



## Modelling Social Relationships

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**Amy Sampays**

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# Overview

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OLM Group

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OLM Group

Who are OLM



## Who are OLM

- OLM Systems
- Pavilion
- Hytec



# The Project

- Model complex relationships
- Determine children that could be at risk
- Ask questions
  - What do two people have in common
  - How many degrees of separation are there between two people
  - Is a child at risk
- Minimise interaction between social workers and the DB

====> Graph Database

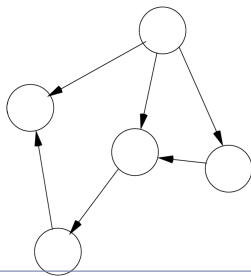
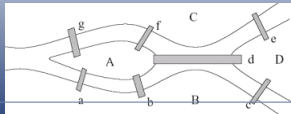


# What is a graph

## Definition

"A graph is a representation of a set of objects where some pairs of objects are connected by links" - *Wikipedia*

- General purpose data structure with well understood patterns and algorithms
- Euler(1701-1783) Seven Bridges





## Who's using them

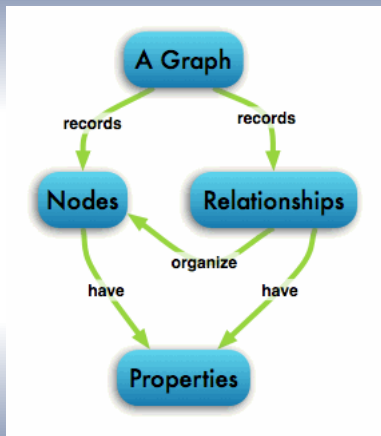
- Facebook
- Twitter
- LinkedIn
- Google
- Ebay





# Neo4j

- Property graph
- Excellent documentation & resources
- Cypher
- Optional plugins/extensions
- Open source







# The Neo4j Browser

The screenshot displays the Neo4j 2.2.2 browser interface. On the left, a sidebar contains navigation and filtering options:

- Node labels:** Address, Child, Crime, DB\_1, DB\_2, DB\_3, DB\_4, Event, Health, Location, Person, ReferenceNode, Test.
- Relationship types:** AFFAIR, CHILD\_MINDER, CONVICTED\_OF, DIAGNOSED\_WITH, DIVORCED, DOCTOR, FATHER, FRIENDS, HAD\_RELATIONSHIP, LAYER, LIVES\_AT, MANAGES, MARRIED\_TO, MOTHER, OFF\_SCHOOL, OWNS, PARTNER, PROSECUTED\_FOR, RTREE\_METADATA.

The main area shows a Cypher query: `$ MATCH (n:DB_2(name:'Ms.Henderson')-[*1..3]-(m) WHERE NOT m.name='Ms.George' OR m...`. Below the query, a summary bar indicates: `(9) Child(3) DB_2(9) Event(1) Location(1) Person(4)`. A second bar shows relationship counts: `(9) MOTHER(2) OFF_SCHOOL(3) OWNS(1) PARTNER(1) SIBLING(1) WORKS_WITH(1)`.

The graph visualization shows nodes as green circles and relationships as arrows. The nodes include Jack, Scott, Ms. Harv, Mr. Harvey, Mr. Erick, Willow Street Guest, Ms. Hen, and Callum. Relationships are labeled with types such as OFF\_SCHOOL, MOTHER, SIBLING, PARTNER, and WORKS\_WITH. The Callum node is highlighted with a yellow border.



## Examples

```
MATCH (node:Person) RETURN node
```

```
MATCH (node:Person) WHERE node.name = "Alice" RETURN node
```

```
MATCH (node1:Person)-[:FRIENDS]->(node2:Person) RETURN  
node1, node2
```



Application

# The Web App





Conclusion

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## Conclusion

