BKMS Assignment 3

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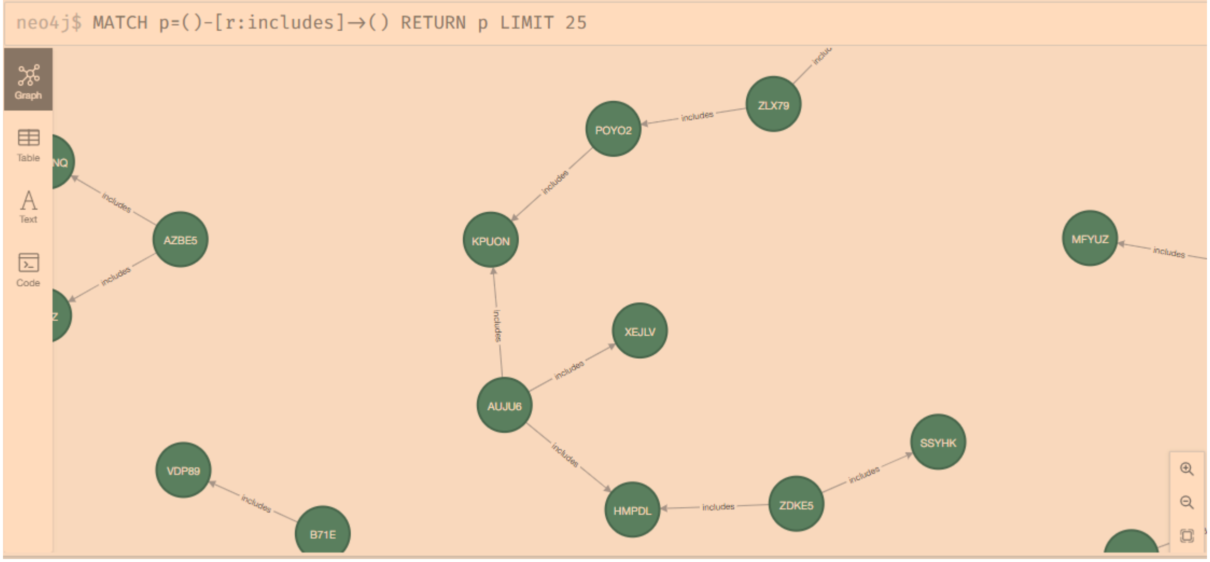
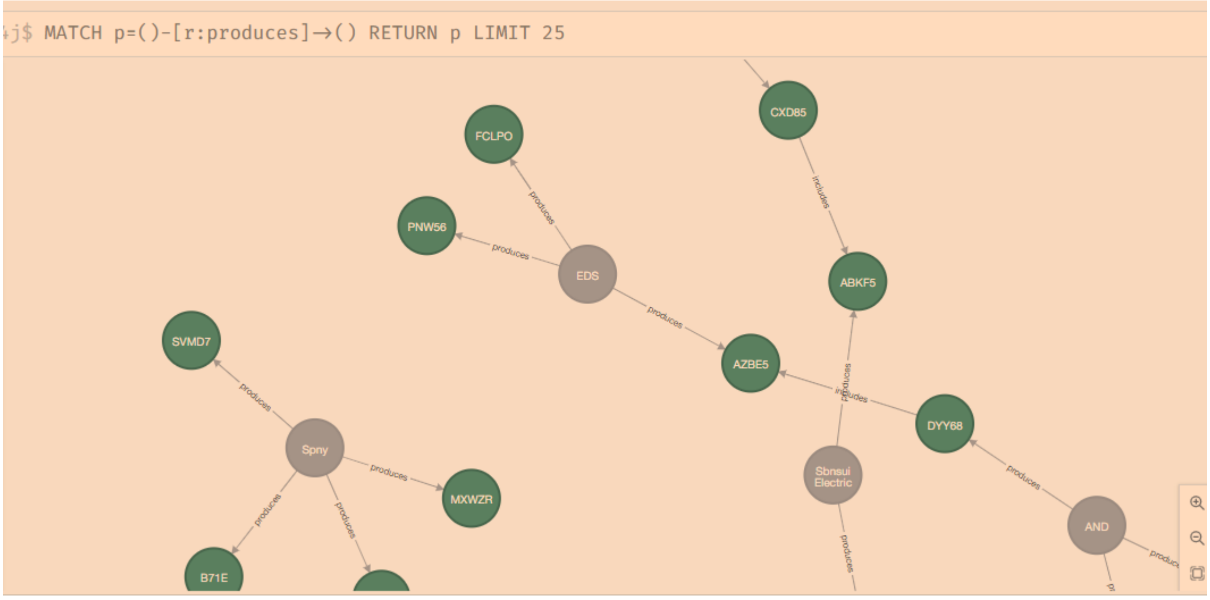
A. Import data to Neo4j from CSV files

```
#import products
LOAD CSV WITH HEADERS FROM "file:///Products.csv" AS row
CREATE (p:product {pid: toInteger(row.PID), product : row.Product, company: row.Company,
unit_price : toInteger(row.Unit_price)})
#import BOM with relationships
LOAD CSV with headers from "file:///BOM.csv" as row
MATCH (p:product),(p1:product)
WHERE p.pid = toInteger(row.Pid_sub) AND p1.pid = toInteger(row.Pid_parent)
MERGE (p1)-[r:includes {quantity: toInteger(row.Quantity)}]-(p)
#import company nodes
LOAD CSV WITH HEADERS FROM "file:///Products.csv" AS row
WITh  row.Company as company
unwind company as comp
with distinct comp
CREATE (c:company {company:comp});
#import produces relations
MATCH(p:product), (c:company)
WHERE p.company=c.company
MERGE (c)-[rel:produces]->(p)
return count(rel)
```



```
neo4j$ MATCH p=()-[r:includes]→() RETURN p LIMIT 25
```

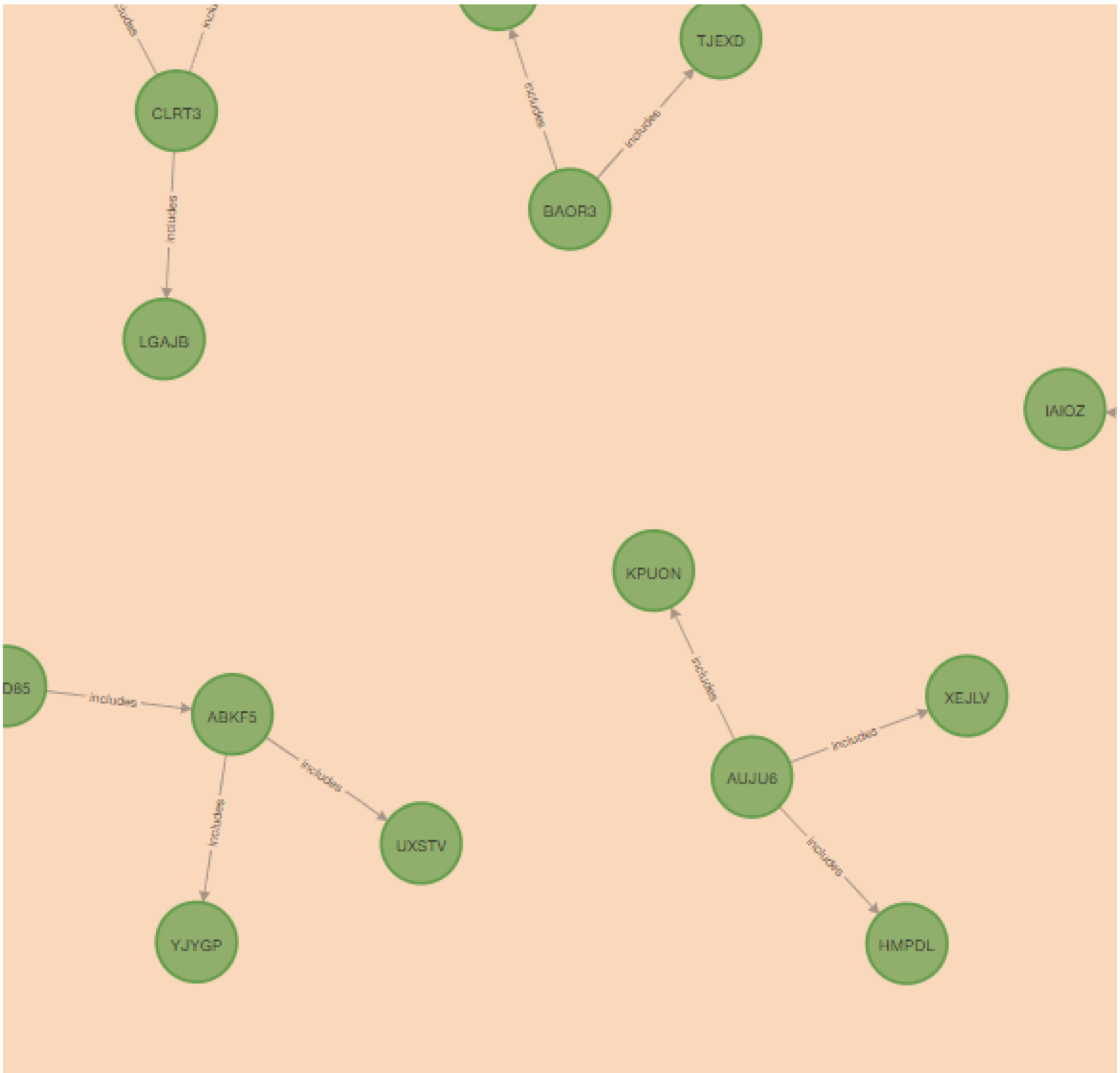


```
j$ MATCH p=()-[r:produces]→() RETURN p LIMIT 25
```

B. Import data to Neo4j from RDB tables

```
#1
CALL apoc.load.jdbc("jdbc:postgresql://localhost:5432/postgres?user=postgres&password=
***","boms")
YIELD row CREATE (:bom {pid_sub:row.pid_sub, pid_parent:row.pid_parent,quantity:row.qu
antity})
#2
CALL apoc.load.jdbc("jdbc:postgresql://localhost:5432/postgres?user=postgres&password=
***","boms") YIELD row
MATCH (p:products),(p1:products)
WHERE p.pid = toInteger(row.pid_sub) AND p1.pid = toInteger(row.pid_parent)
MERGE (p1)-[r:includes {quantity: toInteger(row.quantity)}]-(p)
--
MATCH p=()-[r:includes]->() RETURN p LIMIT 25
```

Query above satisfies the graph schema of the question as below



C. For each database created in A and B, you must perform the following three cypher queries:

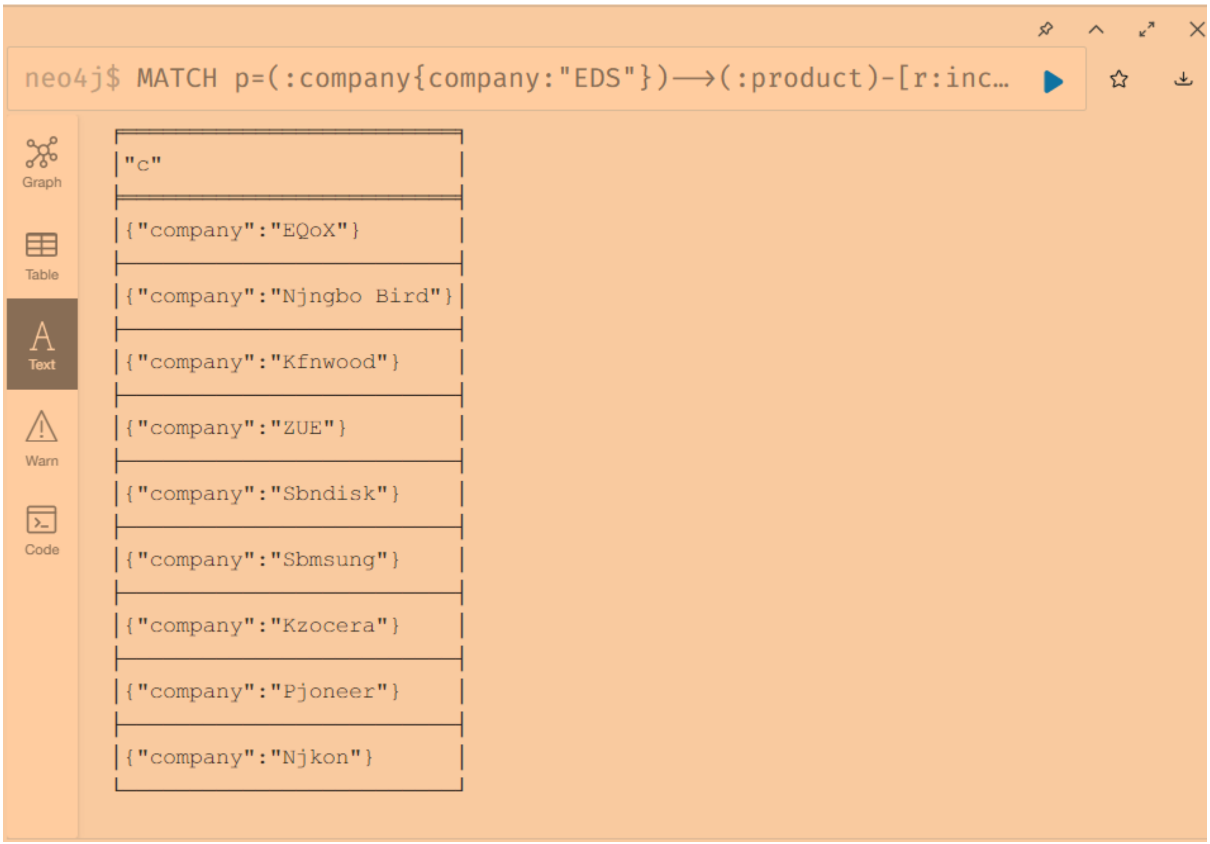
– Query 1: Find all companies that supplies sub-components to the company ‘EDS’

– Query 2: Find all leaf components and their quantities required to produce a product ‘KQX18’

– Query 3: Your own query that is difficult to perform in RDBMS due to the need for many joins

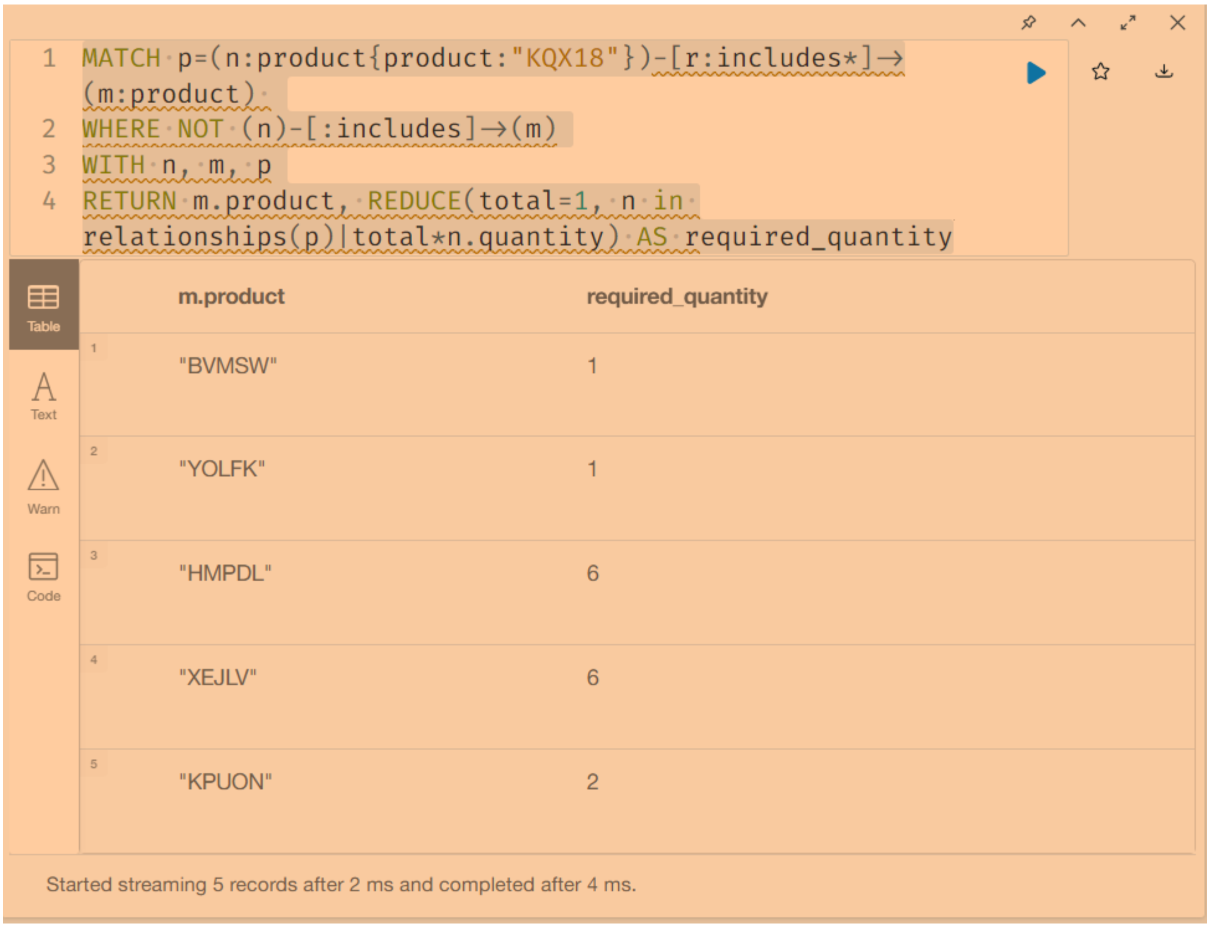
For DB obtained from problem A

```
Query 1.
MATCH p=(:company{company:"EDS"})-->(:product)-[r:includes*]->(psub:product)<--(c:comp
any)
Return c;
Query 2.
MATCH p=(n:product{product:"KQX18"})-[r:includes*]->(m:product)
WHERE NOT (n)-[:includes]->(m)
WITH n, m, p
RETURN m.product, REDUCE(total=1, n in relationships(p)|total*n.quantity) AS required_
quantity
Query 3. there's a big fire to the company of slyworth. which products will have diffi
culty manufacturing?
MATCH p=(b:product)-[r:includes]->(a:product) where a.company = "Slyworth"
Return p;
```



```
neo4j$ MATCH p=(:company{company:"EDS"})⟶(:product)-[r:inc…
```

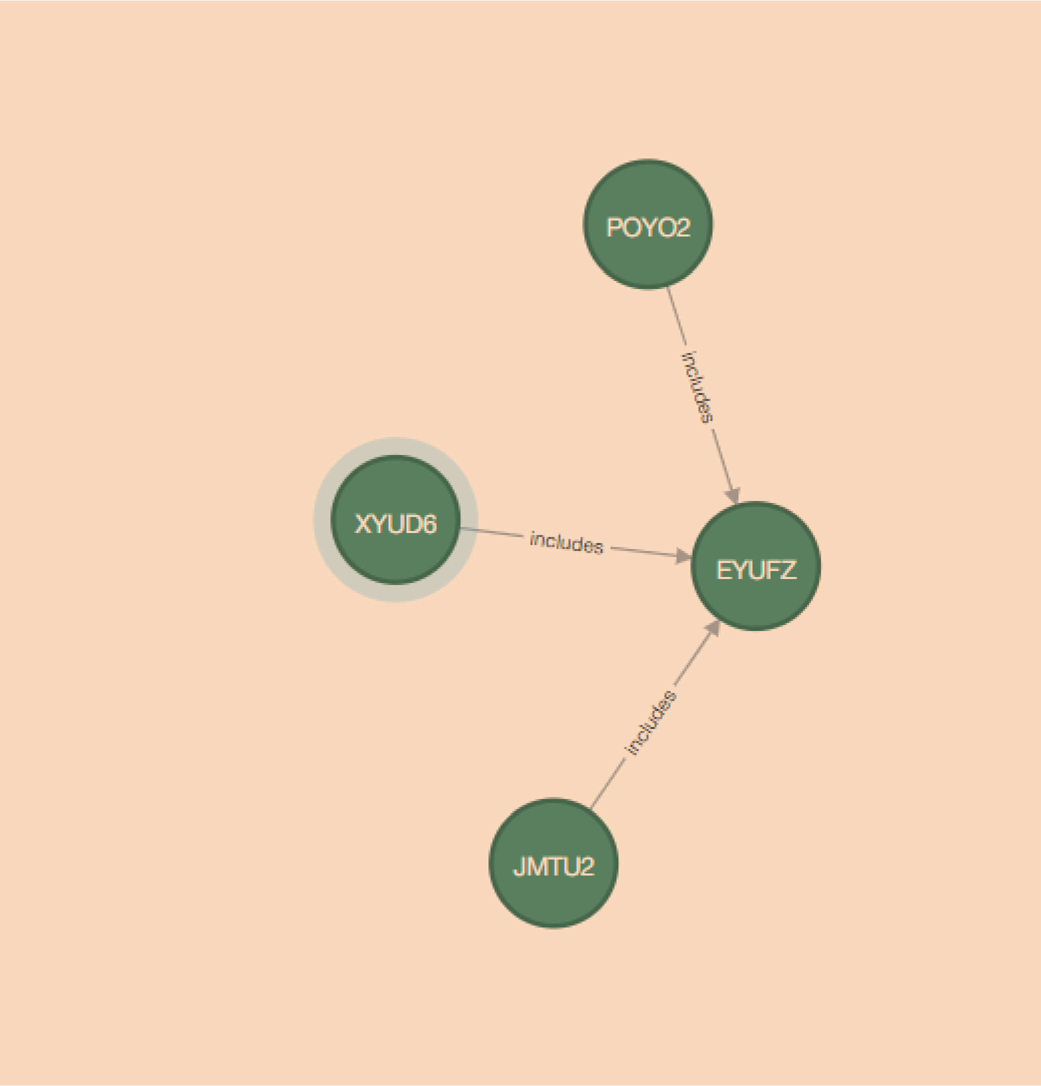
```
╒══════════════════════════╕
│"c"                       │
╞══════════════════════════╡
│{"company":"EQoX"}        │
├──────────────────────────┤
│{"company":"Njngbo Bird"} │
├──────────────────────────┤
│{"company":"Kfnwood"}     │
├──────────────────────────┤
│{"company":"ZUE"}         │
├──────────────────────────┤
│{"company":"Sbndisk"}     │
├──────────────────────────┤
│{"company":"Sbmsung"}     │
├──────────────────────────┤
│{"company":"Kzocera"}     │
├──────────────────────────┤
│{"company":"Pjoneer"}     │
├──────────────────────────┤
│{"company":"Njkon"}       │
└──────────────────────────┘
```



```
MATCH p=(n:product{product:"KQX18"})-[r:includes*]->(m:product)
WHERE NOT (n)-[:includes]->(m)
WITH n, m, p
RETURN m.product, REDUCE(total=1, n in relationships(p)|total*n.quantity) AS required_quantity
```

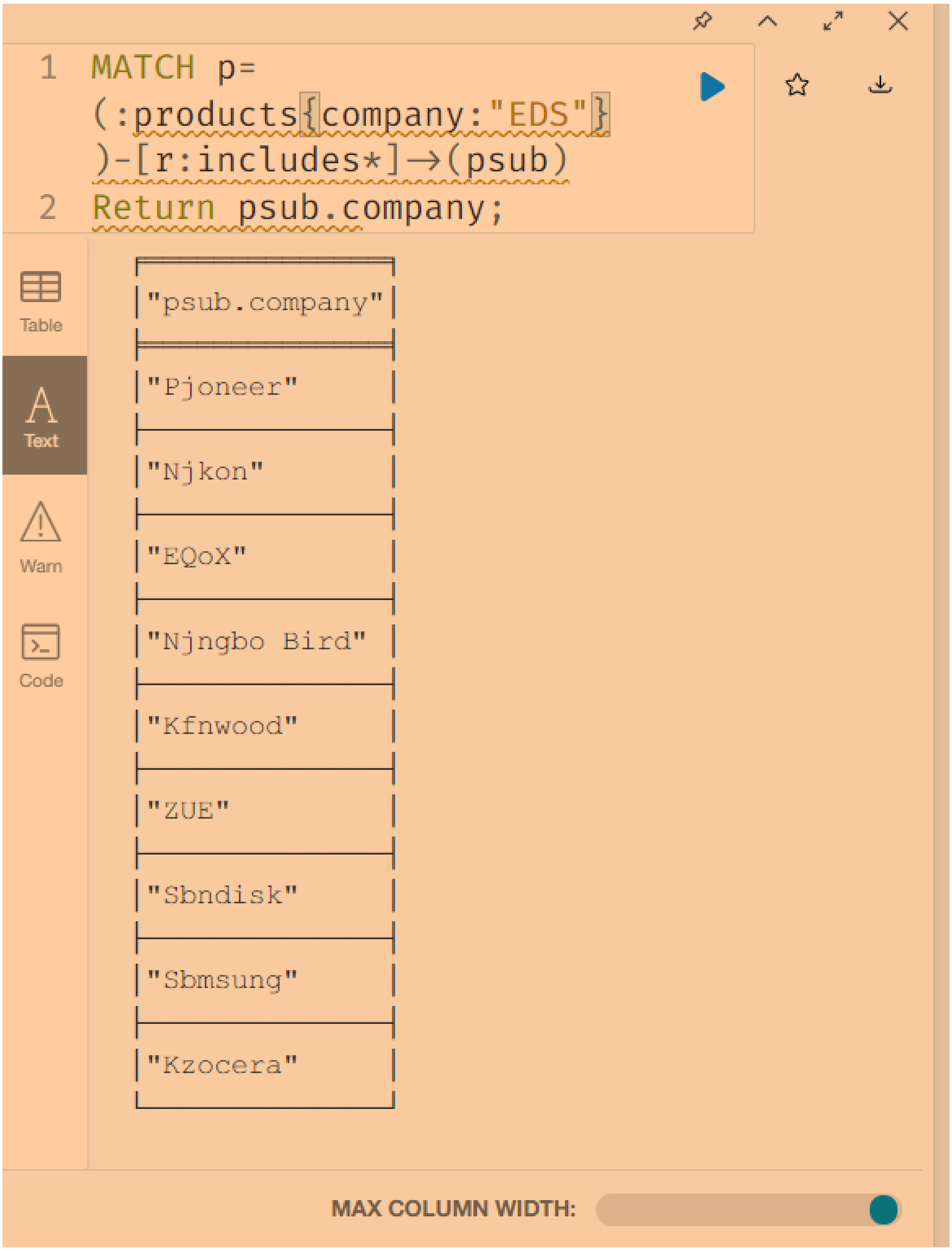
	m.product	required_quantity
1	"BVMSW"	1
2	"YOLFK"	1
3	"HMPDL"	6
4	"XEJLV"	6
5	"KPUON"	2

Started streaming 5 records after 2 ms and completed after 4 ms.



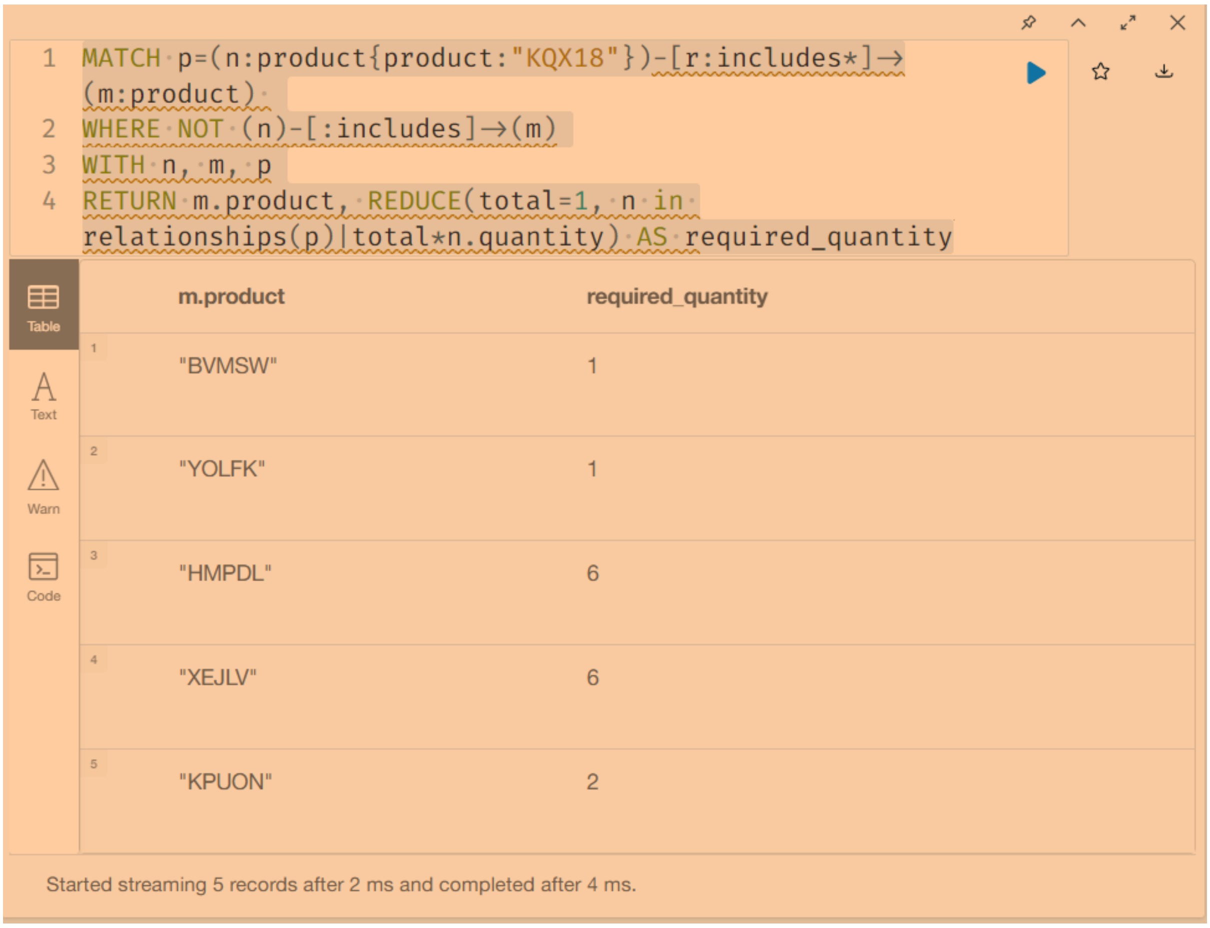
For DB B,

```
Query 1.
MATCH p=(:products{comapny:"EDS"})-[r:includes*]->(psub)
Return psub.comapny;
Query 2 and Query 3 are the same as DB A as there's no need to use the company node.
```



```
MATCH p=(:products{company:"EDS"})-[r:includes*]->(psub)
Return psub.company;
```

```
╒═══════════════╕
│"psub.company" │
╞═══════════════╡
│"Pjoneer"      │
├───────────────┤
│"Njkon"        │
├───────────────┤
│"EQoX"         │
├───────────────┤
│"Njngbo Bird"  │
├───────────────┤
│"Kfnwood"      │
├───────────────┤
│"ZUE"          │
├───────────────┤
│"Sbndisk"      │
├───────────────┤
│"Sbmsung"      │
├───────────────┤
│"Kzocera"      │
└───────────────┘
```



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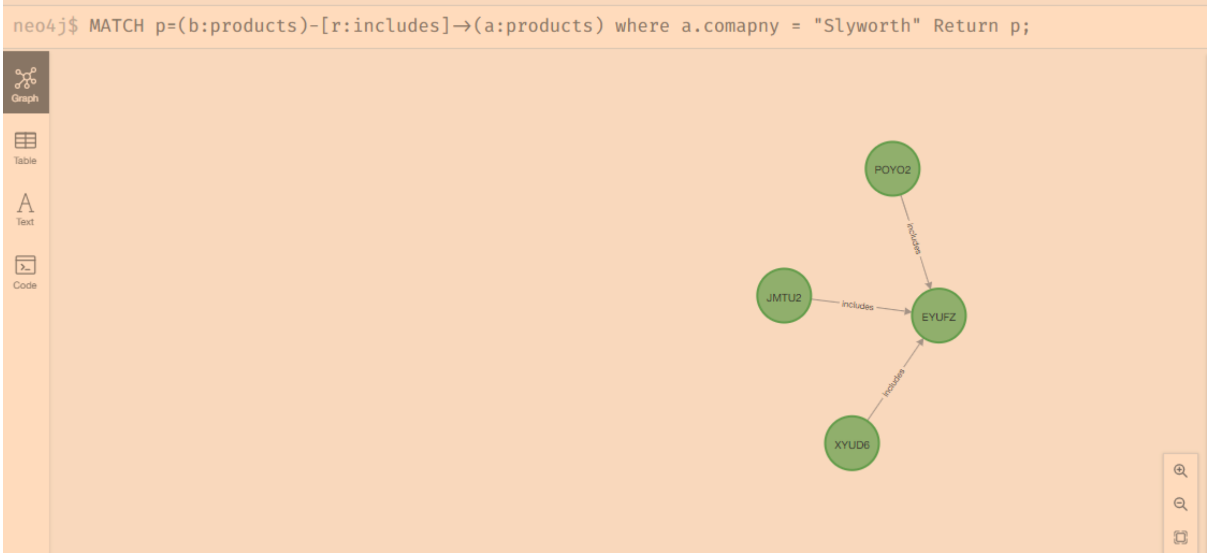

```
neo4j$ MATCH p=(b:products)-[r:includes]→(a:products) where a.comapny = "Slyworth" Return p;
```

D. The report must include an analysis of the following:

– Pros and cons of using Neo4j compared with RDBMS

Pros:

- Neo4j is good at processing highly connected or dynamic data such as networks. It enables agility of whole database.
- Data relationships can be easily found even in a huge database. (Deep search)

Cons

- RDBMS is great for tabular, structured data.
- Neo4J is inappropriate for understanding consistent table.
- Neo$j is not useful to find the data which is stored in key/value storage

Source: https://neo4j.com/blog/3-advantages-neo4j-alongside-oracle-rdbms/

Pros and cons of using Neo4j compared with Prolog

PROS

- Data is guaranteed to store in the graph while prolog conceptually stores graph.
- While prolog reasons through lots of data, neo4j describes a graph pattern the user wish to match.

CONS

- Neo4j cannot solve the problem based on general knowledge.
- Neo4j requires a lot of computing load while prolog does not.

Considerations for graph schema design

- Understand domain and users well
  - graph schema should be optimized for expected behavior of users. Schema should be designed for users to access information in need easily.
- Schema should mirror real graph.
  - The data and the relationships should be reflected in schema.

- Be specific with naming and datatypes.