 666, 566, 434

从路径长度1~2开始，逐渐往上尝试

```
WITH ["573", "400"] AS pair1, ["376", "666"] AS pair2, ["566", "434"] AS pair3
UNWIND [pair1, pair2, pair3] AS pair
MATCH p = (p1:Person {id: pair[0]})-[*1..4]-(p2:Person {id: pair[1]})
WHERE ALL(n IN nodes(p) WHERE n.age > 22)
RETURN p1.id, p2.id, collect(nodes(p)) AS persons
```

结果：

1~4就要查很久都出不来了（后来我动了一下然后卡死了），我这里给个1~3

