GRAPHDATABASES
BEIRUTMEETUP
VISITSALICANTE

NEO4J INTRODUCCIÓN A LAS BASES DE DATOS ORIENTADAS A GRAFOS

PONENTE
KINANE DOMLOJE

6:30 P.M
MARTES 14 de NOVIEMBRE

ULAB
PLAZA **DE SAN CRISTOBAL,** 14.

ULab
VINELAB
neo4j

We Are...

Abed Halawi

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@kinaneD

Graph Databases Beirut ● Meetup

Graph Databases Beirut

Home | Members | Sponsors | Photos | Pages | Discussions | More | Group tools | My profile

Beirut, Lebanon
Founded Jan 26, 2016

About us...

Invite friends

Graphistas 243
Past Meetups 3
Our calendar
Worldwide 59

Organizers:

Neo4j, Abed Hawi, Kinane

Contact

We're about:

Open Source · Database Professionals · Big Data · Database Development ·

There's interest in your group but nothing's on your calendar

Schedule a Meetup

11 people viewed your group last month!

Start a conversation... 140

Post

Welcome, Graphistas!

+ Schedule a new Meetup

Upcoming | Past | Conversations (1) | Calendar

What's new

VINELAB
WE EXPLOIT THE INTERSECTION OF
TECHNOLOGY, MEDIA & CELEBRITY
AMPLIFICATION

ABOUT US

WE DELIVER CELEBRITY AUDIENCE TO BRANDS

Vinelab -[:LOVES]-> Neo4j

Community Contributions

build passing

NeoEloquent

gitter join chat

PHP OGM for Neo4j

Quick Reference

- Installation
- Configuration
- Models
- Relationships
- Edges
- Migration
- Schema
- Aggregates
- Only in Neo
- Things To Avoid

By Michael Hunger, Developer Relations | July 22, 2015

In response to your many requests, we're happy to announce our first *semi-official* (i.e. beta release) Neo4j-Docker image.

It is *semi-official*, because it doesn't yet come with guarantees or official customer support and has not been as battle-tested as the rest of our product packaging. So expect the regular issues you might run into with any beta release.

First of all, I want to thank everyone in our community who already provided great Docker images for Neo4j. We took inspiration from those first attempts when creating our own. Special thanks to Abed Halawi, Kenny Bastani, and Ben Butler-Cole.

We're also grateful for the feedback that we already got in the discussion with these authors around the requirements and realisation of the image.

We made the recent versions available on Docker-Hub but you can also build it on your own from our GitHub Repository.

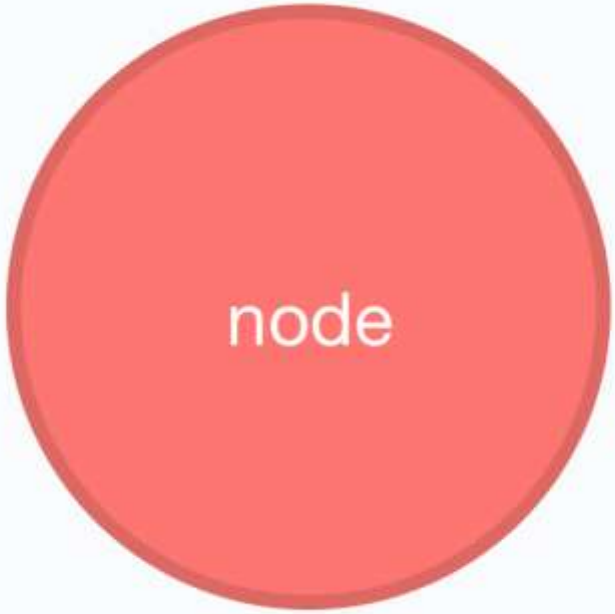
Overview

- What is a Graph Database?
- Why use a Graph Database?
- Cypher Query Language
- Neo4j UI Walkthrough
- Relational vs. Graph Databases
- My Personal Journey with Graph Databases
- Best Practices in Data Modeling

What is a Graph Database?

A Node

:Person



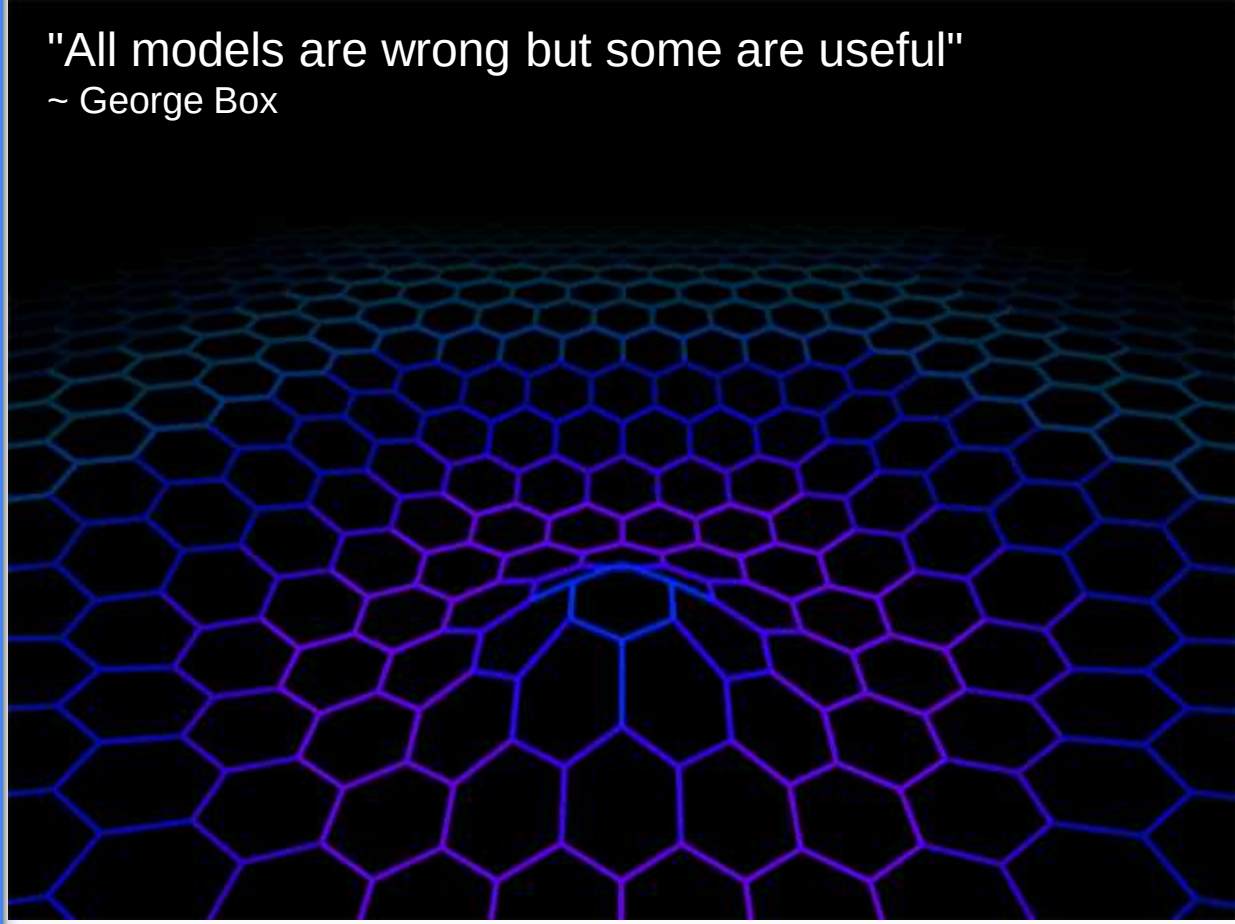

```
{
        id: 9928,
        name: John Doe,
        email: john@doe.me,
        created_at: 03-06-1969
}
```

What is a Graph?

Why use a Graph Database?

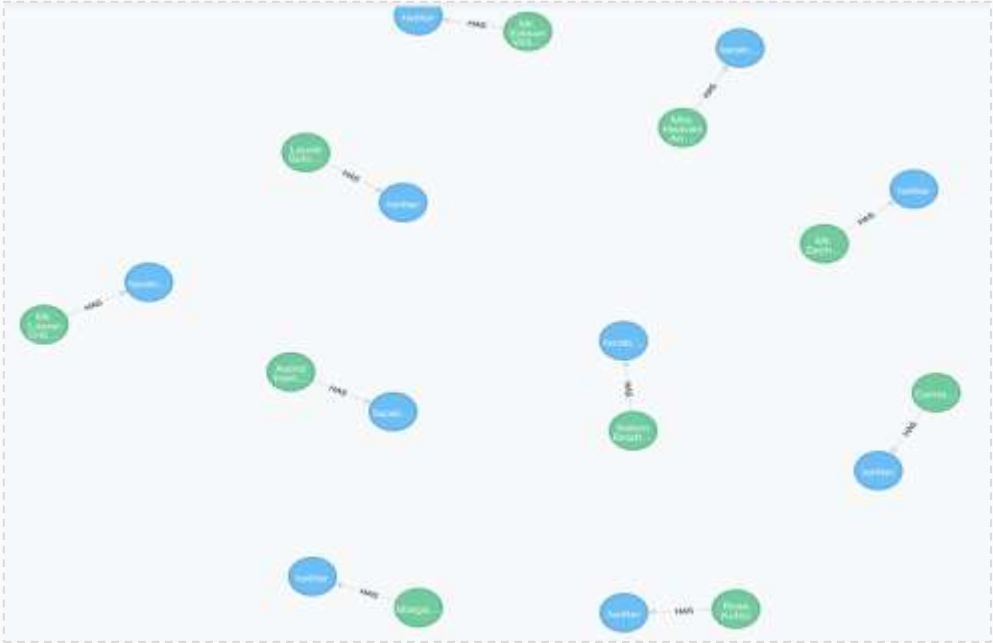
Flexibility

"All models are wrong but some are useful"
~ George Box



Schema-less Data Structures

Constraints

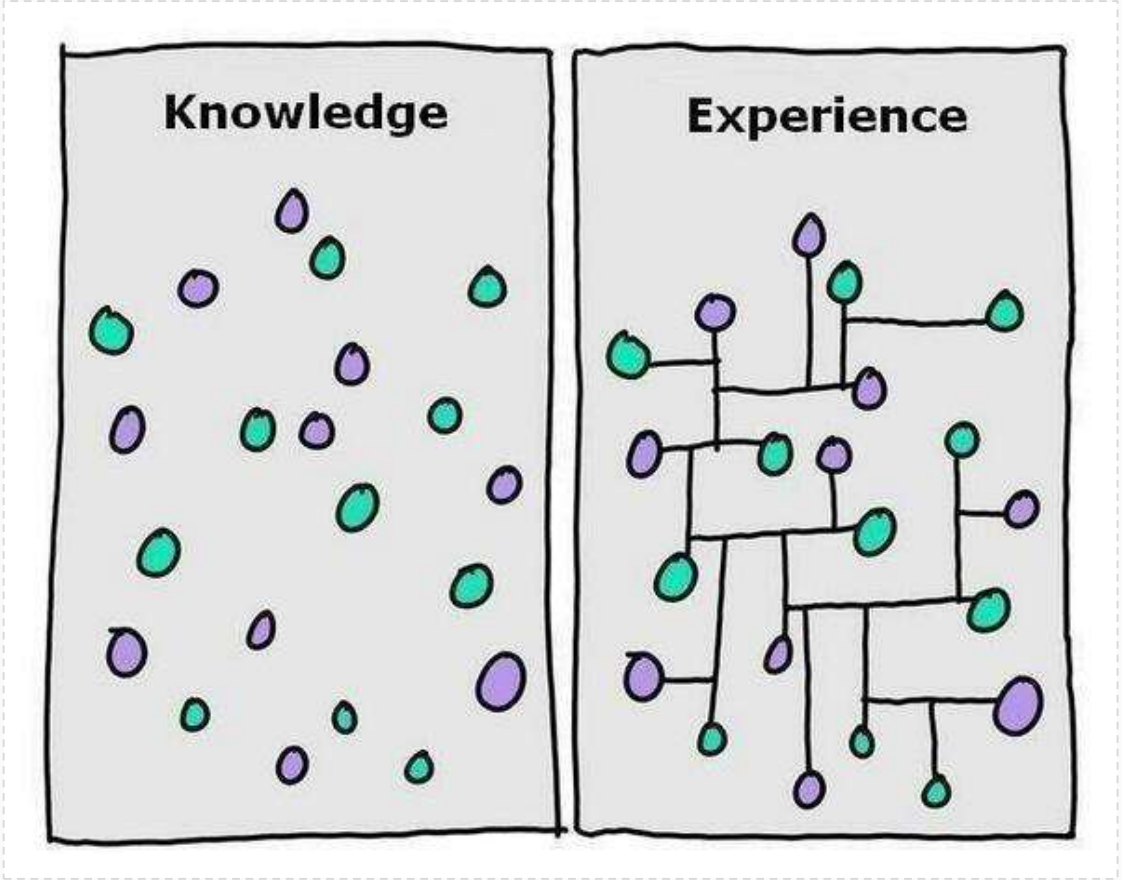


- Unique node properties
- Node property existence
- Relationship property existence
- Indexing

Performance

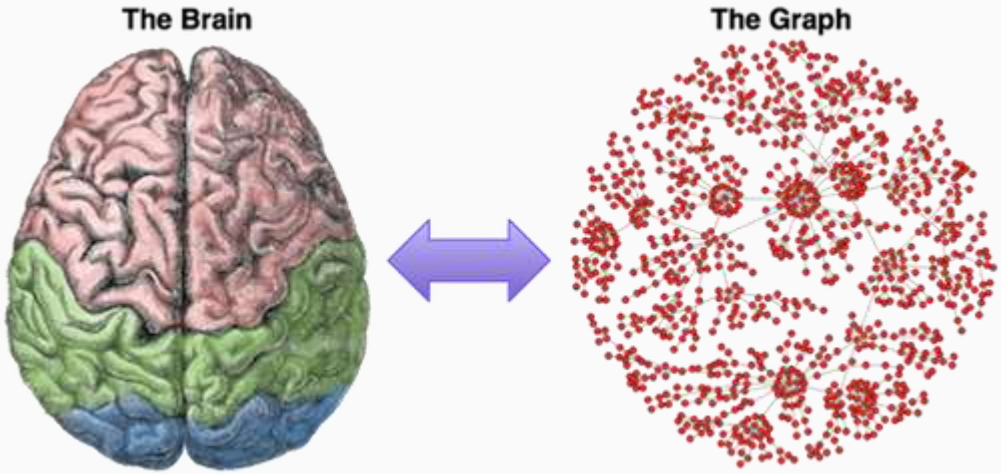
Creativity

Pleasant modelling and development experience.



What can you model with graph?

Anything, literally!



Cypher Query Language

Querying the graph database using Cypher

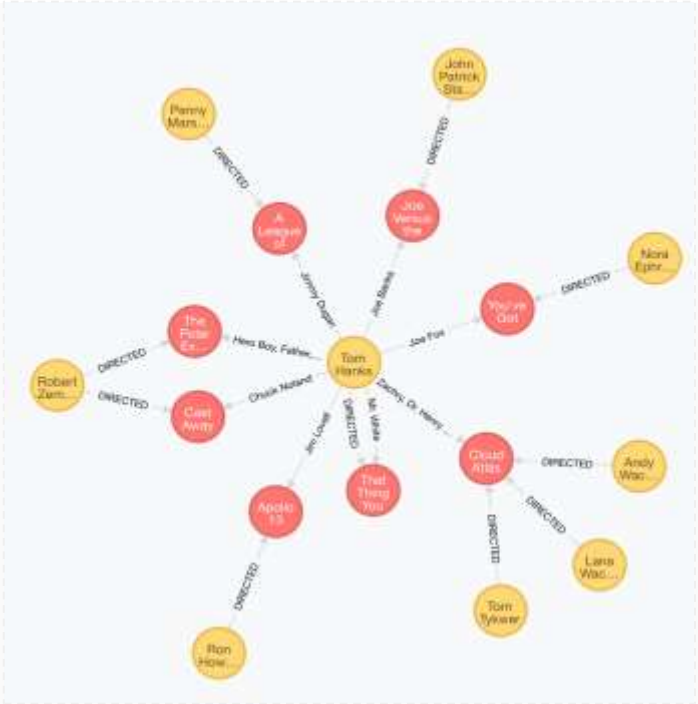
“Cypher is an expressive (yet compact) graph database query language”

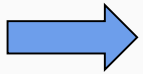
```
$ CREATE (:User { name: 'جان دو' })-[:FOLLOWS]->(:User { name: 'أليس' })
```

Cypher • MATCH-WHERE clause

The MATCH clause allows you to specify the patterns Neo4j will search for in the database.

```
$ MATCH (actor:Person)-[:ACTED_IN]->(movie) WHERE movie.title="Apollo 13" RETURN actor;
```





Other Cypher Clauses

`CREATE & MERGE`

create graph elements

`DELETE`

delete graph elements

`SET`

update labels and properties on nodes and relationships

`WITH`

Chains subsequent query parts and forward results from one to the next. Similar to piping commands in Unix.

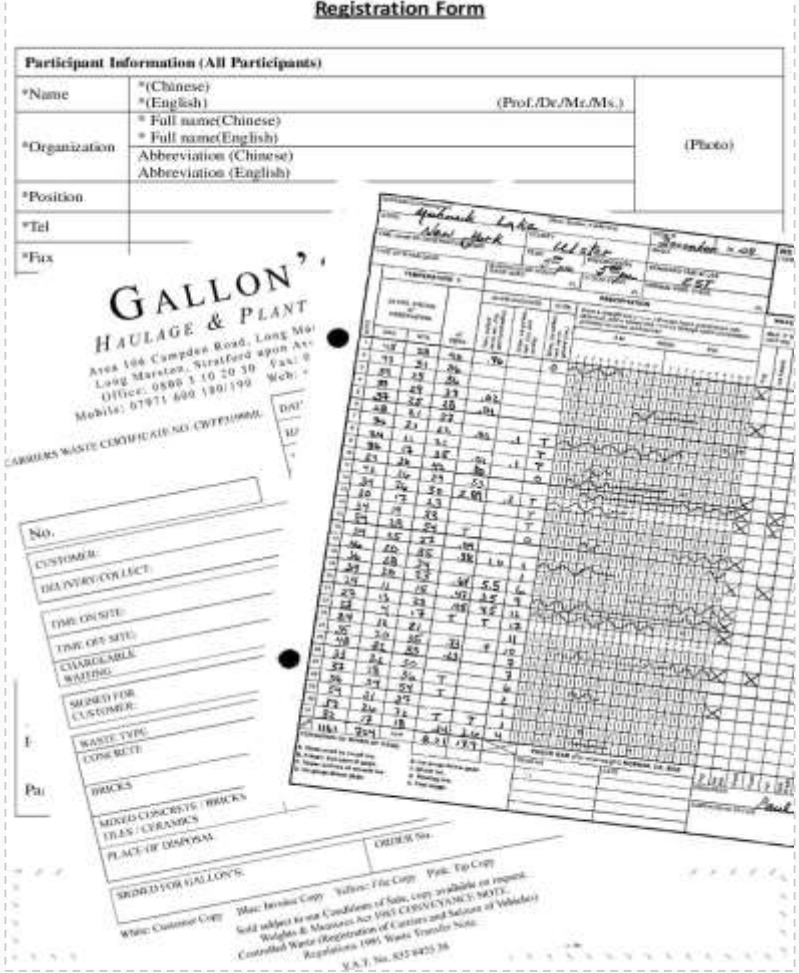
Aggregation & Statistics

`COUNT, AVG, MAX, MIN, DISTINCT,...`

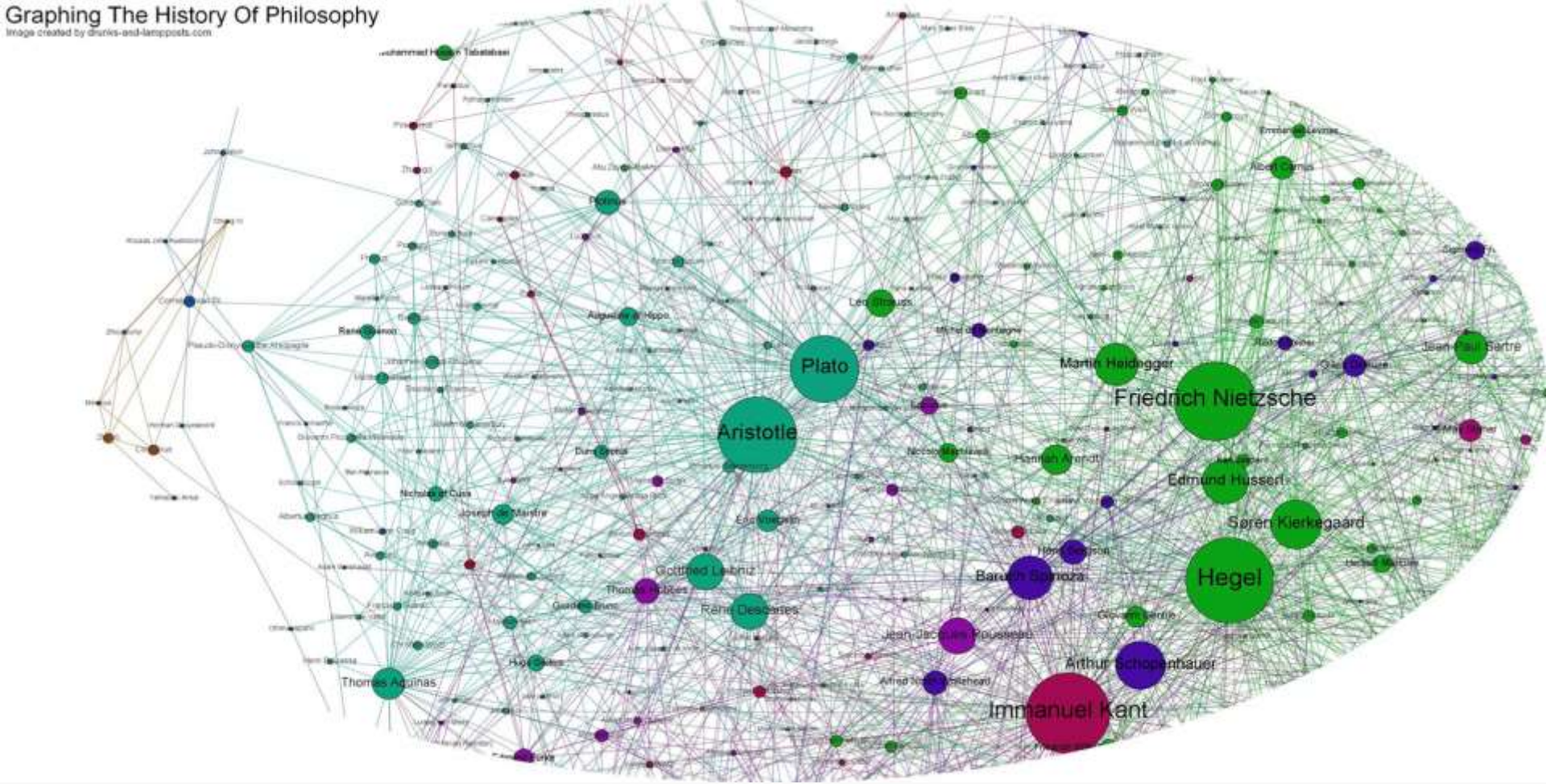
Neo4j UI Walkthrough

Break

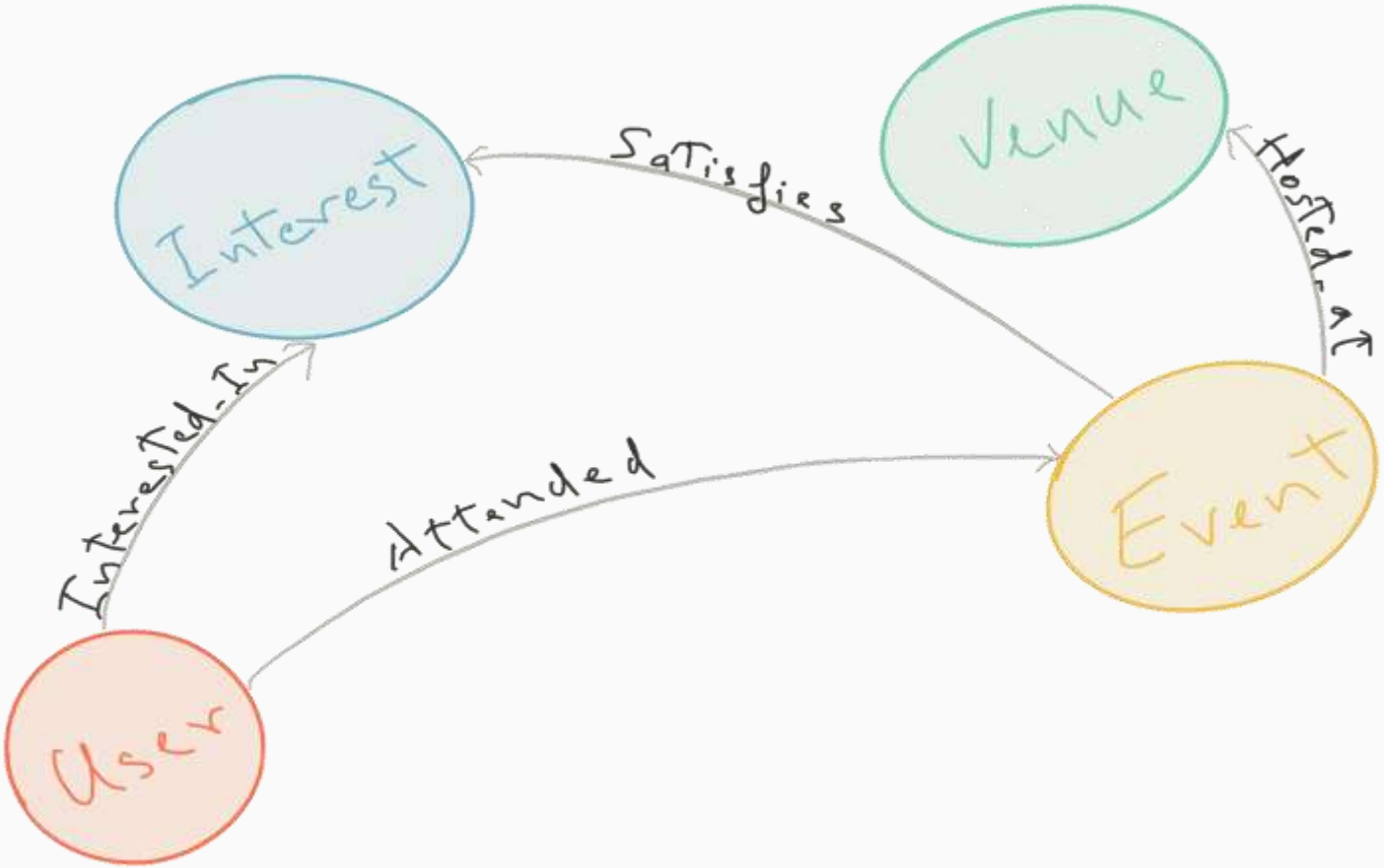
Relational vs Graph Databases



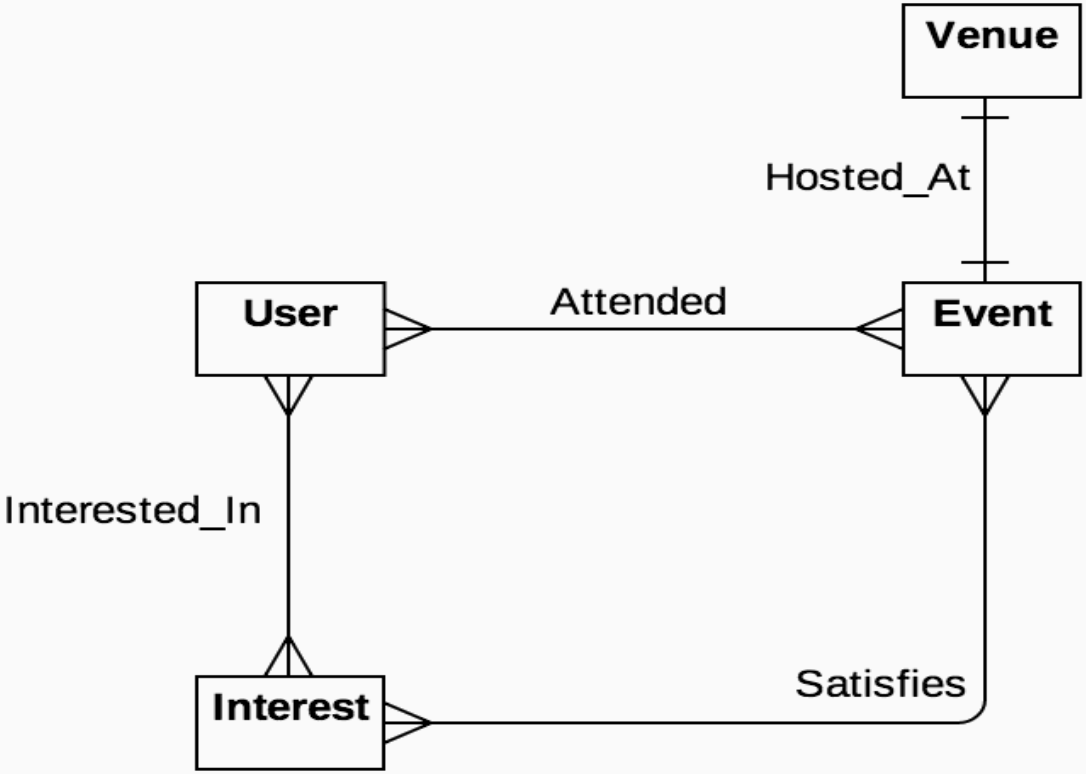
Tabular Data



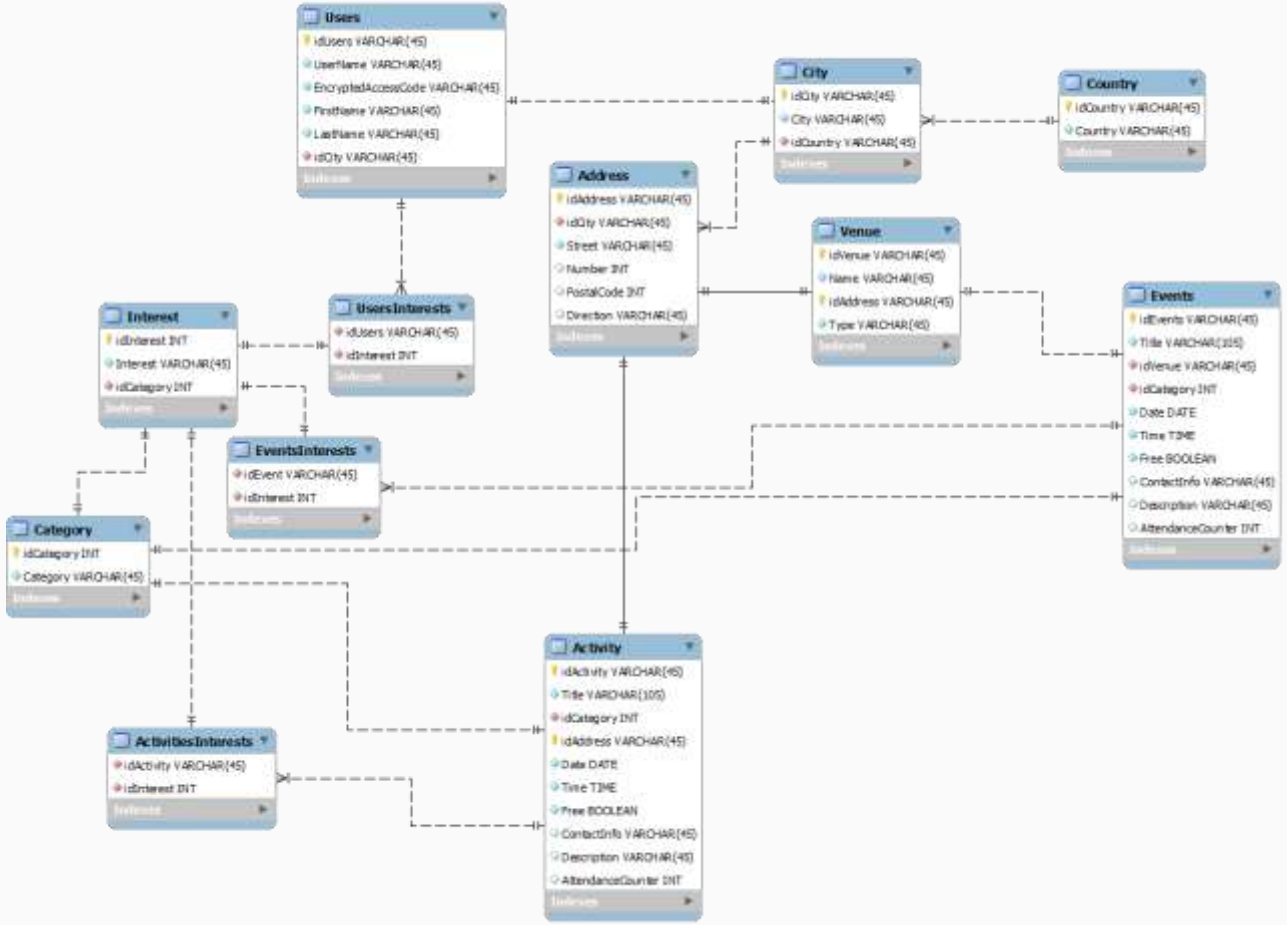
Real world data



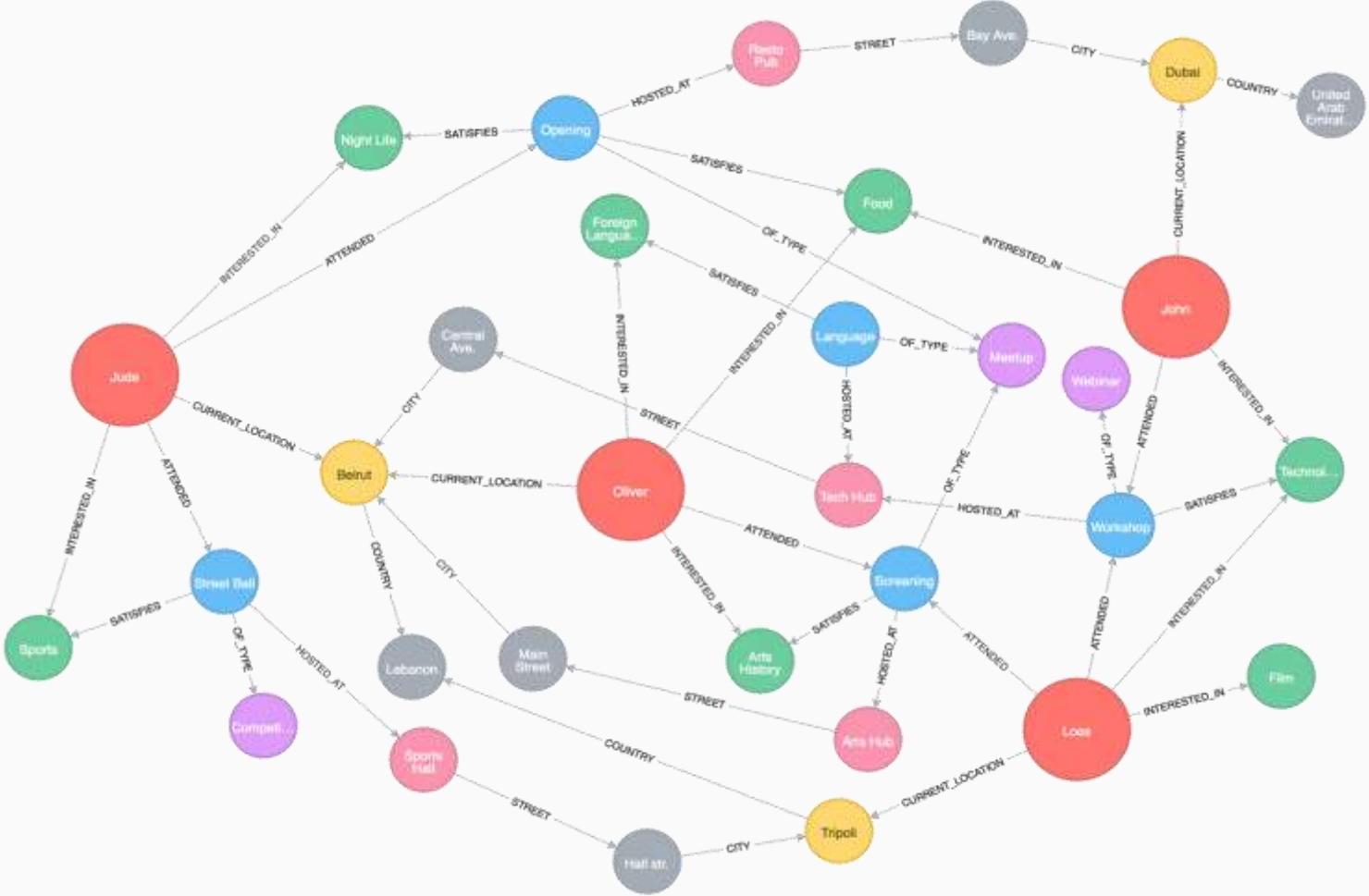
Conceptual Data Model



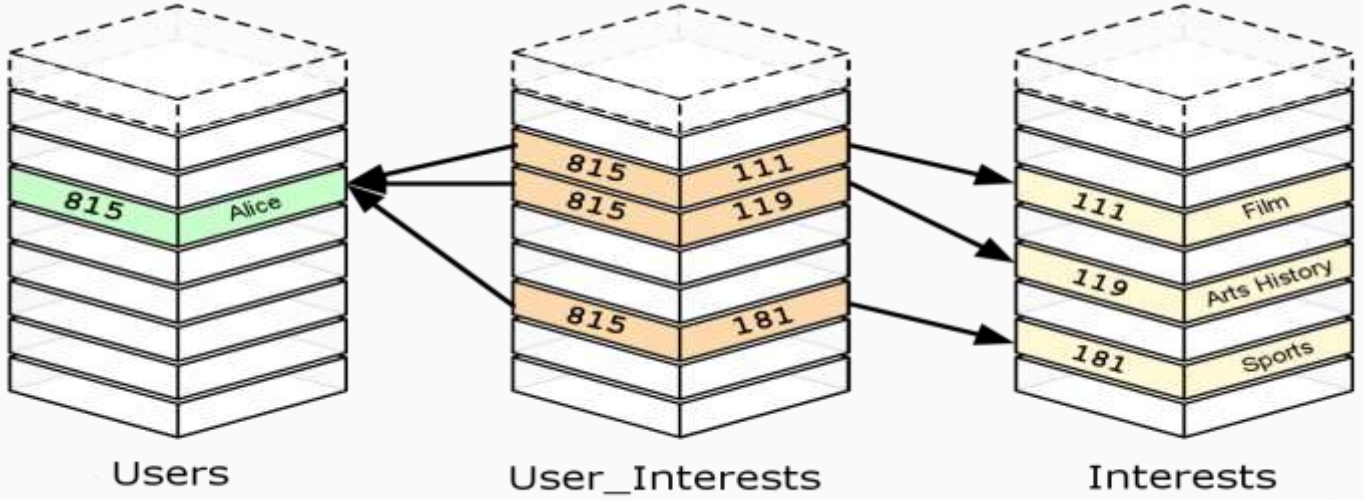
Logical Data Model: Relational



Physical Data Model: Relational



Physical Data Model: Graph



List the *interests of "Alice"*

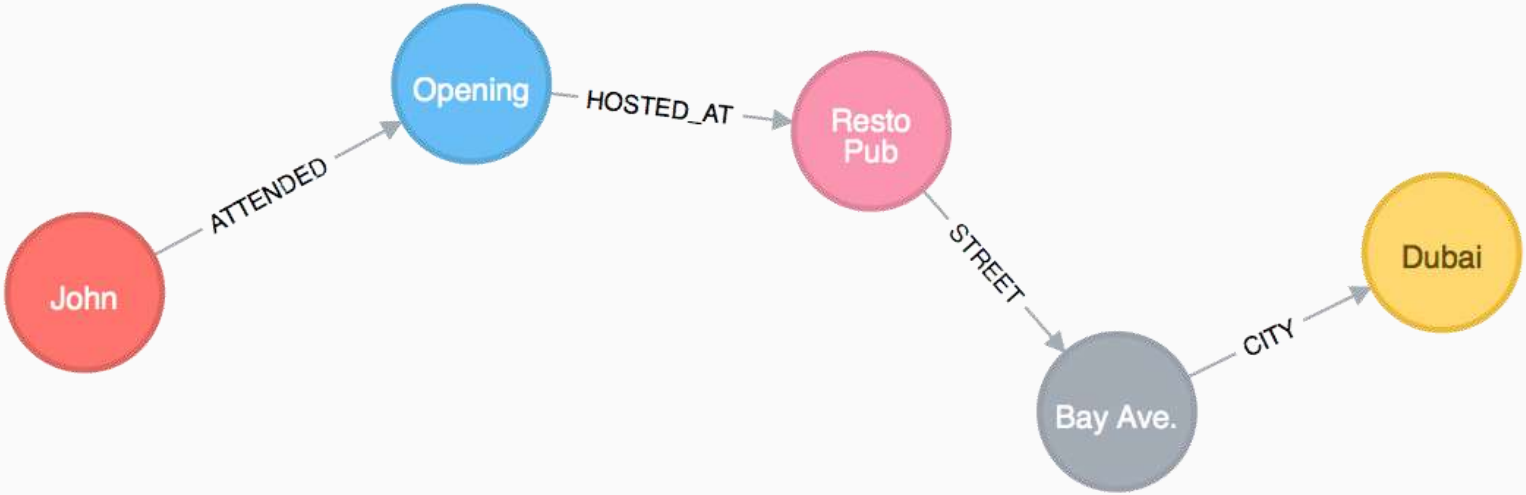
```
SELECT title FROM Interests
LEFT JOIN User_Interests
  ON Interests.Id = User_Interests.InterestId
LEFT JOIN Users
  ON Users.Id = User_Interests.UserId
WHERE Users.name = "Alice"
```

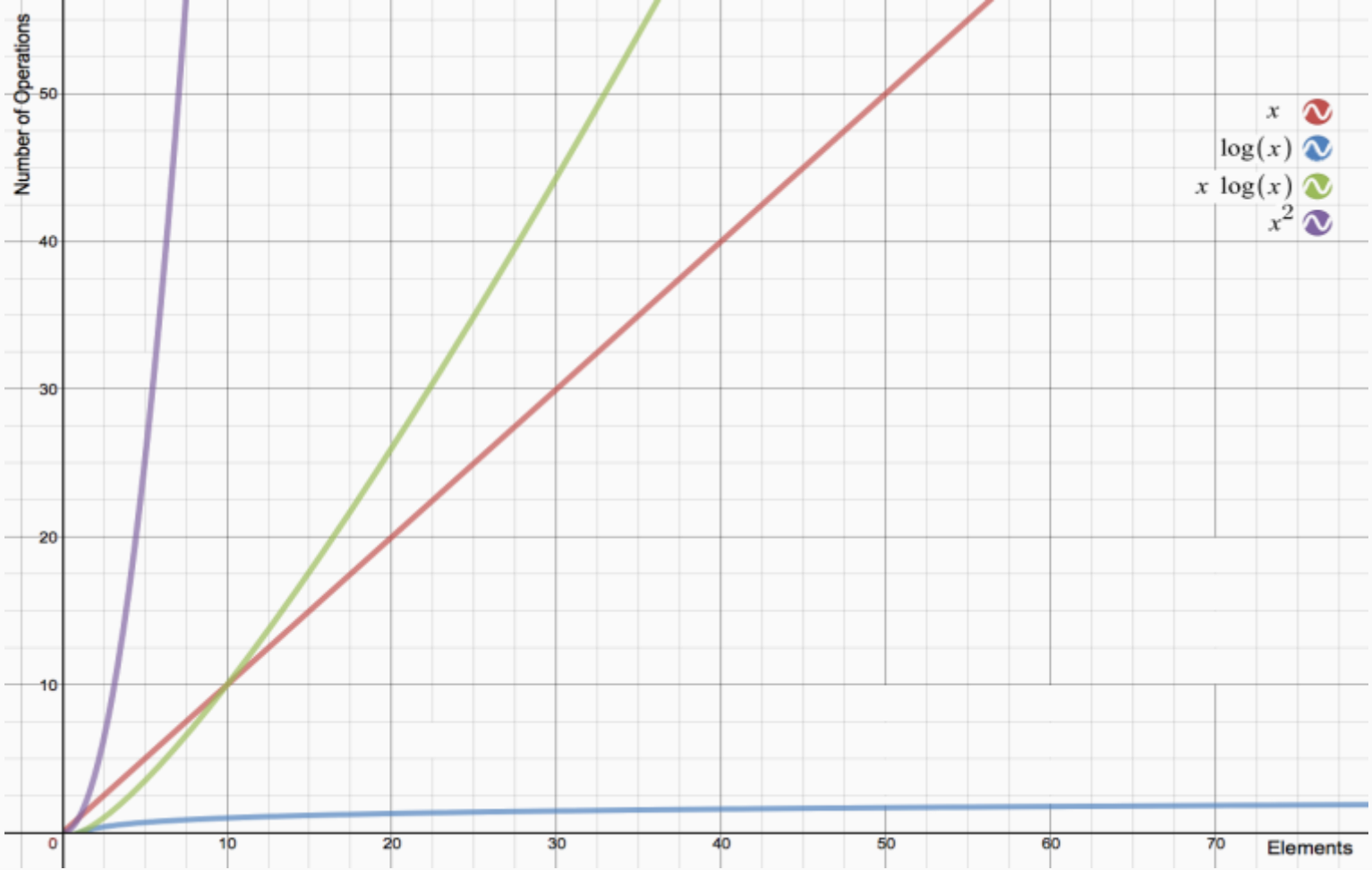
List the *interests of "Alice"*

```
MATCH (u:User)-[:INTERESTD_IN]->(i:Interest)
WHERE u.name = "Alice"
RETURN i.title
```

Where has John been lately?

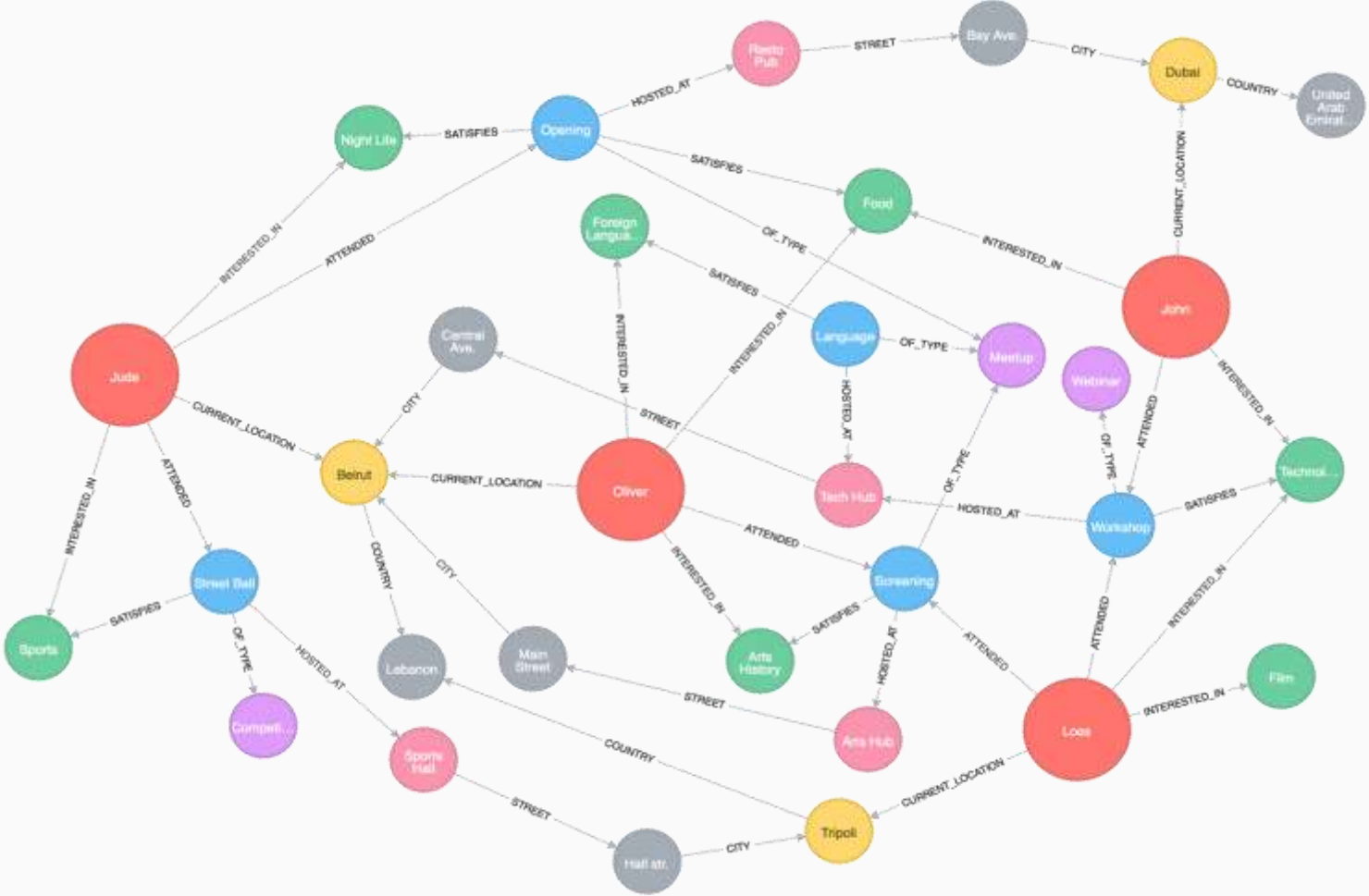
```
MATCH (user:User)-[:ATTENDED]->()-[:HOSTED_AT]->()-[:STREET|CITY *1..2]->(city:City)
WHERE user.name = 'John'
RETURN city;
```




Number of Operations
50
40
30
20
10
0
10
20
30
40
50
60
70
Elements
x
$\log(x)$
$x\ \log(x)$
x^2

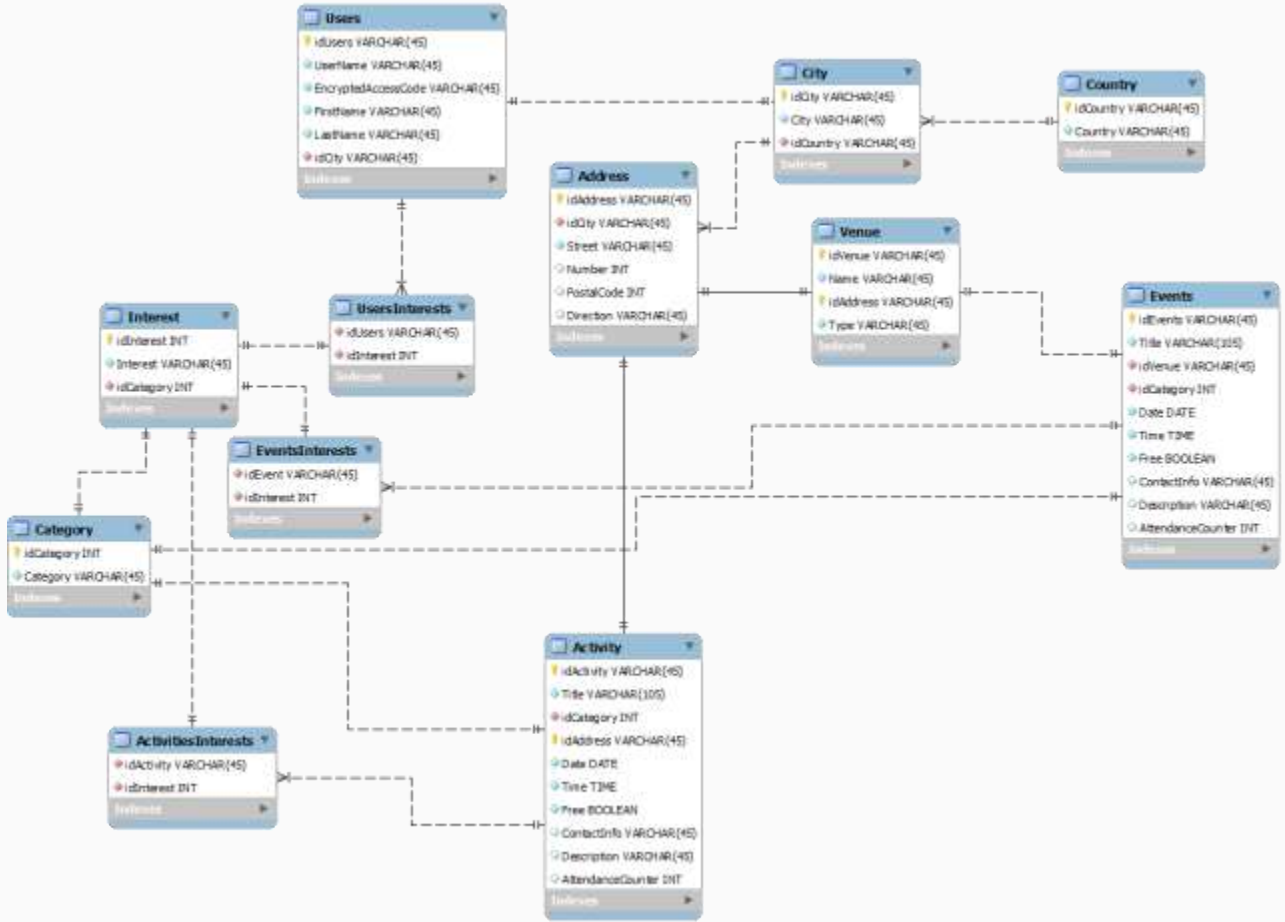
Depth	RDBMS execution time(s)	Neo4j execution time(s)	Records returned
2	0.016	0.01	~2500
3	30.267	0.168	~110,000
4	1543.505	1.359	~600,000
5	Unfinished	2.132	~800,000

Social Network:
1 million users
50 friend each

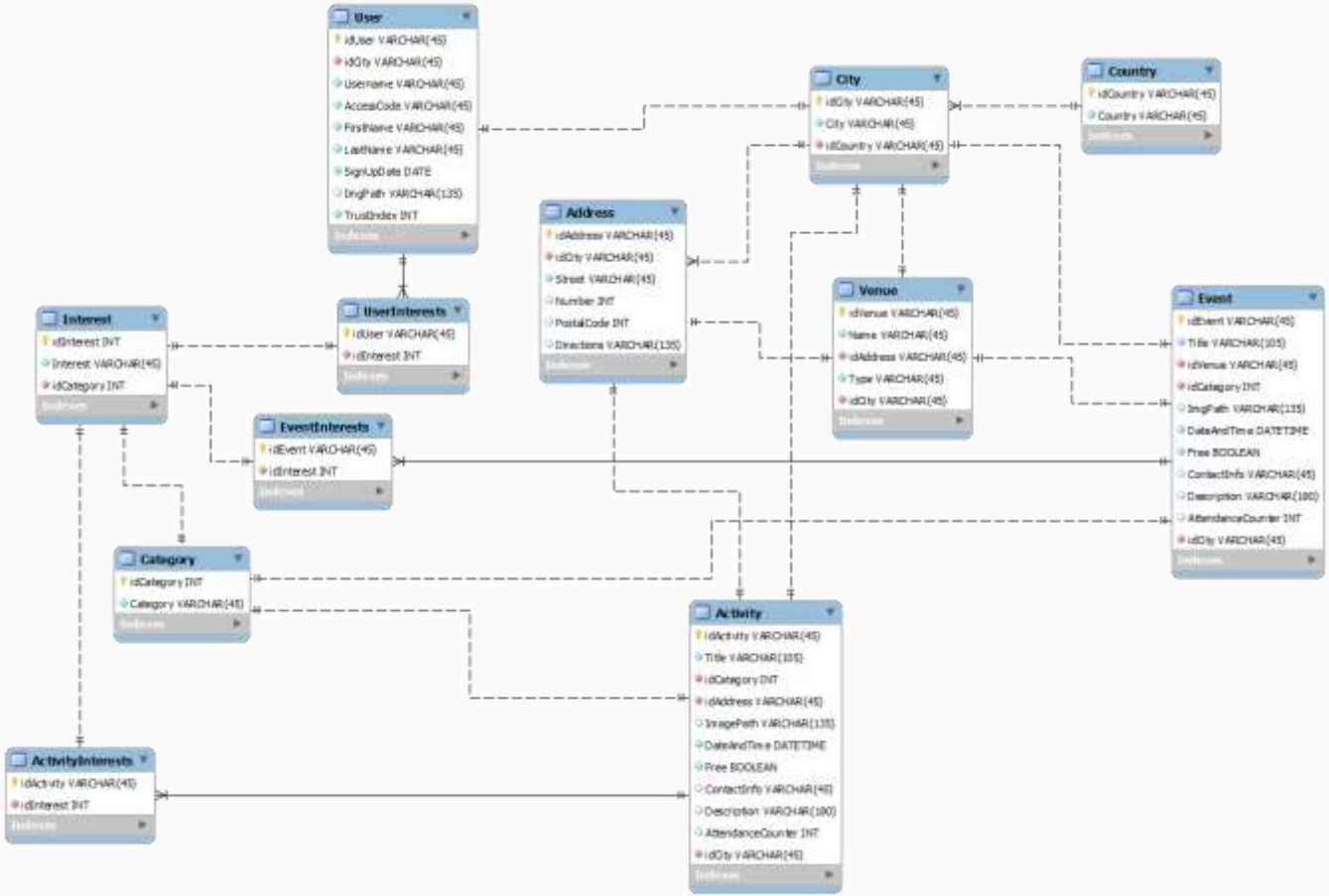


Flexibility

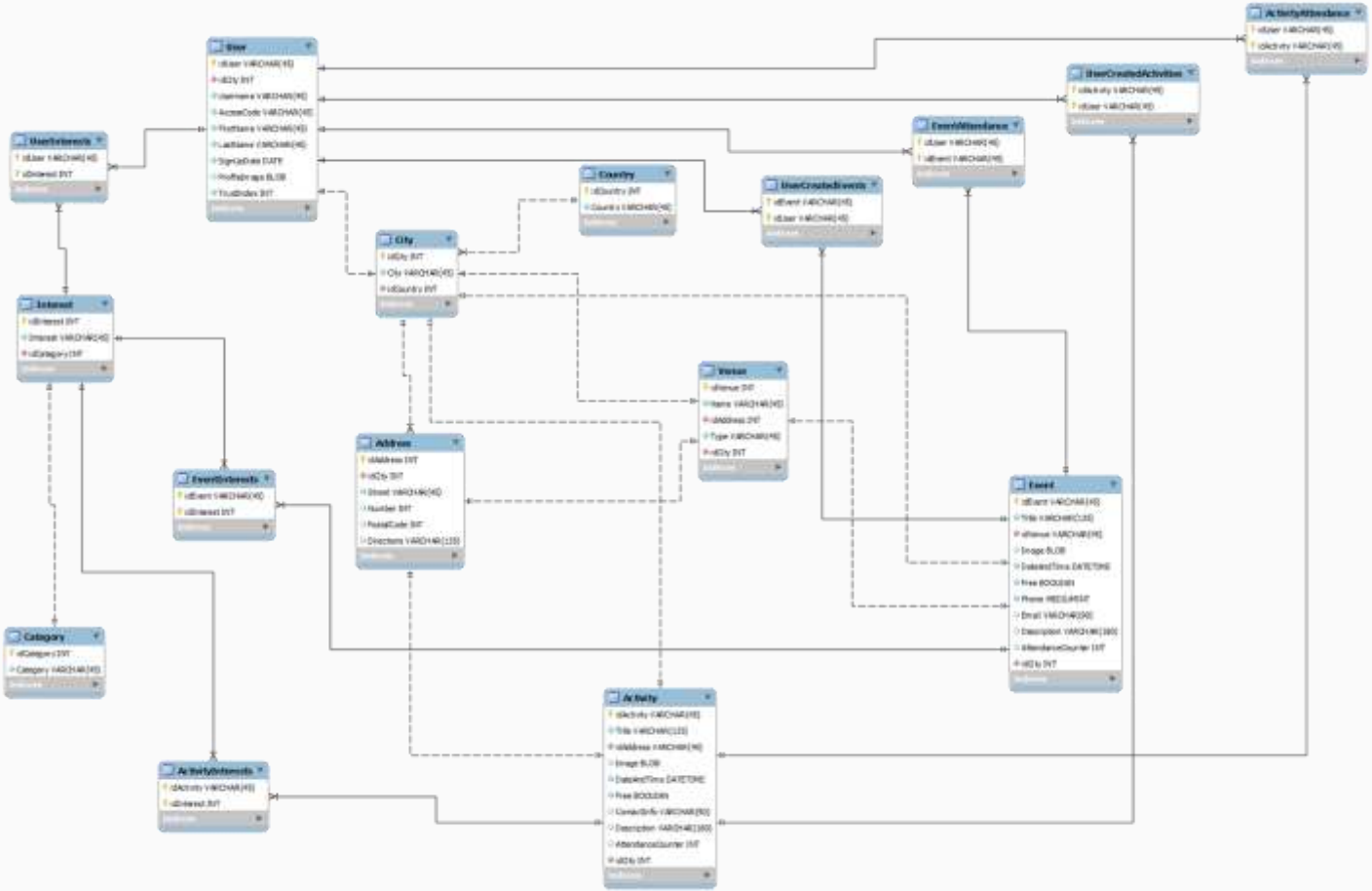
My Journey With Graph



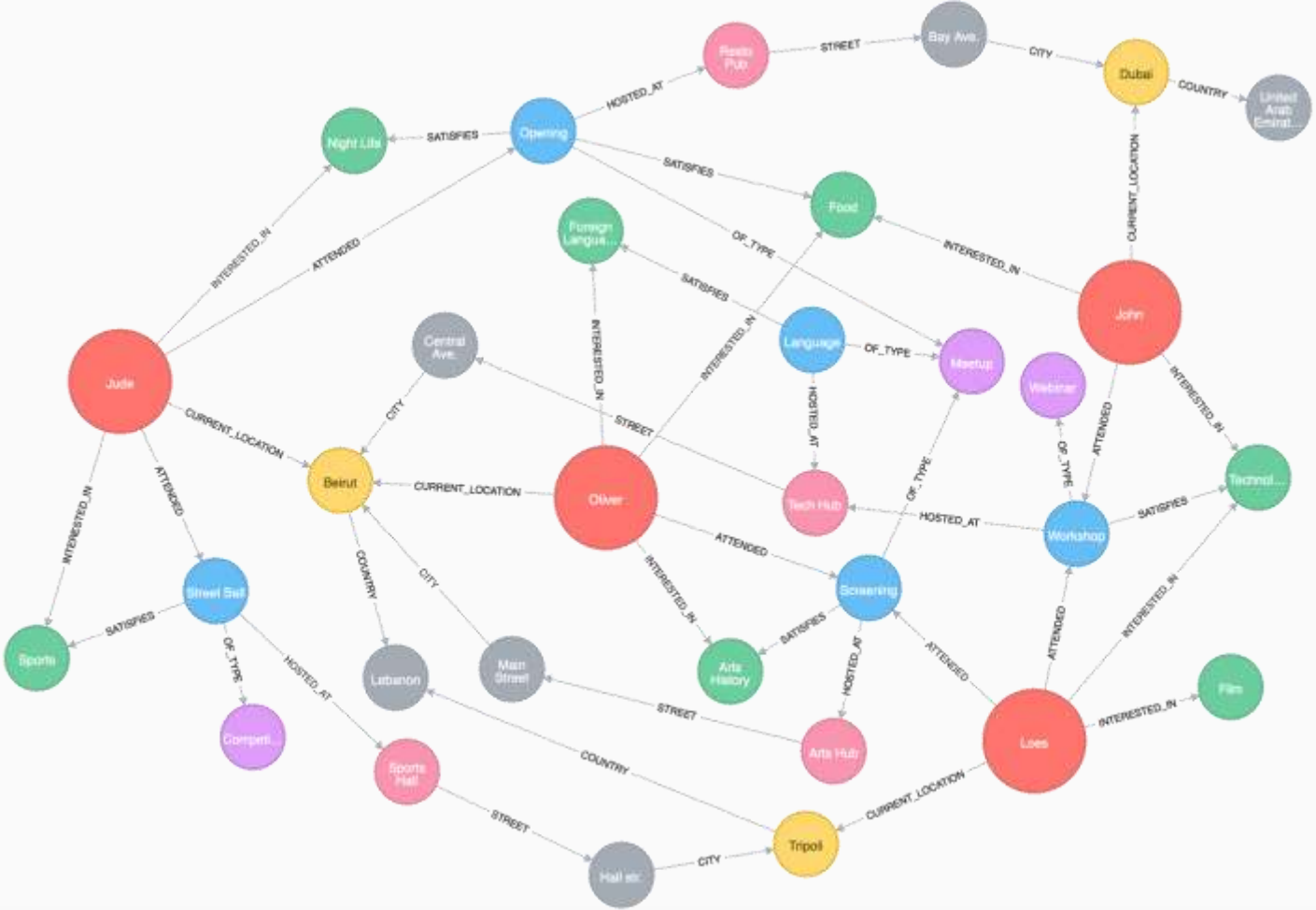
Physical Data Model: Relational



Physical Data Model: 1st Iteration



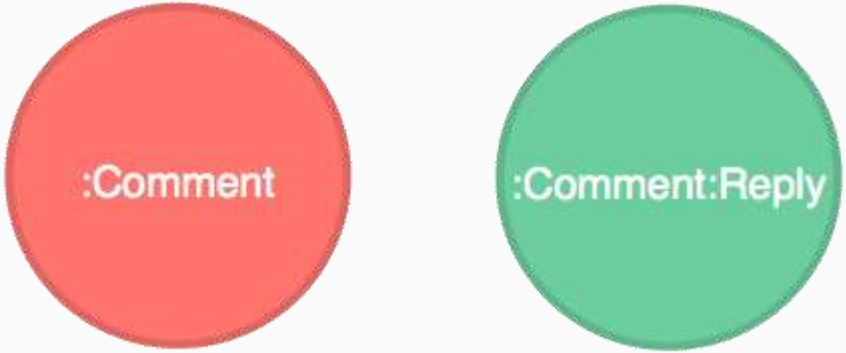
Physical Data Model: 2nd Iteration



Graph Physical Data Model

Best Practices in Data Modeling

:Role:Admin
:Role:Analyst

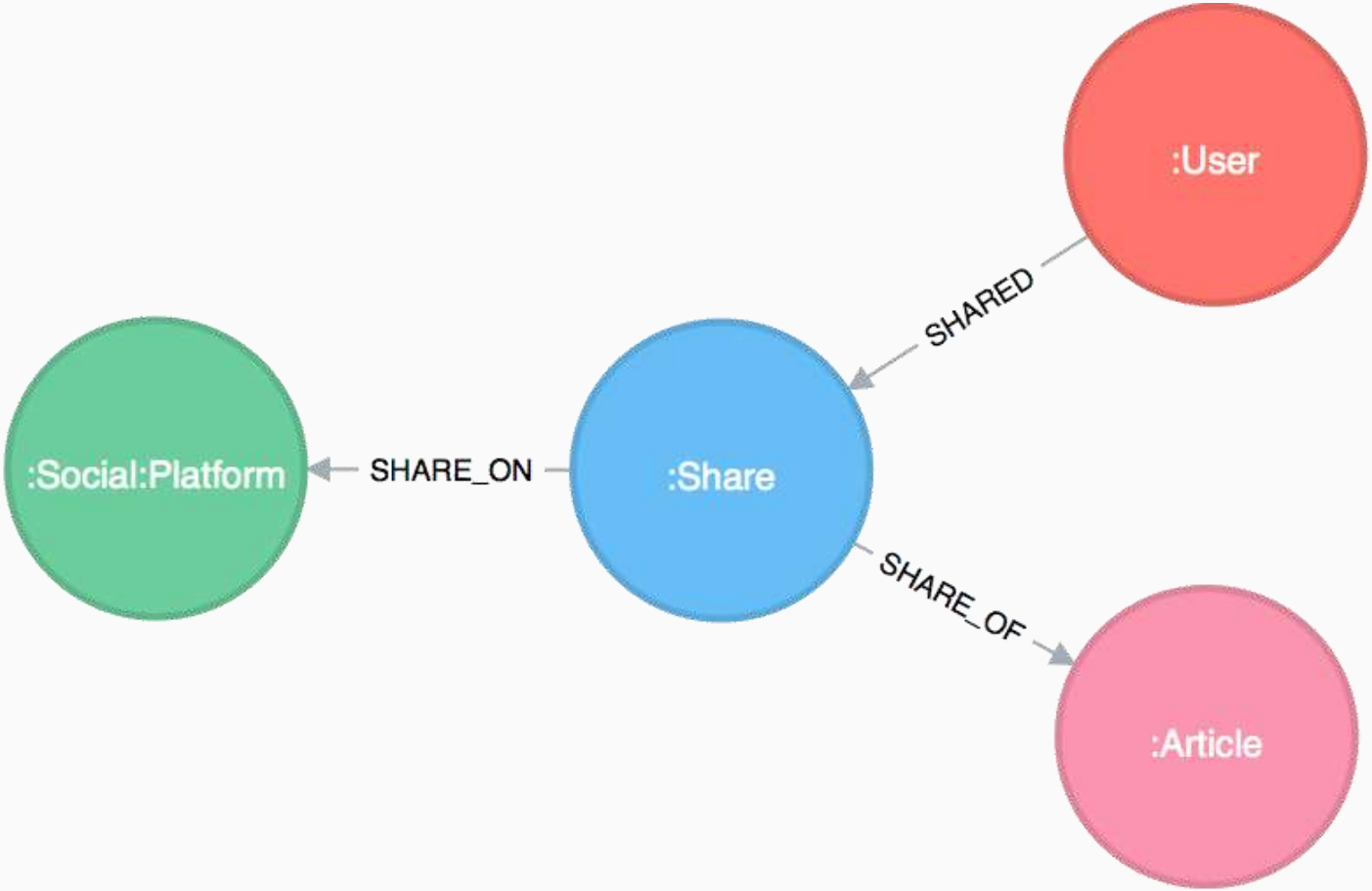


Node Labels

```
()-[:ADDRESS {type:'home'}]->() and ()-[:ADDRESS {type:'delivery'}]->()
```

VS

```
()-[:HOME_ADDRESS]->() and ()-[:DELIVERY_ADDRESS]->()
```


:User
SHARED
:Social:Platform
SHARE_ON
:Share
SHARE_OF
:Article

Fact Nodes

Questions?

Reference

Online Training

Introduction to Graph Databases
Get started with Neo4j – learn about Graph Databases, Neo4j, and Cypher – the Graph Query Language.

Start Now →

Neo4j in Production
Learn about the best practices and deployment implementation for successfully launching Neo4j in a production environment.

Start Now →

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Featuring special guests and Neo4j team members, learn about tip and techniques or discover graph database innovations.

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Neo4j Fundamentals to Graph Data Modeling, get hands-on training and learn from Neo4j experts.

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Request customized Neo4j training for you and your development team at your office.

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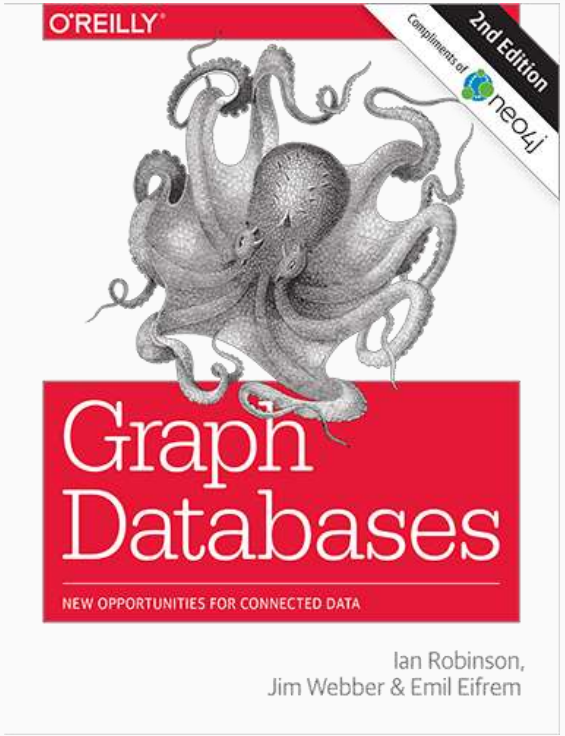
Neo4j Certification Exam

Show your employer, customers and colleagues that you are a Neo4j expert.

University Program

Graph Education for Students and Faculty

Complimentary educational program aimed at helping students and faculty learn and teach about graph databases and Neo4j.



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See you next time,

Cheers!