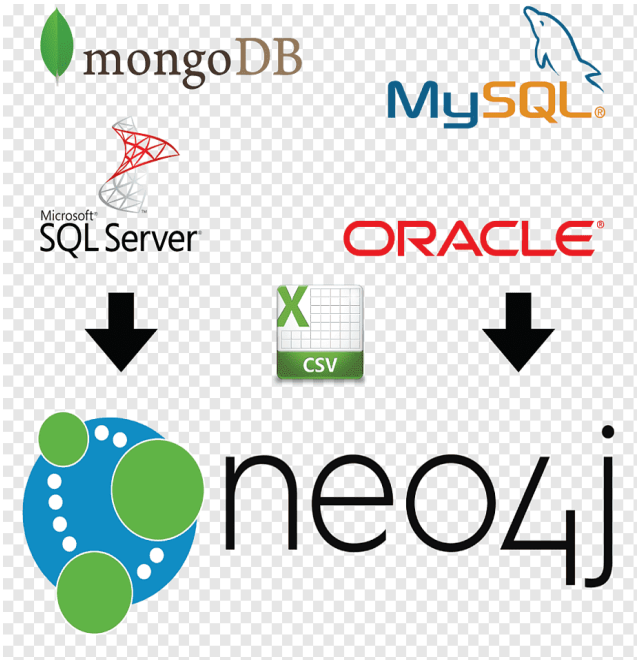

CASINO MANAGEMENT SYSTEM

Assignment 2

ABSTRACT

Use of Graph Database neo4j to create the casino management system

Advance Database Management

Pravakar Panta-s335675
Haixiao Dai-s331339
Himal Chapagain-s339419

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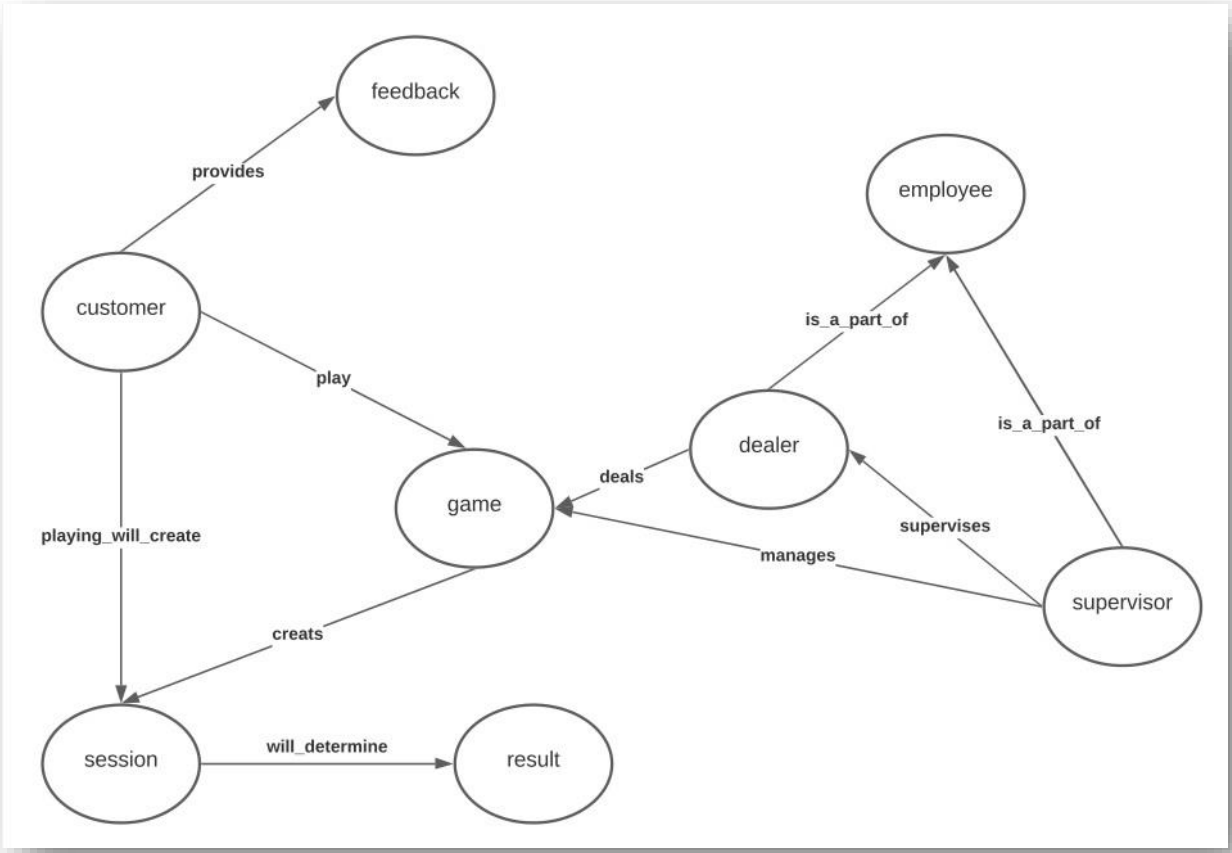
Casino Management System

A casino management system is developed in neo4j capturing all the business requirements. Sample queries have been provided to demonstrate the efficiency of the system. Also graph similarity algorithm has been implemented to demonstrate the ability to deal with graph data science library in neo4j.

Sample graph design of the system

It was difficult to capture all the labels and their association in neo4j, so we have used Lucid chart to develop the graph.



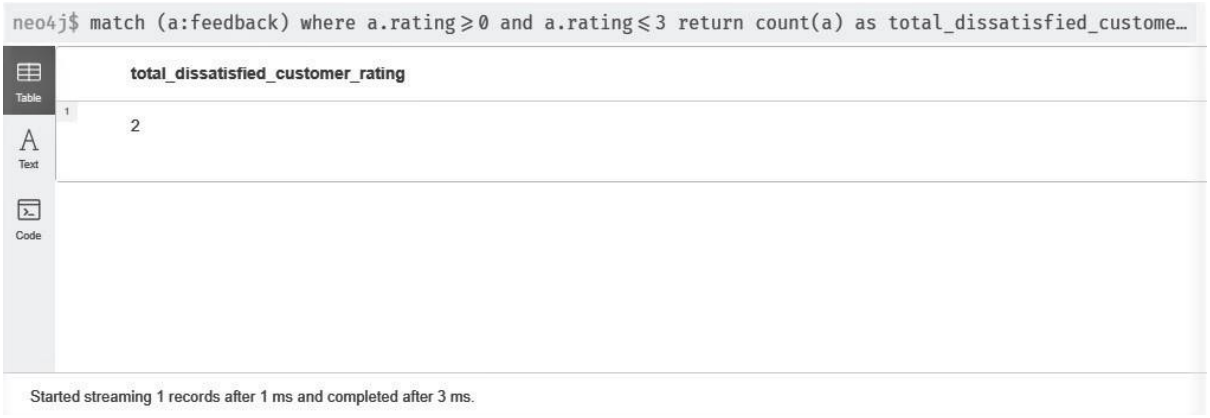
Cyphers

After the development of the system, business manager has asked for certain information for decision making and policy making. Following section discuss about the requirement that the business has and the report that satisfy the requirement of the business. All the reports have been generated by the cypher queries.

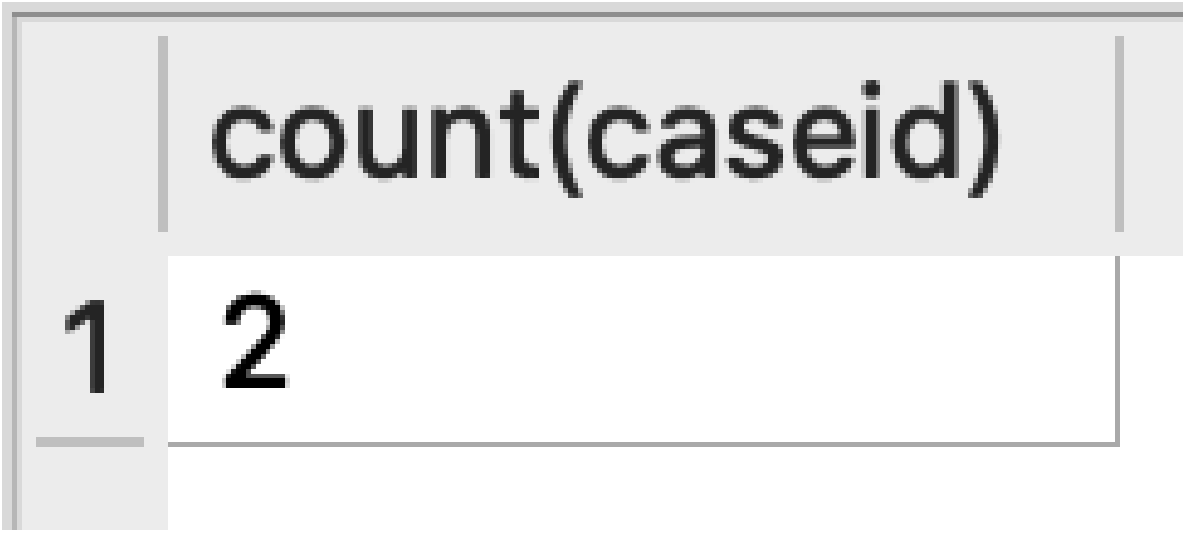
Cypher 1

There has been rumours that customers have been dissatisfied with the service casino provided. Casino Manager wants to keep tracking the total number of cases that customers provided dissatisfied feedbacks to the casino. Managers want to use range of 0 to 3 in customer rating to determine the dissatisfied cases.

Result from cypher



Result from SQL



Cypher 2

As a part of customer service audit, customer relations manager wants to get the feedback associated with every customer. He wants to go through feedback and acknowledge if the customers are happy with the service and thank them for providing the feedback. Also, he wants to write the explanation email if the customer the customer feel that they are dissatisfied with the service and ask for suggestions to make it a better experience.

Result from Cypher

```
neo4j$ MATCH (b:customer)-[:provides]→(c:feedback) return b.userid,b.membership,c.caseid,c.content,c.rat…
```

	b.userid	b.membership	c.caseid	c.content	c.rating	b.fullname	b.email	b.dob	b.discipline_status
1	"c1"	"bronze"	"f1"	"very satisfied"	5	"Nathan Smith"	"c1@gamil.com"	"1/01/1995"	"normal"
2	"c2"	"bronze"	"f2"	"satisfied"	3	"James Wang"	"c2@gamil.com"	"2/01/1995"	"third warning"
3	"c3"	"diamond"	"f3"	"disappointed"	1	"Jeff Evans"	"c3@gamil.com"	"2/01/1996"	"second warning"
4	"c4"	"gold"	"f4"	"very happy"	5	"Chirs Bennet"	"c4@gamil.com"	"2/01/1996"	"first warning"
5	"c1"	"bronze"	"f5"	"greate job"	5	"Nathan Smith"	"c1@gamil.com"	"1/01/1995"	"normal"

Started streaming 5 records after 1 ms and completed after 3 ms.

Result from SQL Query

	userid	members	caseid	content	rating	userid:1	userid:2	fullname	email	dob	discipline_status
1	c1	bronze	f1	very satisfied	5	c1	c1	Nathan Smith	c1@gamil.com	1995-01-01	normal
2	c2	bronze	f2	satisfied	3	c2	c2	James Wang	c2@gamil.com	1995-01-02	third warning
3	c3	diamond	f3	disappointed	1	c3	c3	Jeff Evans	c3@gamil.com	1996-01-02	second warning
4	c4	gold	f4	very happy	5	c4	c4	Chirs Bennet	c4@gamil.com	1996-01-02	first warning
5	c1	bronze	f5	greate job	5	c1	c1	Nathan Smith	c1@gamil.com	1995-01-01	normal

Cypher 3

If a customer spends more than $1000 in a session, the casino will consider this customer could potentially be addicted to the game. As a responsible gaming service provider, the manager wants to find customers that spend $1000 or more in a session and this customer did these three times or more so that the manager can send reminders to those customers to prevent those customers from being addicted to the game.

Result from Cypher

```
neo4j$ match (c:customer)-[:playing_will_create]→(s:session),(s:session)-[:will_determine]→(r) where r.…
```

	customer_id	c.fullname	c.email	c.dob	c.discipline_status	number_of_times_bought_in_morethan_1000	is_patron_addicted
1	"c1"	"Nathan Smith"	"c1@gamil.com"	"1/01/1995"	"normal"	4	true
2	"c2"	"James Wang"	"c2@gamil.com"	"2/01/1995"	"third warning"	3	true

Started streaming 2 records after 2 ms and completed after 19 ms.

Result from SQL

	userid	fullname	email	dob	discipline_status
1	c1	Nathan Smith	c1@gamil.com	1995-01-01	normal
2	c2	James Wang	c2@gamil.com	1995-01-02	third warning

Cypher 4: Use of Aggregate Function SUM

To provide the biggest spender with the special promotional voucher and to lure the customers who have won from casino with free gift hampers the casino shift manger wants to know the total profit or loss made from each player.

```
neo4j$ MATCH(c:customer)-[:playing_will_create]-()-[:will_determine]→(b:result) RETURN c.userid,c.fullname,c.dob,c…
```

Table | Text | Code

	c.userid	c.fullname	c.dob	c.email	Total_business_made_from_Player
1	"c1"	"Nathan Smith"	"1/01/1995"	"c1@gamil.com"	6765
2	"c2"	"James Wang"	"2/01/1995"	"c2@gamil.com"	3200
3	"c3"	"Jeff Evans"	"2/01/1996"	"c3@gamil.com"	536
4	"c4"	"Chirs Bennet"	"2/01/1996"	"c4@gamil.com"	-700
5	"c6"	"Pravakar Panta"	"10/10/1990"	"c6@gmail.com"	-500
6	"c7"	"Himal Chapagain"	"10/10/1991"	"c7@gmail.com"	700
7	"c8"	"Hax Dai"	"10/10/1992"	"c8@gmail.com"	900

Cypher 5: Use of aggregate function COLLECT

Business development manager wants to know all the session played by all the player for policy making.

```
neo4j$ MATCH (c:customer)-[:playing_will_create]→(session) RETURN c.fullname as FULL_NAME,COLLECT(session.sessioni…
```

Table | Text | Code

	FULL_NAME	LIST_OF_SESSIONS
1	"Nathan Smith"	["ses1", "ses7", "ses6", "ses8"]
2	"James Wang"	["ses9", "ses2", "ses3"]
3	"Jeff Evans"	["ses4"]
4	"Chirs Bennet"	["ses5"]
5	"Pravakar Panta"	["ses10"]
6	"Himal Chapagain"	["ses11"]
7	"Hax Dai"	["ses12"]

Cypher 6: Use of Aggregate Function MAX

New gamble responsibly rules states that casino should restrict player for 1 week from playing if he/she spends losses more than 5000 in a session. As a result of gamble responsibly, casino wants to know the biggest loss by each player.

```
neo4j$ MATCH (c:customer)-[:playing_will_create]→()-[:will_determine]→ (a:result) WHERE a.difference>0 …
```

Table | Text | Code

	c.fullname	Biggest_Loss
1	"Nathan Smith"	3000
2	"James Wang"	1200
3	"Jeff Evans"	380
4	"Himal Chapagain"	700
5	"Hax Dai"	900

Started streaming 5 records after 2 ms and completed after 8 ms.

Cypher 7: Use of Predicate function EXISTS

Customer relation audit demanded the customer relation manager to find out which customer has provided feedback and which customer has not provided feedback.

```
neo4j$ MATCH (n:customer) WHERE EXISTS (n.fullname) RETURN n.fullname AS name, EXISTS ((n)-[:provides]→()) AS prov…
```

Table | Text | Code

	name	provided_Feedback
1	"Nathan Smith"	true
2	"James Wang"	true
3	"Jeff Evans"	true
4	"Chirs Bennet"	true
5	"Matt Jones"	false
6	"Pravakar Panta"	true
7	"Himal Chapagain"	false
8	"Hax Dai"	true

Cypher 8: Use of Mathematical Function SIGN

Casino Boss wants to know about all the loss the casino has made so as to develop a strategy to get those money back.

```
neo4j$ MATCH (c)-[:playing_will_create]→ (b)-[:will_determine]→ (a:result) where sign(a.difference) = -…
```

	b.userid	c.fullname	b.sessionid	a.difference
1	"c1"	"Nathan Smith"	"ses1"	-200
2	"c4"	"Chirs Bennet"	"ses5"	-700
3	"c6"	"Pravakar Panta"	"ses10"	-500

Started streaming 3 records after 1 ms and completed after 3 ms.

Cypher 9: Use of List function LABELS

List all the labels associated with *customer id* "c1".

```
neo4j$ MATCH (a) WHERE a.userid = 'c1' RETURN distinct labels(a)
```

	labels(a)
1	["customer"]
2	["feedback"]
3	["session"]

Started streaming 3 records after 3 ms and completed after 12 ms.

Cypher 10: Use of Predicate Function TYPE

IT department wants to know about all the patterns linked with customer id "c1" for policy making as he is the VIP customer.

```
neo4j$ MATCH (n)-[r]→() WHERE n.userid = 'c2' RETURN distinct type(r)
```

	type(r)
1	"rates"
2	"playing_will_create"
3	"plays"
4	"provides"
5	"will_determine"

Started streaming 5 records after 3 ms and completed after 12 ms.

Cypher 11: Graph Similarity Algorithm – Pearson Correlation

Since Nathan Smith and James Wang are the most VIP customers till date of the casino, the business development manger wants to see how similar their preference is when it comes to playing game. So he has asked the data scientist to find out whether there is any similarity in their rating or not.

```
neo4j$ MATCH (c1:customer {userid: 'c1'})-[rated:rates]→(game) WITH c1, gds.alpha.similarity.asVector(ga…
```

Table | Text | Code

	from	to	similarity
1	"Nathan Smith"	"James Wang"	-0.6324555320336759

Started streaming 1 records after 1 ms and completed after 3 ms.

Cypher 12: Graph Similarity Algorithm – Pearson Correlation

Now it has been established that our VIP guests have different choice when it comes to gambling at the casino. Now the business development manager wants to know about pair of guests who prefers to play exactly same type of game for the purpose of customized marketing.

```
neo4j$ MATCH (c:customer), (g:game) OPTIONAL MATCH (c)-[rated:rates]→(g) WITH {item:id(c), weights: coll…
```

Table | Text | Warn | Code

	from	to	similarity
1	"Jeff Evans"	"Hax Dai"	1.0
2	"James Wang"	"Himal Chapagain"	1.0
3	"Chirs Bennet"	"Matt Jones"	1.0

Started streaming 3 records after 1 ms and completed after 9 ms.