Online Library Database Design

Part 2 – Neo4J

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Project information:

• This project is about implementing your work in part1 to generate the Neo4j Graph Data Model.

• You must convert the designed schema and all the simple and advanced queries. In addition to converting all the queries, updating and deleting commands to be used in Neo4j.

• Please use Neo4j and work in the group to complete this project worth 20% of the total course grade and will be evaluated through your written submission in the BB.

• You will find following link useful for exporting:

https://neo4j.com/docs/browser-manual/current/operations/export-results/

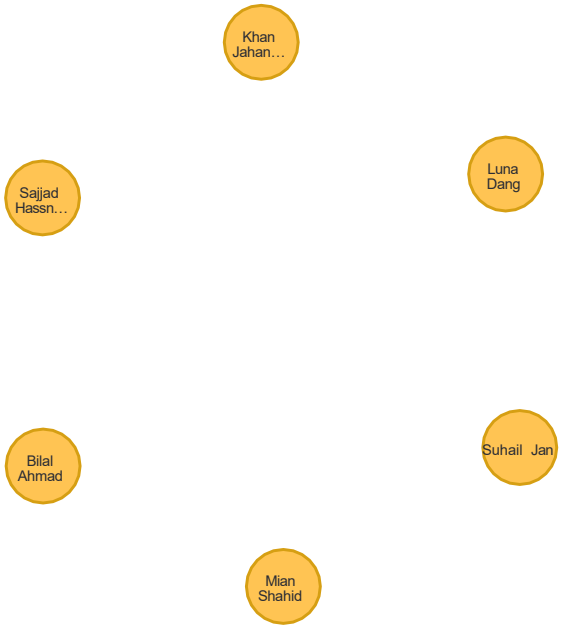
• This project required you to install the Neo4j Desktop application from the following link: https://neo4j.com/download/

I. Database construction

#Create Member Collection

```
CREATE(Mian:member{memberID: 'm01', name:"Mian Shahid", email:"mmashahid@protonmail.com", phone_number: 6475625993,
address:"3495 Morining Star Dr", city: "Mississauga", province: "Ontario", postal_code: "l4T 2E6"})
CREATE(Suhail:member{memberID: 'm02', name:"Suhail Jan", email:"jansuahail@protonmail.com", phone_number: 6475625554,
address:"3126 etude dr", city: "Mississauga", province: "Ontario", postal_code: "l4T 2E7"})
CREATE(Bilal:member{memberID: 'm03', name:"Bilal Ahmad", email:"bilal@protonmail.com", phone_number: 6475622134,
address:"2024 mosque cres", city: "Mississauga", province: "Ontario", postal_code: "MJ7 2E7"})
CREATE(Khan:member{memberID: 'm04', name:"Khan Jahanzaib", email:"jk@protonmail.com", phone_number: 6475622856,
address:"56 raxdale blvd", city: "Mississauga", province: "Ontario", postal_code: "MJ7 2K4"})
CREATE(Sajjad:member{memberID: 'm05', name:"Sajjad Hassnain", email:"hassnainsajjad@protonmail.com", phone_number: 6475622179,
address:"2022 derry road", city: "Mississauga", province: "Ontario", postal_code: "MJ7 2M9"})
CREATE(Luna:member{memberID: 'm06', name:"Luna Dang", email:"lunad@protonmail.com", phone_number: 3659986798,
address:"12 Carberry Cres", city: "Brampton", province: "Ontario", postal_code: "L6V 2E9"})
```

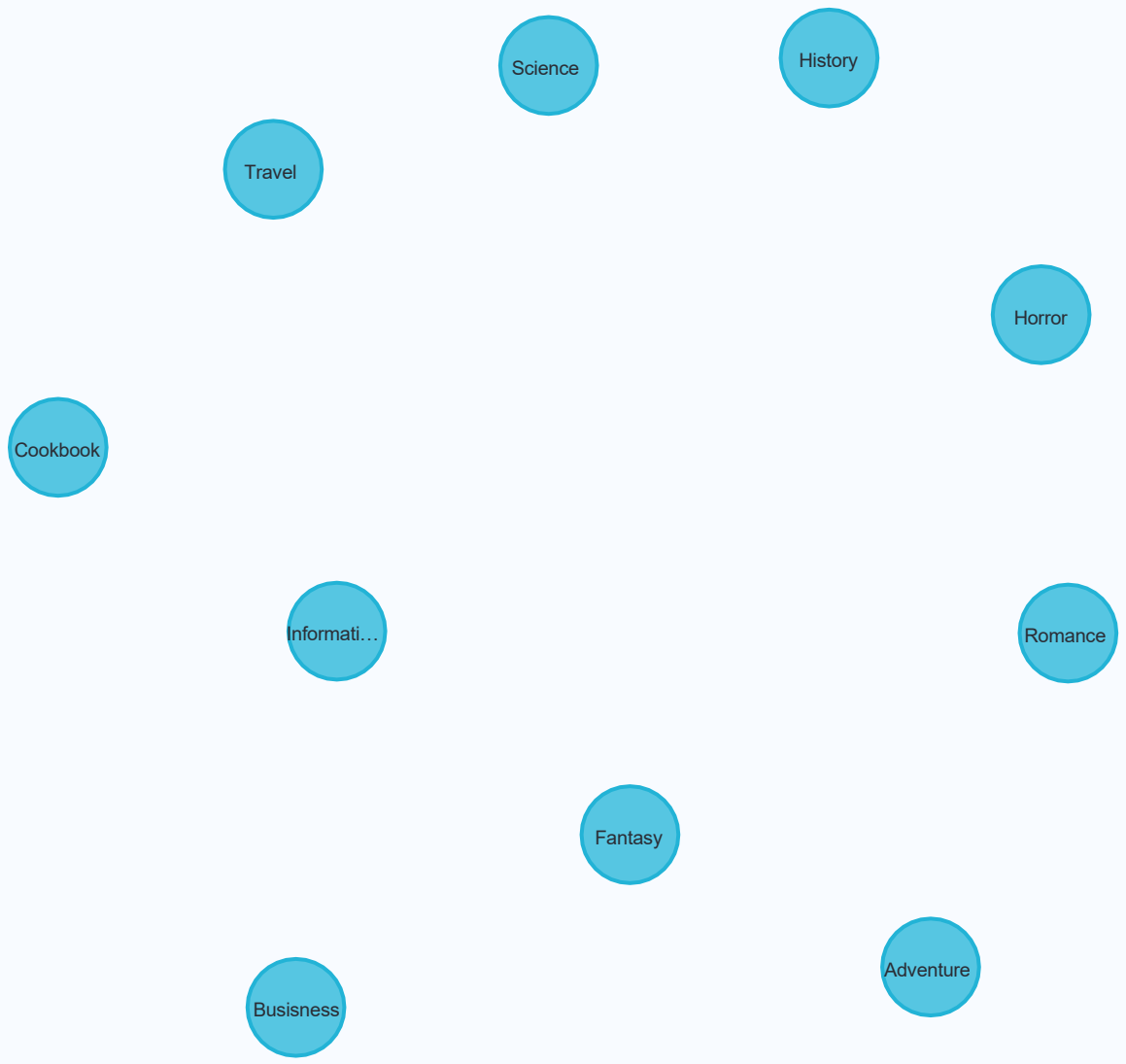
Added 6 labels, created 6 nodes, set 48 properties, completed after 34 ms.



#Create Category Collection

```
CREATE(Fantasy: category{categoryID: 'ca01', genres: 'Fantasy'})
CREATE(Adventure: category{categoryID: 'ca02', genres: 'Adventure'})
CREATE(Romance: category{categoryID: 'ca03', genres: 'Romance'})
CREATE(Horror: category{categoryID: 'ca04', genres: 'Horror'})
CREATE(History: category{categoryID: 'ca05', genres: 'History'})
CREATE(Science: category{categoryID: 'ca06', genres: 'Science'})
CREATE(Travel: category{categoryID: 'ca07', genres: 'Travel'})
CREATE(Cookbook: category{categoryID: 'ca08', genres: 'Cookbook'})
CREATE(InformationSystem: category{categoryID: 'ca09', genres: 'Information system'})
CREATE(Busisness: category{categoryID: 'ca10', genres: 'Busisness'})
```

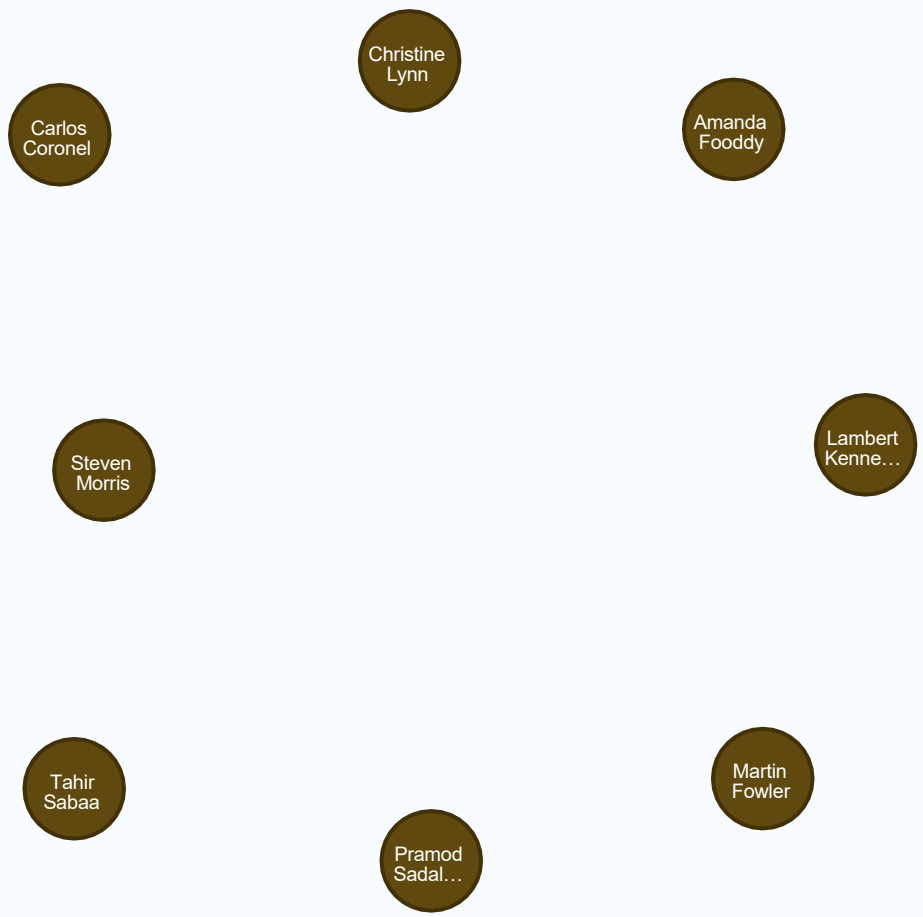
Added 10 labels, created 10 nodes, set 20 properties, completed after 14 ms.



#Create Author Collection

```
CREATE(Pramod: author{authorID: 'au01', name: 'Pramod Sadalage'})
CREATE(Fowler: author{authorID: 'au02', name: 'Martin Fowler'})
CREATE(Lambert: author{authorID: 'au03', name: 'Lambert Kenneth'})
CREATE(Fooddy: author{authorID: 'au04', name: 'Amanda Fooddy'})
CREATE(Lynn: author{authorID: 'au05', name: 'Christine Lynn'})
CREATE(Carlos: author{authorID: 'au06', name: 'Carlos Coronel'})
CREATE(Steven: author{authorID: 'au07', name: 'Steven Morris'})
CREATE(Tahir: author{authorID: 'au08', name: 'Tahir Sabaa'})
```

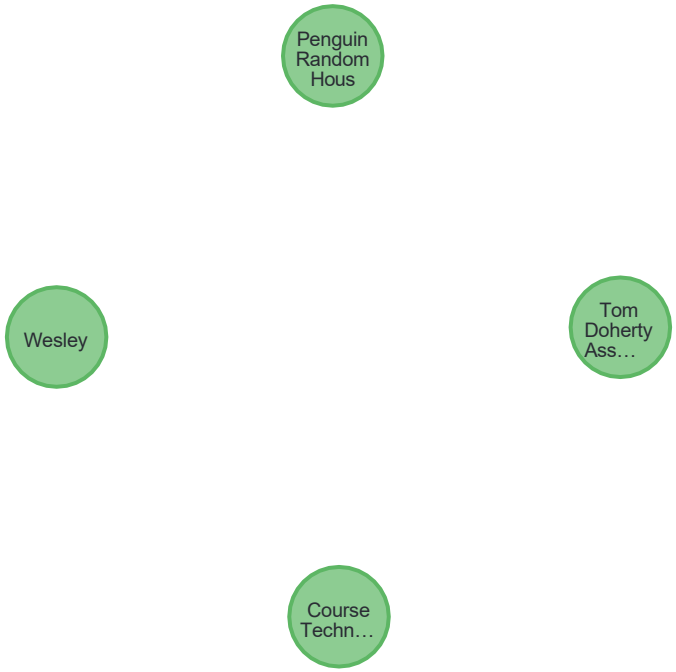
Added 8 labels, created 8 nodes, set 16 properties, completed after 20 ms.



#Create Publisher Collection

```
CREATE(CT:publisher{publisherid: 'pub01', publisher_name: 'Course Technology', publisher_location: 'Boston, USA'})
CREATE(TD:publisher{publisherid: 'pub02', publisher_name: 'Tom Doherty Association', publisher_location: 'Toronto, Canada'})
CREATE(PR:publisher{publisherid: 'pub03', publisher_name: 'Penguin Random House', publisher_location: 'London, UK'})
CREATE(Wesley:publisher{publisherid: 'pub04', publisher_name: 'Wesley', publisher_location: 'New York, USA'})
```

Added 4 labels, created 4 nodes, set 12 properties, completed after 21 ms.



#Create Book Collection

```
CREATE(AllofOurDemise: book{ISBN: 88001,
        title: "All of Our Demise",
        publisher_id: 'pub02',
        publication_date: 2022,
        edition: '1st',
        online_availability: false,
        instore_availability: true,
        quantity_in_stock: 3})
CREATE(DatabaseSystem: book{
        ISBN: 77001,
        title: "Database Systems",
```

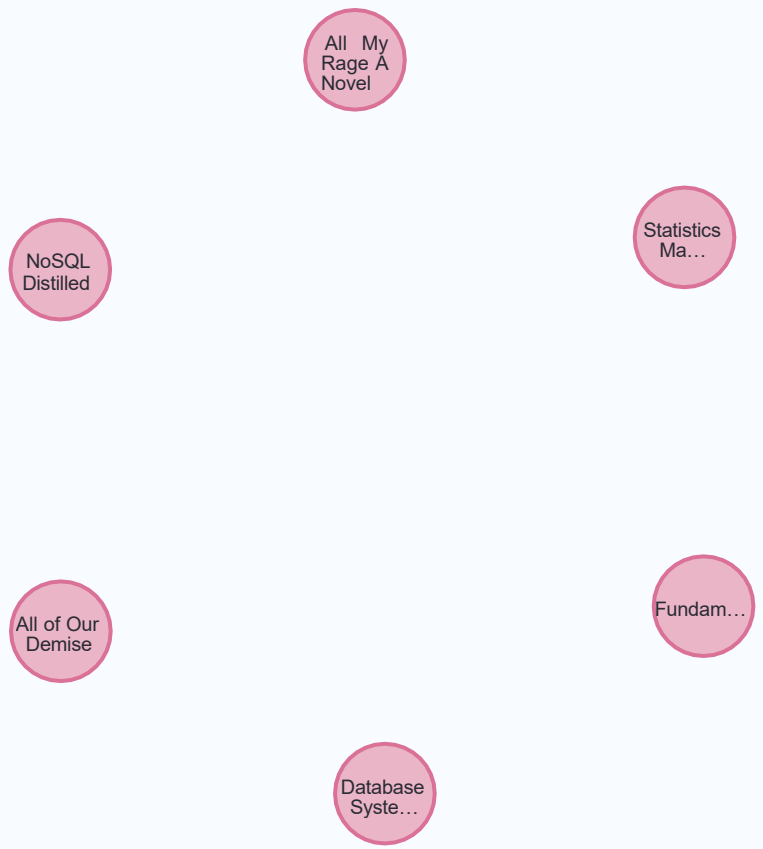
```
        publisher_id: 'pub01',
        publication_date: 2009,
        edition: '9th',
        online_availability: True,
        instore_availability: True,
        quantity_in_stock: 5})
CREATE(FundamentalsOfPython: book{
        ISBN: 77002,
        title: "Fundamentals of Python",
        publisher_id: 'pub01',
        publication_date: 2010,
        edition: '5th',
        online_availability: true,
        instore_availability: true,
        quantity_in_stock: 6})

CREATE(StatisticsForManagementAndEconomics: book{
        ISBN: 77003,
        title: "Statistics for Management and Economics",
        publisher_id: 'pub01',
        publication_date: 2018,
        edition: '11th',
        online_availability: true,
        instore_availability: false,
        quantity_in_stock: 0
        })

CREATE(AllMyRageANovel: book{ISBN: 88002,
        title: "All My Rage A Novel",
        publisher_id: 'pub03',
        publication_date: 2022,
        edition: '1st',
        online_availability: false,
        instore_availability: true,
        quantity_in_stock: 4})

CREATE(NoSQLDistilled: book{ISBN: 77004,
        title: "NoSQL Distilled",
        publisher_id: 'pub04',
        publication_date: 2013,
        edition: '3rd',
        online_availability: true,
        instore_availability: true,
        quantity_in_stock: 6})
```

Added 6 labels, created 6 nodes, set 48 properties, completed after 32 ms.



#Create book-author relationships

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 88001
AND a.authorID = 'au04'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Amanda Fooddy","authorID":"au04"}	{"publisher_id":"pub02","instore_availability":true,"online_availability":false,"ISBN":88001,"publication_date":2022,"edition":"1st","title":"All of Our Demise","quantity_in_stock":3}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 88001
AND a.authorID = 'au05'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Christine Lynn","authorID":"au05"}	{"publisher_id":"pub02","instore_availability":true,"online_availability":false,"ISBN":88001,"publication_date":2022,"edition":"1st","title":"All of Our Demise","quantity_in_stock":3}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 88002
AND a.authorID = 'au08'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Tahir Sabaa","authorID":"au08"}	{"publisher_id":"pub03","instore_availability":true,"online_availability":false,"ISBN":88002,"publication_date":2022,"edition":"1st","title":"All My Rage A Novel","quantity_in_stock":4}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 77001
AND a.authorID = 'au02'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Martin Fowler","authorID":"au02"}	{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77001,"publication_date":2009,"edition":"9th","title":"Database Systems","quantity_in_stock":5}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 77001
AND a.authorID = 'au06'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Carlos Coronel","authorID":"au06"}	{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77001,"publication_date":2009,"edition":"9th","title":"Database Systems","quantity_in_stock":5}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 77001
AND a.authorID = 'au07'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Steven Morris","authorID":"au07"}	{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77001,"publication_date":2009,"edition":"9th","title":"Database Systems","quantity_in_stock":5}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 77002
AND a.authorID = 'au03'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

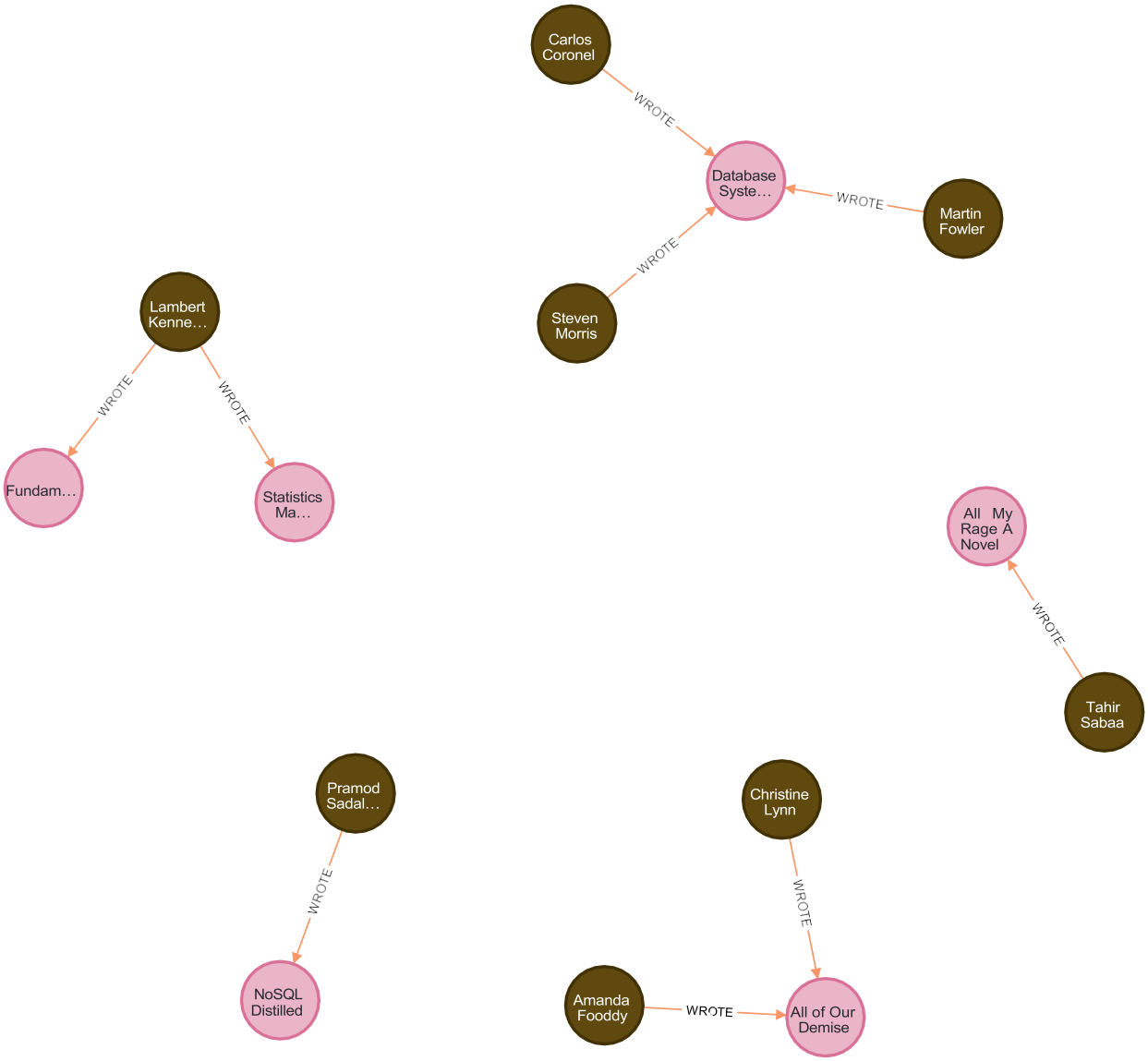
"a"	"b"
{"name":"Lambert Kenneth","authorID":"au03"}	{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77002,"publication_date":2010,"edition":"5th","title":"Fundamentals of Python","quantity_in_stock":6}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 77003
AND a.authorID = 'au03'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Lambert Kenneth","authorID":"au03"}	{"publisher_id":"pub01","instore_availability":false,"online_availability":true,"ISBN":77003,"publication_date":2018,"edition":"11th","title":"Statistics for Management and Economics","quantity_in_stock":0}

```
MATCH (a:author),(b:book)
WHERE b.ISBN = 77004
AND a.authorID = 'au01'
CREATE (a)-[:WROTE]->(b)
RETURN a,b
```

"a"	"b"
{"name":"Pramod Sadalage","authorID":"au01"}	{"publisher_id":"pub04","instore_availability":true,"online_availability":true,"ISBN":77004,"publication_date":2013,"edition":"3rd","title":"NoSQL Distilled","quantity_in_stock":6}


Carlos Coronel
WROTE
Database Syste…
WROTE
Martin Fowler
WROTE
Steven Morris
Lambert Kenne…
WROTE
WROTE
Fundam…
Statistics Ma…
All My Rage A Novel
WROTE
Tahir Sabaa
Pramod Sadal…
WROTE
NoSQL Distilled
Christine Lynn
WROTE
Amanda Fooddy
WROTE
All of Our Demise

#Create Book-Category relationships

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 88001
AND c.categoryID = 'ca01'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub02","instore_availability":true,"online_availability":false,"ISBN":88001,"publication_date":2022,"edition":"1st","title":"All of Our Demise","quantity_in_stock":3}	{"genres":"Fantasy","categoryID":"ca01"}

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 88001
AND c.categoryID = 'ca04'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub02","instore_availability":true,"online_availability":false,"ISBN":88001,"publication_date":2022,"edition":"1st","title":"All of Our Demise","quantity_in_stock":3}	{"genres":"Horror","categoryID":"ca04"}

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 88002
AND c.categoryID = 'ca02'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub03","instore_availability":true,"online_availability":false,"ISBN":88002,"publication_date":2022,"edition":"1st","title":"All My Rage A Novel","quantity_in_stock":4}	{"genres":"Adventure","categoryID":"ca02"}

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 77001
AND c.categoryID = 'ca09'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77001,"publication_date":2009,"edition":"9th","title":"Database Systems","quantity_in_stock":5}	{"genres":"Information system","categoryID":"ca09"}

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 77002
AND c.categoryID = 'ca06'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77002,"publication_date":2010,"edition":"5th","title":"Fundamentals of Python","quantity_in_stock":6}	{"genres":"Science","categoryID":"ca06"}

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 77002
AND c.categoryID = 'ca09'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77002,"publication_date":2010,"edition":"5th","title":"Fundamentals of Python","quantity_in_stock":6}	{"genres":"Information system","categoryID":"ca09"}

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 77003
AND c.categoryID = 'ca09'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub01","instore_availability":false,"online_availability":true,"ISBN":77003,"publication_date":2018,"edition":"11th","title":"Statistics for Management and Economics","quantity_in_stock":0}	{"genres":"Information system","categoryID":"ca09"}

```
MATCH (b:book),(c:category)
WHERE b.ISBN = 77003
AND c.categoryID = 'ca10'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub01","instore_availability":false,"online_availability":true,"ISBN":77003,"publication_date":2018,"edition":"11th","title":"Statistics for Management and Economics","quantity_in_stock":0}	{"genres":"Business","categoryID":"ca10"}

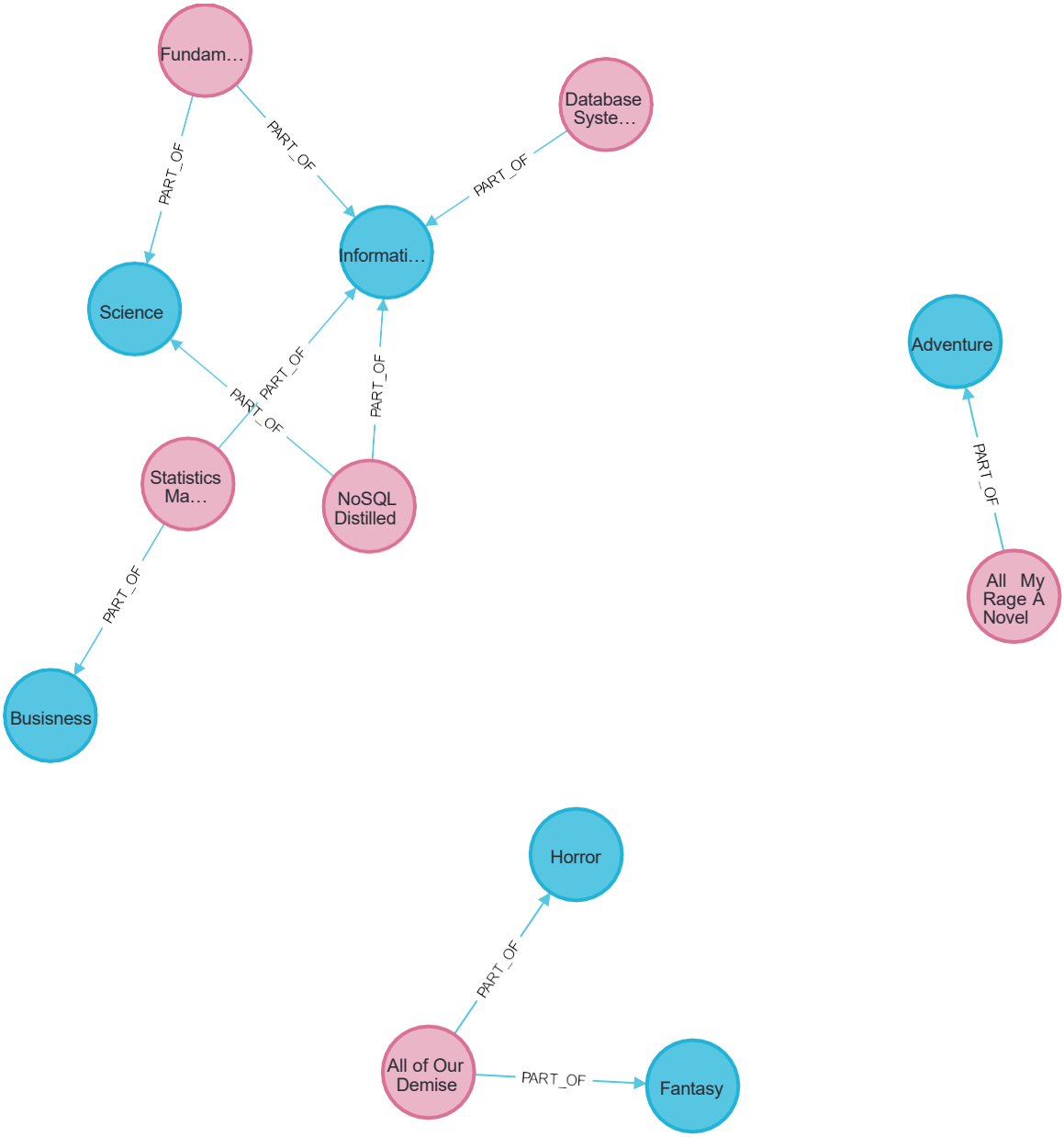
```
MATCH (b:book),(c:category)
```

```
WHERE b.ISBN = 77004
AND c.categoryID = 'ca09'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub04","instore_availability":true,"online_availability":true,"ISBN":77004,"publication_date":2013,"edition":"3rd","title":"NoSQL Distilled","quantity_in_stock":6}	{"genres":"Information system","categoryID":"ca09"}

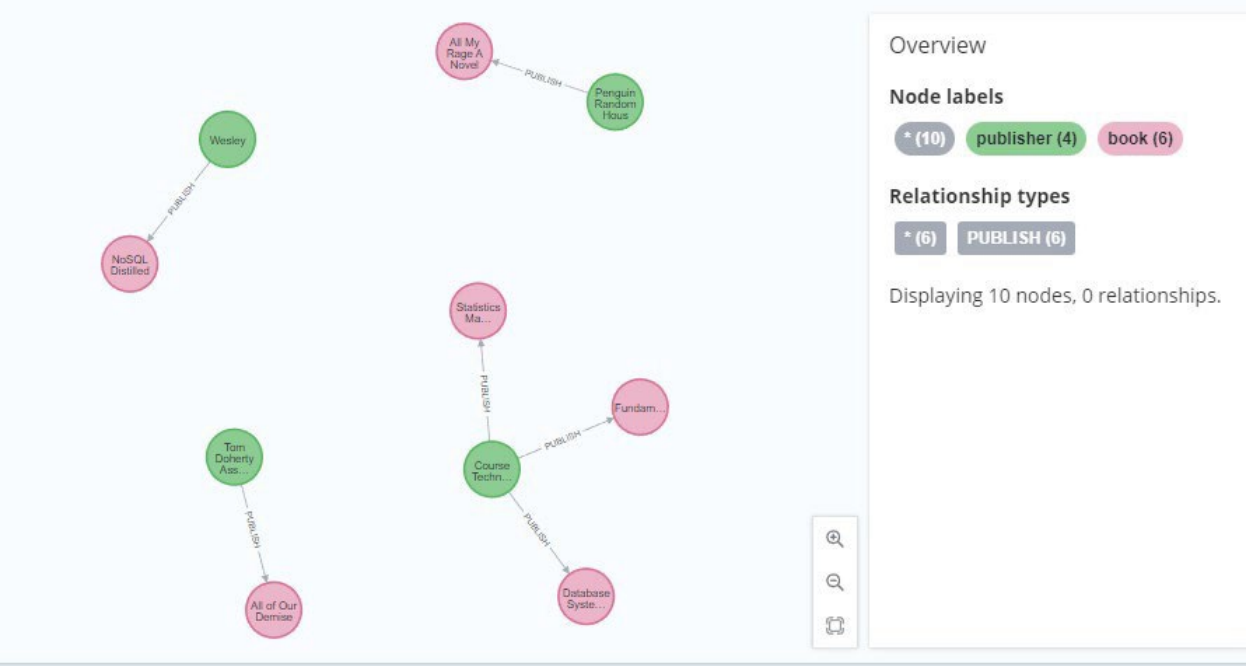
```
MATCH (b:book),(c:category)
WHERE b.ISBN = 77004
AND c.categoryID = 'ca06'
CREATE (b)-[:PART_OF]->(c)
RETURN b,c
```

"b"	"c"
{"publisher_id":"pub04","instore_availability":true,"online_availability":true,"ISBN":77004,"publication_date":2013,"edition":"3rd","title":"NoSQL Distilled","quantity_in_stock":6}	{"genres":"Science","categoryID":"ca06"}


Fundam…
Database Syste…
Informati…
Science
Adventure
Statistics Ma…
NoSQL Distilled
All My Rage A Novel
Busisness
Horror
All of Our Demise
Fantasy
PART_OF

#Create Book-Publisher relationships

```
MATCH (p:publisher), (b:book)
WHERE p.publisherid = b.publisher_id
CREATE (p)-[:PUBLISH]->(b)
RETURN p,b
```



#Create book-member Borrowing relationships

```
MATCH (m:member), (b:book)
WHERE m.memberID = 'm01'
AND b.ISBN = 77001
CREATE (m)-[r:borrow {date_borrow: date("2022-10-12"),
            due_date: date("2022-10-22"),
            return_date: date("2022-10-19"),
            fine_amount: 0.00,
            payment_status: 'n/a',
            Payment_date: 'n/a'}]->(b)
RETURN m,b
```

"m"	"b"
{"address":"3495 Morining Star Dr","province":"Ontario","city":"Mississauga","name":"Mian Shahid","phone_number":6475625993,"postal_code":"L4T 2E6","email":"mmashahid@protonmail.com","memberID":"m01"}	{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77001,"publication_date":2009,"edition":"9th","title":"Database Systems","quantity_in_stock":5}

```
MATCH (m:member), (b:book)
WHERE m.memberID = 'm02'
AND b.ISBN = 88001
CREATE (m)-[r:borrow {date_borrow: date("2022-10-12"),
            due_date: date("2022-11-1"),
            return_date: 'n/a',
            fine_amount: 1.00,
            payment_status: 'unpaid',
            Payment_date: 'n/a'}]->(b)
RETURN m,b
```

"m"	"b"
{"address":"3126 etude dr","province":"Ontario","city":"Mississauga","name":"Suhail Jan","phone_number":6475625554,"postal_code":"14T 2E7","email":"jansuahail@protonmail.com","memberID":"m02"}	{"publisher_id":"pub02","instore_availability":true,"online_availability":false,"ISBN":88001,"publication_date":2022,"edition":"1st","title":"All of Our Demise","quantity_in_stock":3}

```
MATCH (m:member), (b:book)
WHERE m.memberID = 'm03'
AND b.ISBN = 88002
CREATE (m)-[r:borrow {date_borrow: date("2022-9-10"),
            due_date: date("2022-9-30"),
            return_date: date("2022-10-15"),
            fine_amount: 2.00,
            payment_status: 'paid',
            Payment_date: date("2022-10-15")}]->(b)
RETURN m,b
```

"m"	"b"
{"address":"2024 mosque cres","province":"Ontario","city":"Mississauga","name":"Bilal Ahmad","phone_number":6475622134,"postal_code":"MJ7 2E7","email":"bilal@protonmail.com","memberID":"m03"}	{"publisher_id":"pub03","instore_availability":true,"online_availability":false,"ISBN":88002,"publication_date":2022,"edition":"1st","title":"All My Rage A Novel","quantity_in_stock":4}

```
MATCH (m:member), (b:book)
WHERE m.memberID = 'm03'
AND b.ISBN = 77004
CREATE (m)-[r:borrow {date_borrow: date("2022-9-10"),
            due_date: date("2022-9-30"),
            return_date: date("2022-10-15"),
            fine_amount: 2.00,
            payment_status: 'paid',
            Payment_date: date("2022-10-15")}]->(b)
RETURN m,b
```

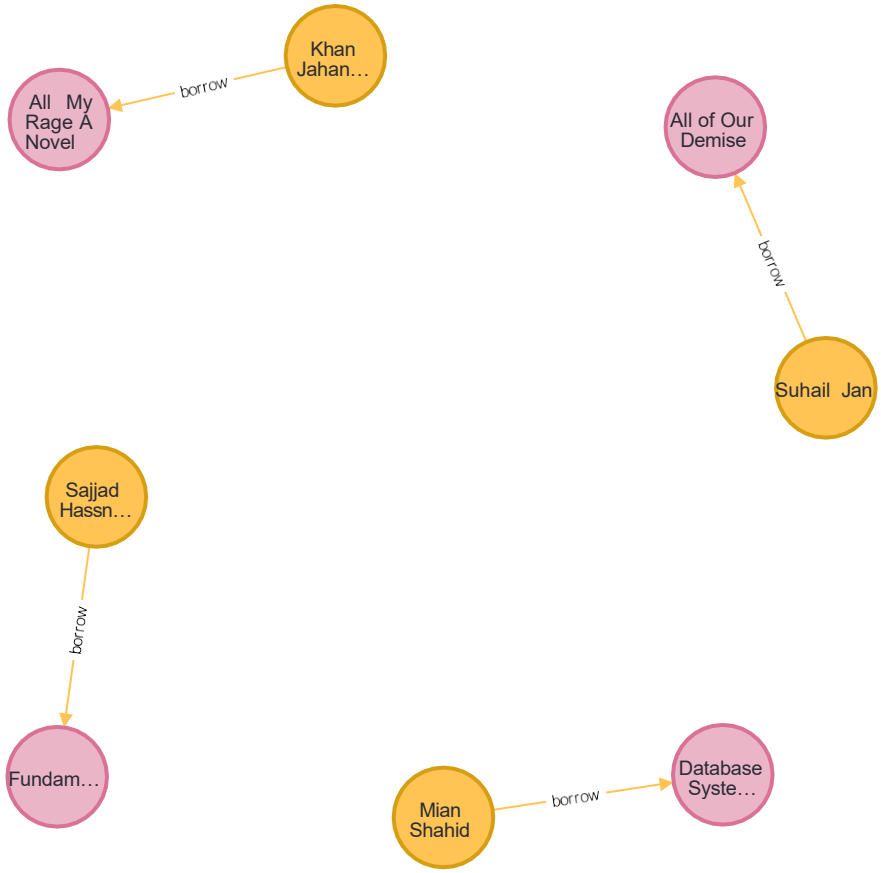
"m"	"b"
{"address":"2024 mosque cres","province":"Ontario","city":"Mississauga","name":"Bilal Ahmad","phone_number":6475622134,"postal_code":"MJ7 2E7","email":"bilal@protonmail.com","memberID":"m03"}	{"publisher_id":"pub04","instore_availability":true,"online_availability":true,"ISBN":77004,"publication_date":2013,"edition":"3rd","title":"NoSQL Distilled","quantity_in_stock":6}

```
MATCH (m:member), (b:book)
WHERE m.memberID = 'm04'
AND b.ISBN = 88002
CREATE (m)-[r:borrow {date_borrow: date("2022-10-10"),
            due_date: date("2022-10-31"),
            return_date: 'n/a',
            fine_amount: 3.00,
            payment_status: 'unpaid',
            Payment_date: 'n/a'}]->(b)
RETURN m,b
```

"m"	"b"
{"address":"56 raxdale blvd","province":"Ontario","city":"Mississauga","name":"Khan Jahanzaib","phone_number":6475622856,"postal_code":"MJ7 2K4","email":"jk@protonmail.com","memberID":"m04"}	{"publisher_id":"pub03","instore_availability":true,"online_availability":false,"ISBN":88002,"publication_date":2022,"edition":"1st","title":"All My Rage A Novel","quantity_in_stock":4}

```
MATCH (m:member), (b:book)
WHERE m.memberID = 'm05'
AND b.ISBN = 77002
CREATE (m)-[r:borrow {date_borrow: date("2022-10-29"),
            due_date: date("2022-11-12"),
            return_date: 'n/a',
            fine_amount: 0.00,
            payment_status: 'n/a',
            Payment_date: 'n/a'}]->(b)
RETURN m,b
```

"m"	"b"
{"address":"2022 derry road","province":"Ontario","city":"Mississauga","name":"Sajjad Hassnain","phone_number":6475622179,"postal_code":"MJ7 2M9","email":"hassnainsajjad@protonmail.com","memberID":"m05"}	{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77002,"publication_date":2010,"edition":"5th","title":"Fundamentals of Python","quantity_in_stock":6}

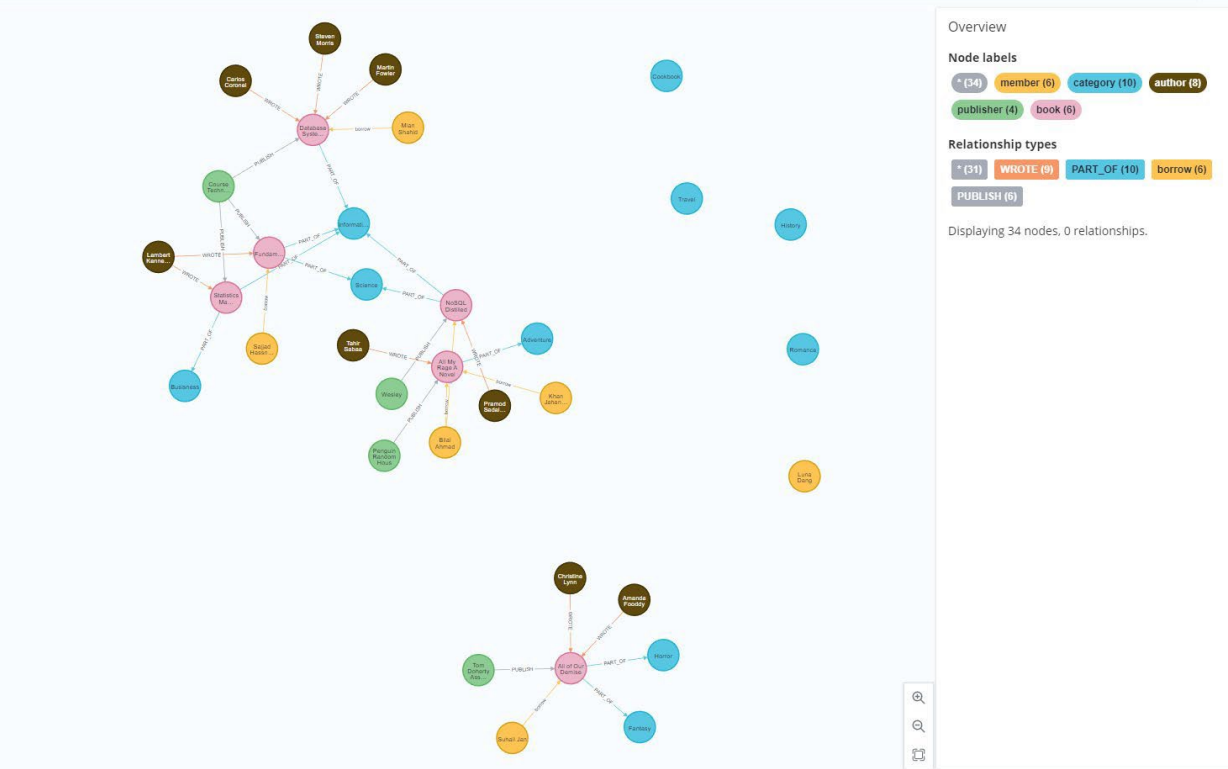

Khan Jahan…
borrow
All My Rage A Novel
All of Our Demise
borrow
Suhail Jan
Sajjad Hassn…
borrow
Fundam…
Mian Shahid
borrow
Database Syste…

II. Designing Simple Quarries:

Prepare at least 8 simple queries (at least one for each of your collection) and show the snapshots of their results. In general, you have to produce professional report results for queries. The query results should show records in collections with meaningful titles and proper format.

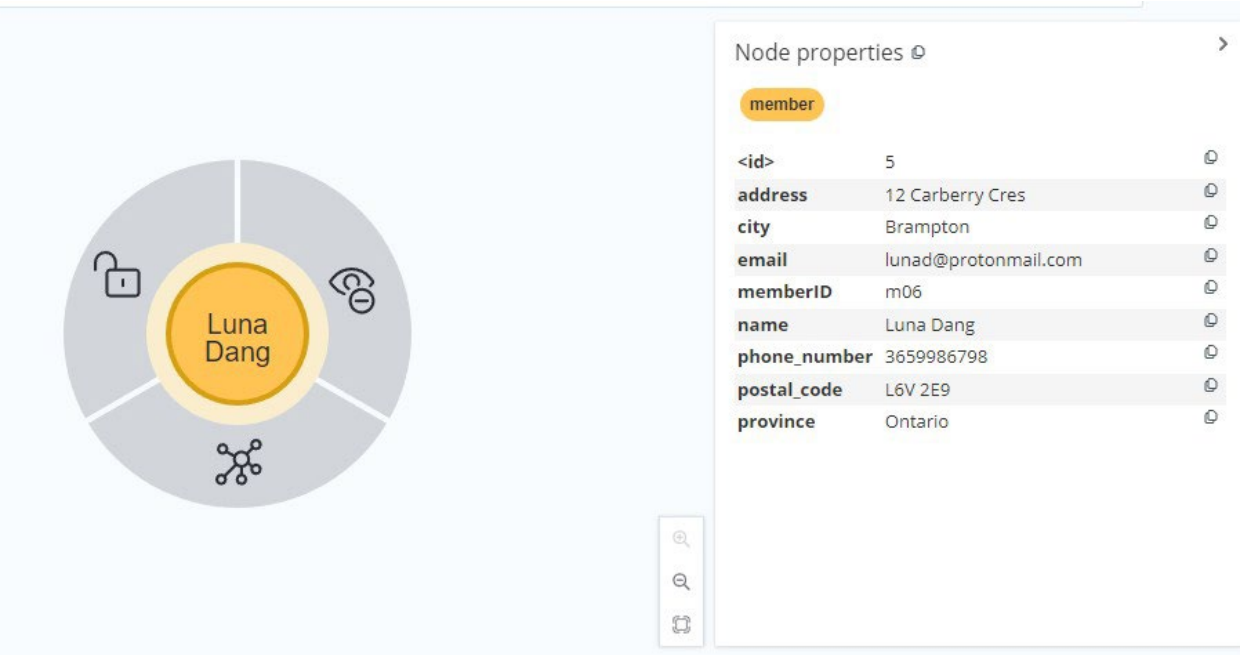
(1) Show all the collections:

MATCH (n) RETURN n



(2) Retrieve all information on the users that live in ‘Brampton’

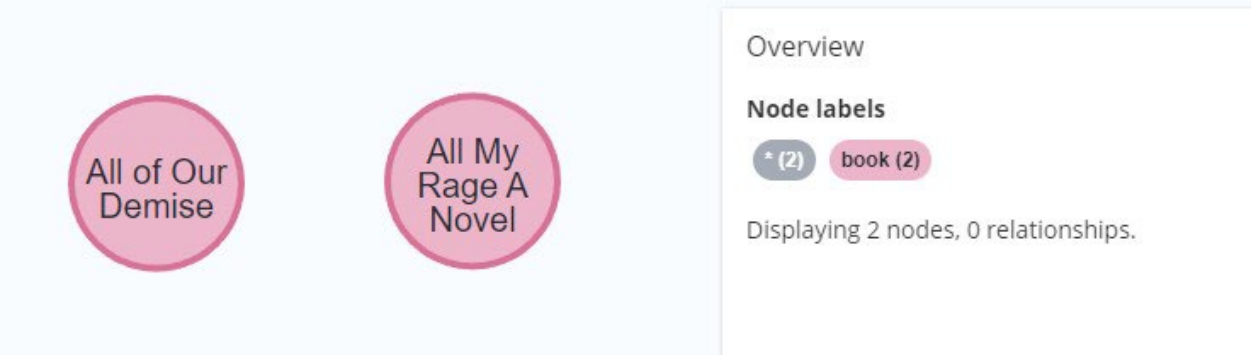
```
MATCH (n:member)
WHERE n.city = 'Brampton'
RETURN n
```



(3) Retrieve all information on all of the books published after 2018

```
MATCH (n:book)
WHERE n.publication_date > 2018
RETURN n
```

"n"
{"publisher_id":"pub03","instore_availability":true,"online_availability":false,"ISBN":88002,"publication_date":2022,"edition":"1st","title":"All My Rage A Novel","quantity_in_stock":4}
{"publisher_id":"pub02","instore_availability":true,"online_availability":false,"ISBN":88001,"publication_date":2022,"edition":"1st","title":"All of Our Demise","quantity_in_stock":3}



(4) Find all members who borrow the book "All My Rage A Novel", show their memberID, and name.

```
MATCH (m:member)<-[:borrow]->(b:book)
WHERE b.title = 'All My Rage A Novel'
RETURN m.name as MemberName, m.memberID as MemberID
```

"MemberName"	"MemberID"
"Khan Jahanzaib"	"m04"
"Bilal Ahmad"	"m03"

(5) Show Authors' name, but do not show _id:

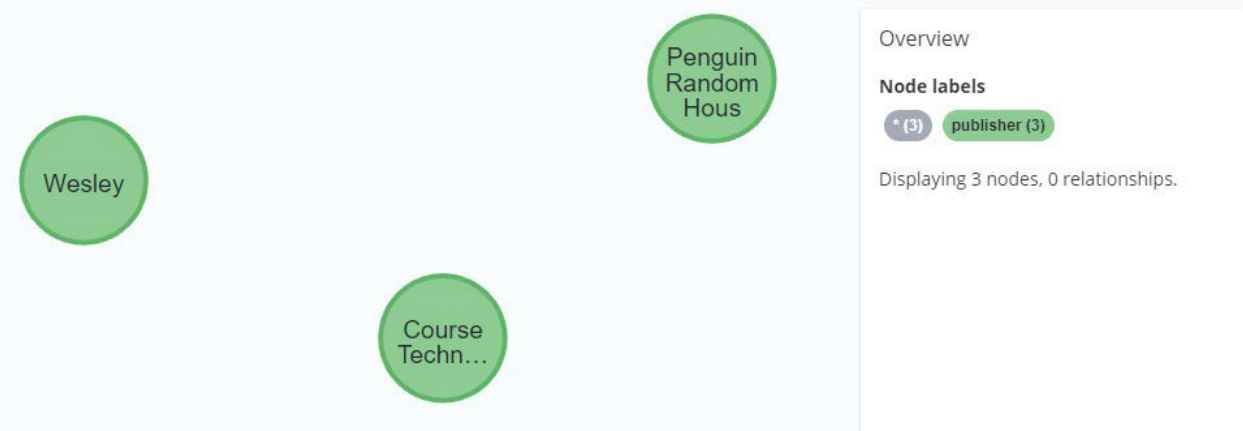
```
MATCH (a:author)
RETURN a.name as AuthorName
```

"AuthorName"
"Pramod Sadalage"
"Martin Fowler"
"Lambert Kenneth"
"Amanda Fooddy"
"Christine Lynn"
"Carlos Coronel"
"Steven Morris"
"Tahir Sabaa"

(6) Retrieve all information on the publishers that are not in 'Toronto, Canada'

```
MATCH (n:publisher)
WHERE n.publisher_location <> "Toronto, Canada"
RETURN n
```

"n"
{"publisherid":"pub01","publisher_name":"Course Technology","publisher_location":"Boston, USA"}
{"publisherid":"pub03","publisher_name":"Penguin Random House","publisher_location":"London, UK"}
{"publisherid":"pub04","publisher_name":"Wesley","publisher_location":"New York, USA"}



(7) Count the number of books written by the author with authorID as 'au03'

```
MATCH (a:author)<-[:WROTE]->(b:book)
WHERE a.authorID = 'au03'
RETURN a.name, COUNT(b) as NumberOfBookByLambert
```

"a.name"	"NumberOfBookByLambert"
"Lambert Kenneth"	2

(8) Find the total fine amount that members who have borrowed books have had to pay.

```
MATCH (m:member)<-[r:borrow]->(b:book)
RETURN m.name, SUM(r.fine_amount) as TotalFineAmount
```

"m.name"	"TotalFineAmount"
"Mian Shahid"	0.0
"Sajjad Hassnain"	0.0
"Khan Jahanzaib"	3.0
"Bilal Ahmad"	4.0
"Suhail Jan"	1.0

(9) Find title and genres of books

```
MATCH (b:book)<-[:PART_OF]->(c:category)
RETURN b.title as Title, c.genres
```

"Title"	"c.genres"
"Database Systems"	"Information system"
"Fundamentals of Python"	"Information system"
"Fundamentals of Python"	"Science"
"Statistics for Management and Economics"	"Business"
"Statistics for Management and Economics"	"Information system"
"All My Rage A Novel"	"Adventure"
"NoSQL Distilled"	"Science"
"NoSQL Distilled"	"Information system"
"All of Our Demise"	"Horror"
"All of Our Demise"	"Fantasy"

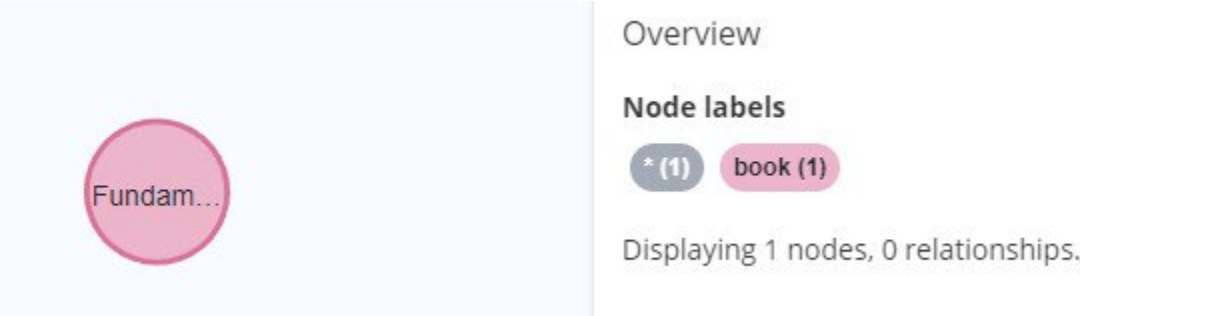
III. Designing Advanced Quarries:

Prepare at least 6 advanced queries to retrieve data from two or more collections. All queries should have clear and nice formatted results. (3 marks)

(1) Retrieve all information on the books that have borrowing due date is today.

```
MATCH (m:member)<-[r:borrow]->(b:book)
WHERE r.due_date = date("2022-11-12")
RETURN b
```

```
╒═══════════════════════════════════════════════════════════════════════════════╕
│"b"                                                                            │
╞═══════════════════════════════════════════════════════════════════════════════╡
│{"publisher_id":"pub01","instore_availability":true,"online_availabili│
│ty":true,"ISBN":77002,"publication_date":2010,"edition":"5th","title":│
│"Fundamentals of Python","quantity_in_stock":6}                                │
└───────────────────────────────────────────────────────────────────────────────┘
```



(2) List the book were borrowed between Oct 5, 2022 and Oct 15, 2022

```
MATCH (m:member)<-[r:borrow]->(b:book)
WHERE r.date_borrow >= date("2022-10-05")
AND r.date_borrow <= date("2022-10-15")
RETURN b
```

```
"b"
{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77001,"publication_date":2009,"edition":"9th","title":"Database Systems","quantity_in_stock":5}
{"publisher_id":"pub03","instore_availability":true,"online_availability":false,"ISBN":88002,"publication_date":2022,"edition":"1st","title":"All My Rage A Novel","quantity_in_stock":4}
{"publisher_id":"pub02","instore_availability":true,"online_availability":false,"ISBN":88001,"publication_date":2022,"edition":"1st","title":"All of Our Demise","quantity_in_stock":3}
```


(3) Find the allowed borrowing period of the books that have been borrowed.

```
MATCH (m:member)<-[r:borrow]->(b:book)
RETURN b.title, duration.inDays(r.date_borrow, r.due_date).days as borrowingPeriod
```

"b.title"	"borrowingPeriod"
"Database Systems"	10
"Fundamentals of Python"	14
"All My Rage A Novel"	21
"All My Rage A Novel"	20
"NoSQL Distilled"	20
"All of Our Demise"	20

(4) Find the books with their title that have not been return yet

```
MATCH (m:member)<-[r:borrow]->(b:book)
WHERE r.return_date = 'n/a'
RETURN m.name as Member,b.title as BookHasNotBeenReturn, b.ISBN as ISBN
```

"Member"	"BookHasNotBeenReturn"	"ISBN"
"Sajjad Hassnain"	"Fundamentals of Python"	77002
"Khan Jahanzaib"	"All My Rage A Novel"	88002
"Suhail Jan"	"All of Our Demise"	88001

(5) Count the number of books that have category as ‘Information system’

```
MATCH (b:book)<-[:PART_OF]->(c:category)
WHERE c.genres = 'Information system'
RETURN COUNT(b)
```

"COUNT(b)"
4

(6) Retrieve all information on the books that have title contain "Python"

```
MATCH (b:book)
WHERE b.title CONTAINS 'Python'
RETURN b
```

```
"b"
{"publisher_id":"pub01","instore_availability":true,"online_availability":true,"ISBN":77002,"publication_date":2010,"edition":"5th","title":"Fundamentals of Python","quantity_in_stock":6}
```

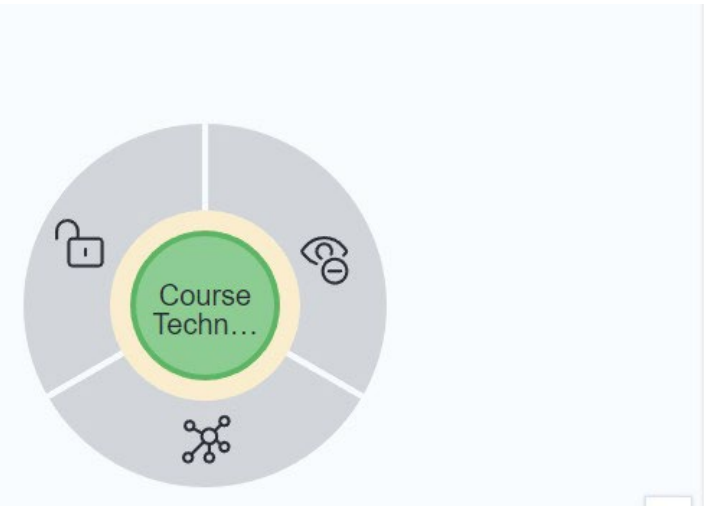
IV. Updating and deleting database content:

Prepare at least 4 commands for updating different collections and the same for the other 4 deleting database content commands. (2 marks)

(1) Update location of publisher “Course Technology” as “Florida, USA”

```
MATCH (p:publisher{publisher_name: "Course Technology"})
SET p.publisher_location = 'Florida, USA'
RETURN p
```

```
"p"
{"publisherid":"pub01","publisher_name":"Course Technology","publisher
_location":"Florida, USA"}
```



Node properties

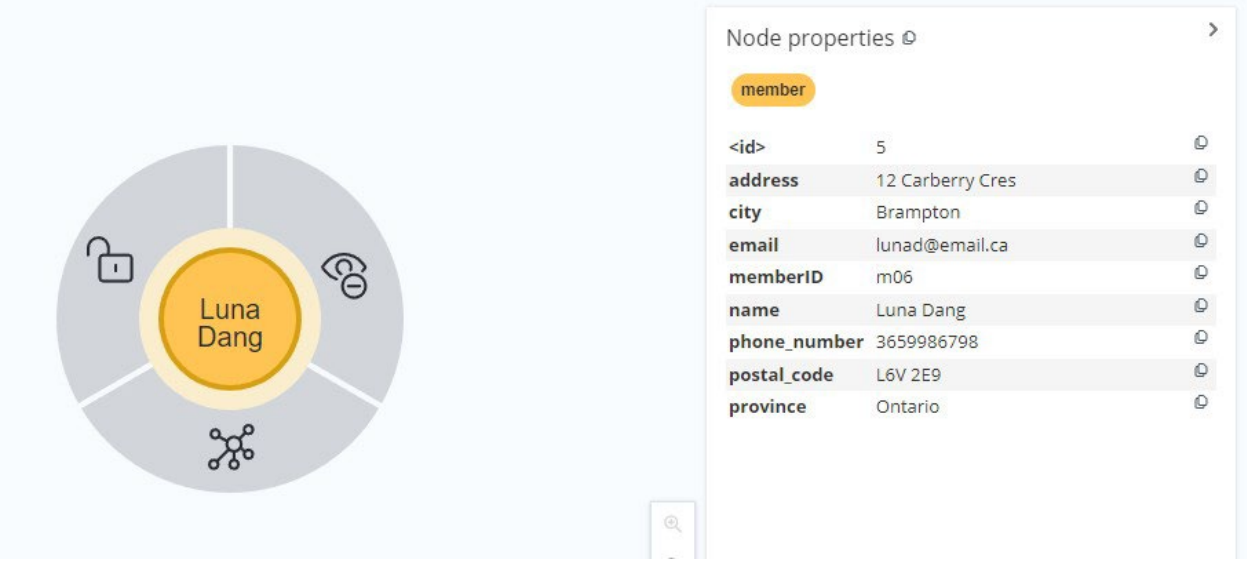
publisher

<id>	23
publisher_location	Florida, USA
publisher_name	Course Technology
publisherid	pub01

(2) Update new email of member “Luna Dang” as “lunad@email.ca”

```
MATCH (m:member{name: "Luna Dang"})
SET m.email = 'lunad@email.ca'
RETURN m
```

```
"m"
{"address":"12 Carberry Cres","province":"Ontario","city":"Brampton","name":"Luna Dang","phone_number":3659986798,"postal_code":"L6V 2E9","email":"lunad@email.ca","memberID":"m06"}
```

(3) Update Fine amount as $1.00 for books that have due date is "2022-11-12" but have not been returned yet.

```
MATCH (m:member)<-[r:borrow]->(b:book)
WHERE r.due_date >= date("2022-11-12")
SET r.fine_amount = 1.00
RETURN m.name, b.title, r
```


"m.name"	"b.title"	"r"
"Sajjad Hassnain"	"Fundamentals of Python"	{"Payment_date":"n/a","payment_status":"n/a","due_date":"2022-11-12","date_borrow":"2022-10-29","fine_amount":1.0,"return_date":"n/a"}

(4) Update the payment status as Paid, Payment_date and return_date as today for the member with memberID: ‘m04’ cand the book ISBN as 88002

```
MATCH (m:member{memberID: 'm04'})<-[r:borrow]->(b:book{ISBN: 88002})
SET r.payment_status = 'PAID', r.return_date = date()
Return m.name, b.title, r.return_date
```

"m.name"	"b.title"	"r.return_date"
"Khan Jahanzaib"	"All My Rage A Novel"	"2022-12-03"

(5) Delete quantity_in_stock field of the books that are not available in store.

```
MATCH (b:book)
WHERE b.instore_availability = False
REMOVE b.quantity_in_stock
RETURN b
```

"b"
{"publisher_id":"pub01","instore_availability":false,"online_availability":true,"ISBN":77003,"publication_date":2018,"edition":"11th","title":"Statistics for Management and Economics"}

(6) Delete the genres "Cookbook" in Categories collection

```
MATCH (c:category {genres: 'Cookbook'})
DELETE c
RETURN c
```

"c"
{}

(7) Delete the book borrowing record where fine was paid

```
MATCH (m:member)<-[r:borrow]->(b:book)
WHERE r.payment_status = 'paid'
DELETE r
RETURN r
```

```
"r"
{}
{}
```

(8) Find member who has not borrowed books and delete them

```
MATCH (m:member)
WHERE NOT (m)<-[:borrow]->()
RETURN m
```


```
"m"
{"address":"2024 mosque cres","province":"Ontario","city":"Mississauga","name":"Bilal Ahmad","phone_number":6475622134,"postal_code":"MJ7 2E7","email":"bilal@protonmail.com","memberID":"m03"}
{"address":"12 Carberry Cres","province":"Ontario","city":"Brampton","name":"Luna Dang","phone_number":3659986798,"postal_code":"L6V 2E9","email":"lunad@email.ca","memberID":"m06"}
```


```
MATCH (m:member)
WHERE NOT (m)<-[:borrow]->()
DELETE m
RETURN m
```