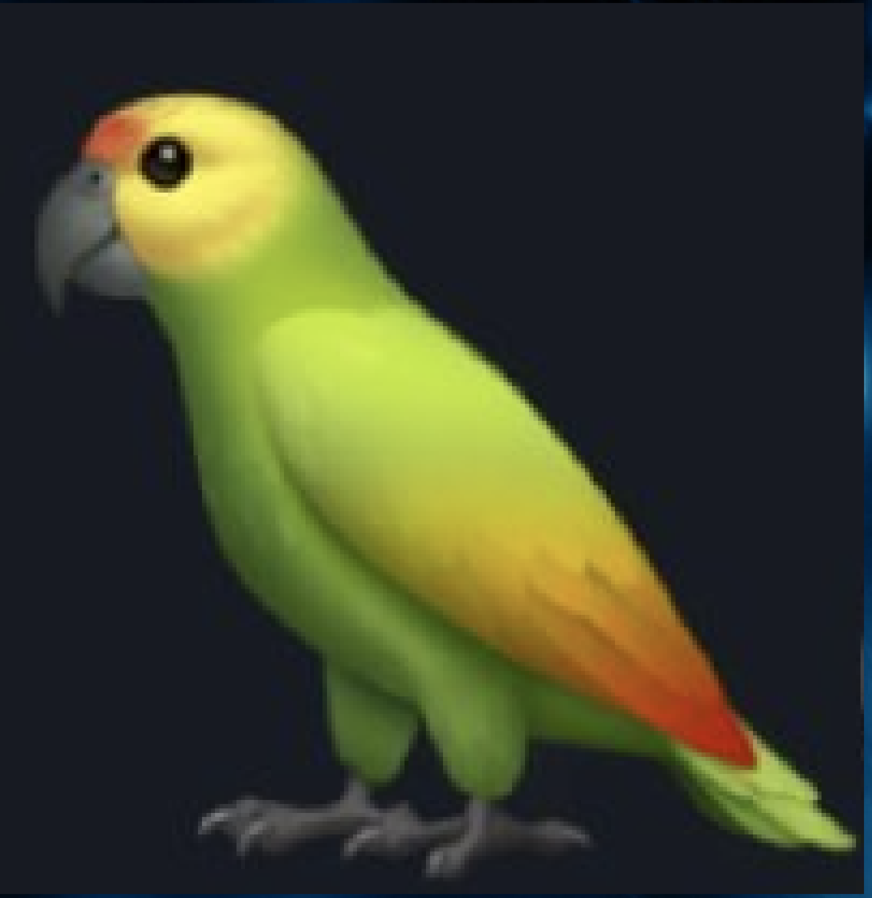
LEVERAGING KNOWLEDGE GRAPH WITH LANGCHAIN & NEO4J



neo4j

PRIMER ON NEO4J & KNOWLEDGE GRAPH @ SPEED OF LIGHT &

CHALLENGE SOLVED: REPRESENTING RELATIONSHIPS

- A GRAPH DESCRIBES THE RELATIONSHIPS IN MORE DETAIL. APART FROM THE NODES EACH RELATIONSHIP CAN HAVE PROPERTIES
- GRAPH MODEL CAN BE MORE NORMALIZED LIKE HOW WE DO IT FOR RDBMS. EACH ITEM IN RDBMS TABLE WILL BE REPRESENTED AS NODE & LABEL. ALSO THERE WILL BE "NO NULL ITEMS"
- THE JOINS WHICH USE FOREIGN KEY TO CONNECT TABLES IS REPLACED WITH RELATIONSHIPS. RELATIONSHIPS HAS DIRECTIONS
- ON TOP OF VISUALIZING NODE PROPERTIES, RELATIONSHIPS PROPERTIES CAN BE VISUALIZED LEADING TO DEEPER INSIGHTS
- PROBLEMS THAT INVOLVE MANY-TO-MANY RELATIONSHIPS WITH HETEROGENEOUS DATA
- CYPHER QUERY LANGUAGE PROVIDES A EFFICIENT INTERFACE TO WORK WITH THE KNOWLEDGE GRAPH
- KNOWLEDGE GRAPH IS AN INTUITIVE WAY OF REPRESENTING NLP DATA. INTEGRATING WITH LANGCHAIN IS POSSIBLE WITH NATIVE CLASSES
- EXTRACTING KNOWLEDGE GRAPH FROM TEXT DATA IS LEVERAGED IN MANY FIELDS RANGING FROM MEDICINE TO RECOMMENDATION

GRAPH DB WHAT IS IT? AN OVERVIEW

NODE : AN ENTITY

LABEL : SET OF NODES

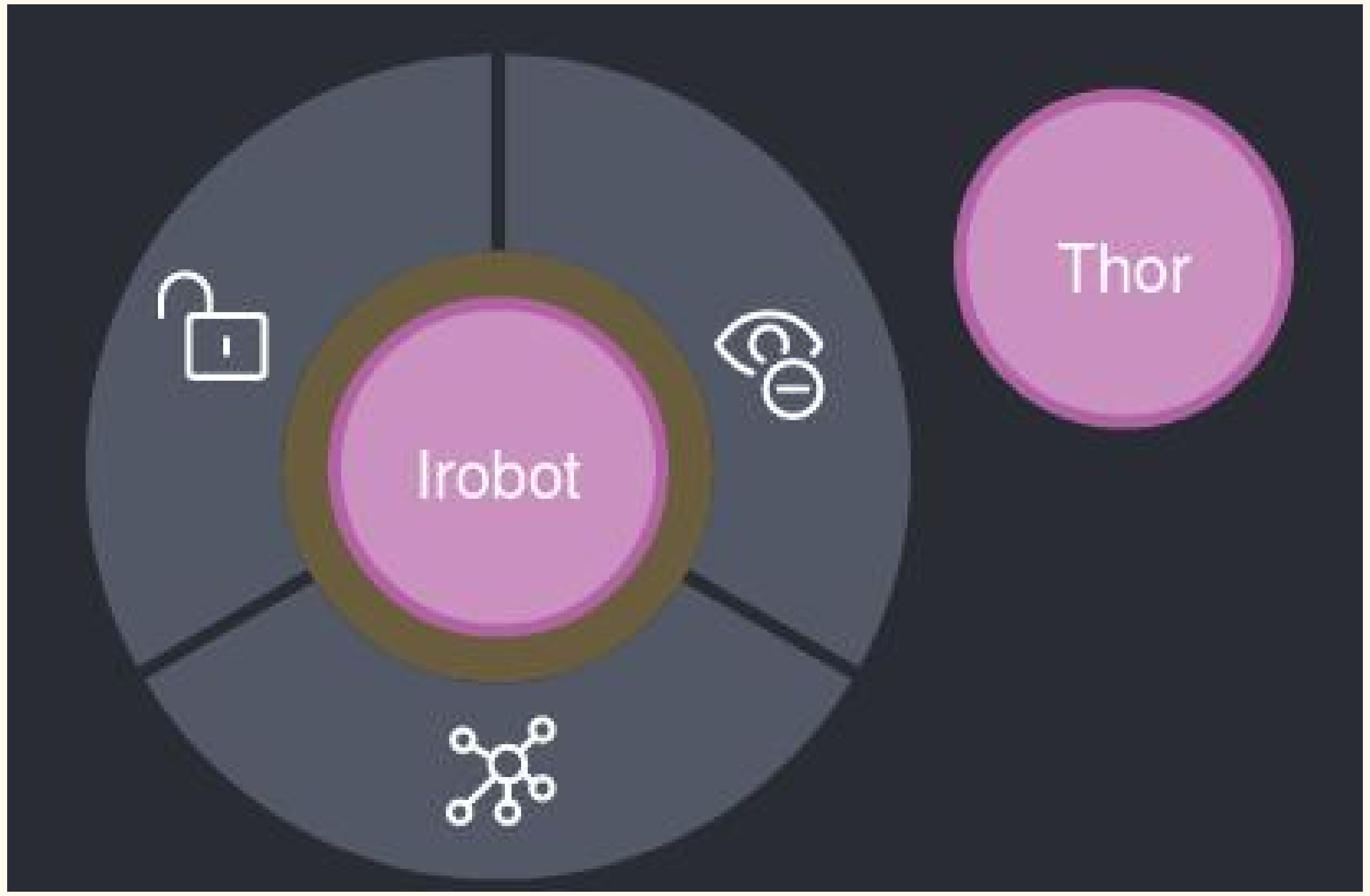
RELATIONSHIP: CONNECTING NODES & DIRECTIONAL

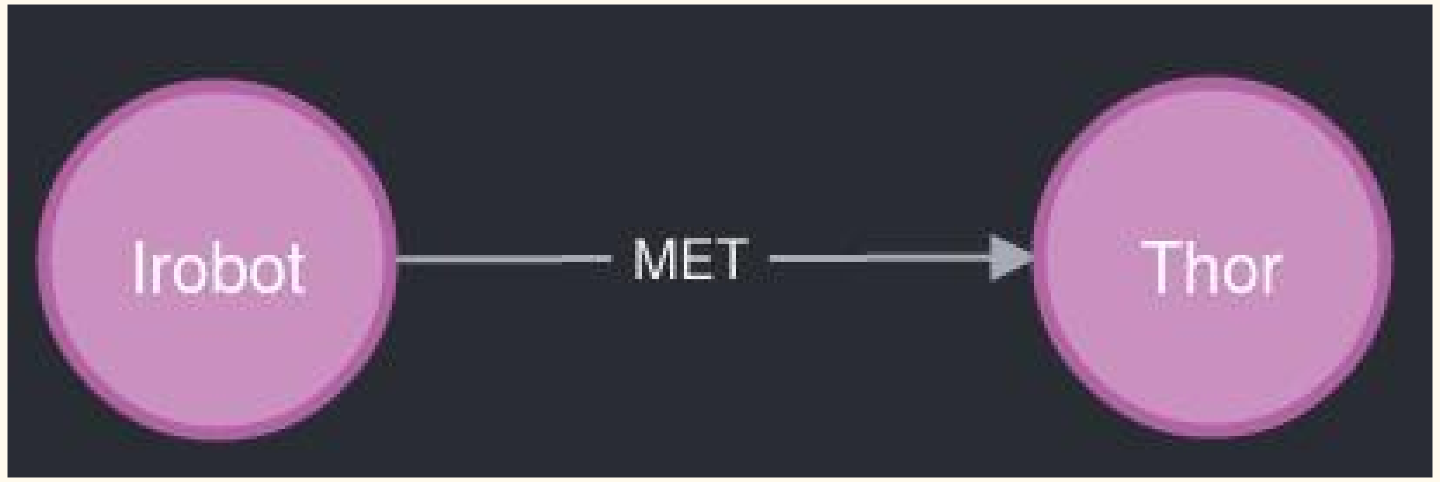
PROPERTIES : VALUES OF VARIOUS FEATURES & NODES

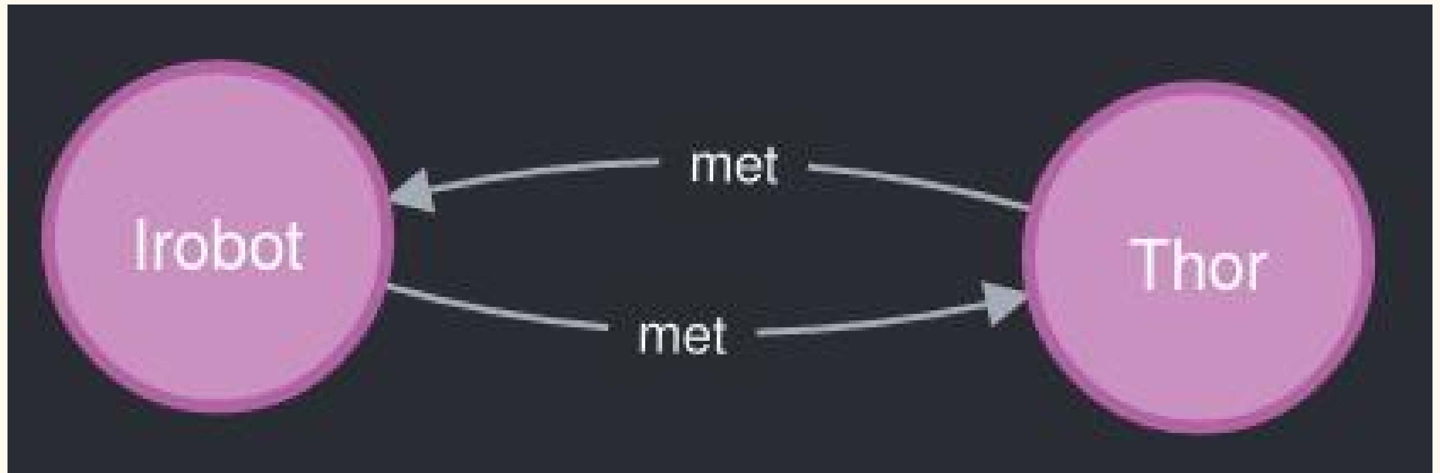
```
{
 "IDENTITY": 0,
 "LABELS": [
   "PERSON"
 ],
 "PROPERTIES": {
   "NAME": "IROBOT",
   "WEIGHT": "HEAVY",
   "LOCATION": "MARS"
 },
 "ELEMENTID": "0"
}
```

MET

```
{
 "IDENTITY": 1,
 "LABELS": [
   "PERSON"
 ],
 "PROPERTIES": {
   "NAME": "THOR",
   "WEIGHT": "SUPER HEAVY",
   "LOCATION": "MOOR"
 },
 "ELEMENTID": "1"
}
```







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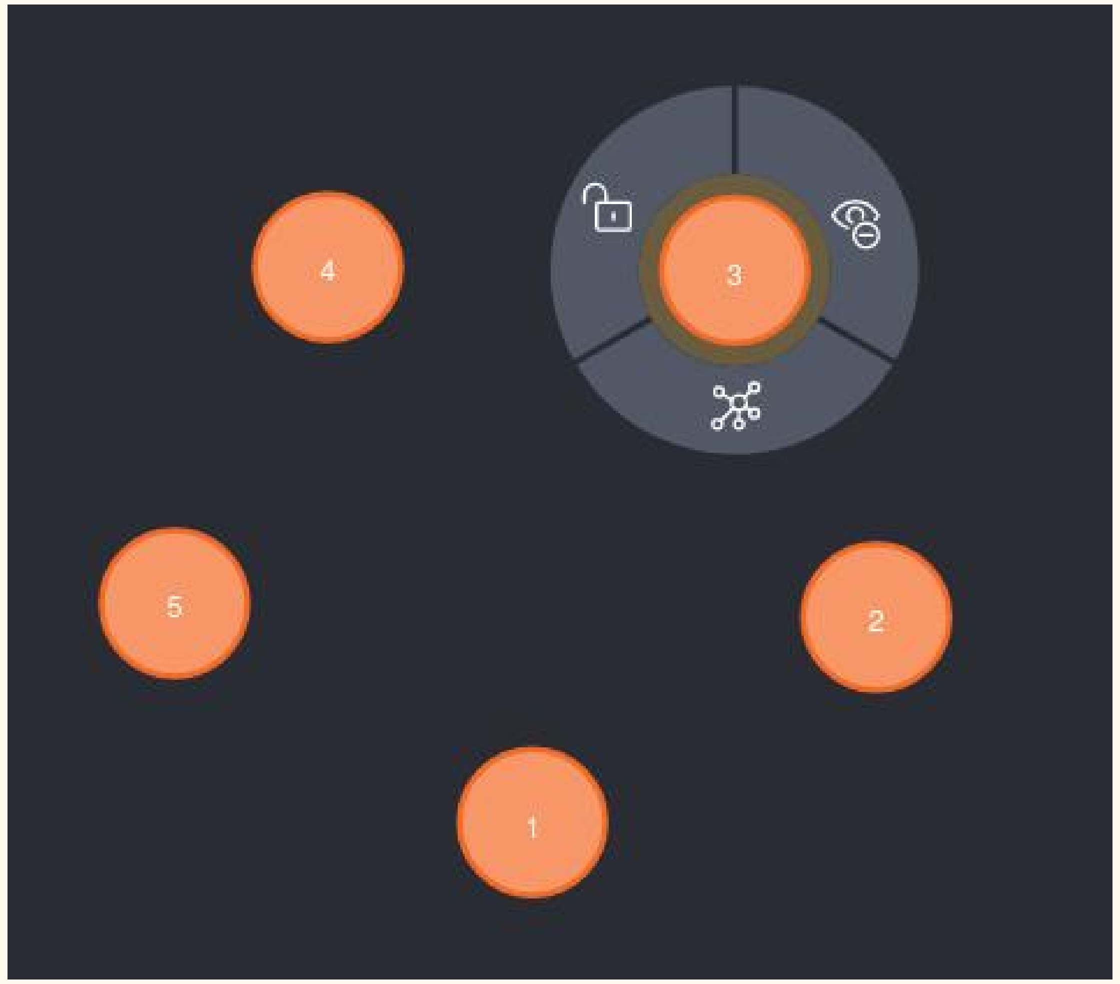
GRAPH DB DATA PROCESSING : DATA LOADING

- "CREATE / MERGE" LABELS, NODES & RELATIONSHIPS
- "MATCH" PATTERN OF NODES & RELATIONSHIPS
- "SET" UPDATES PROPERTIES OF NODES & RELATIONSHIP
- "DELETE" HELPS IN DELETING RELATIONS & NODES
- "MATCH (N) DETACH DELETE N" DELETES ALL NODES & RELATIONS
- "LOAD CSV" IMPORTS THE CSV FILE INTO NEO4J ENVIRONMENT



ID	AUTHOR	FAME_BOOK
1	ISSAC ASIMOV	I-ROBOT
2	DAN BROWN	ANGELS & DEMONS
3	WARREN BUFFETT	SNOW BALL
4	WALTER ISSACSON	DA VINCI
5	ANDREW CARNEGIE	THINK AND GROW RICH

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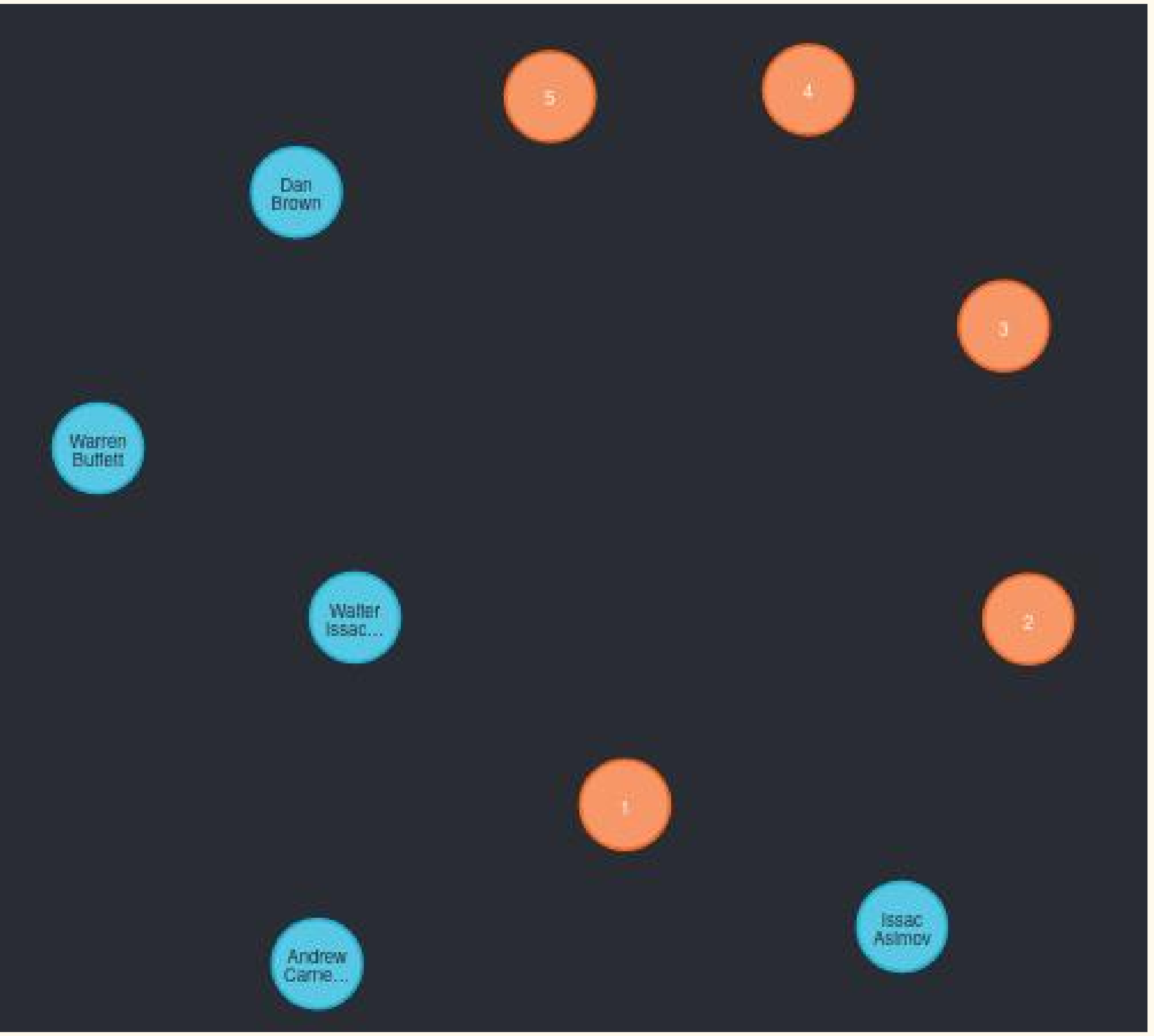
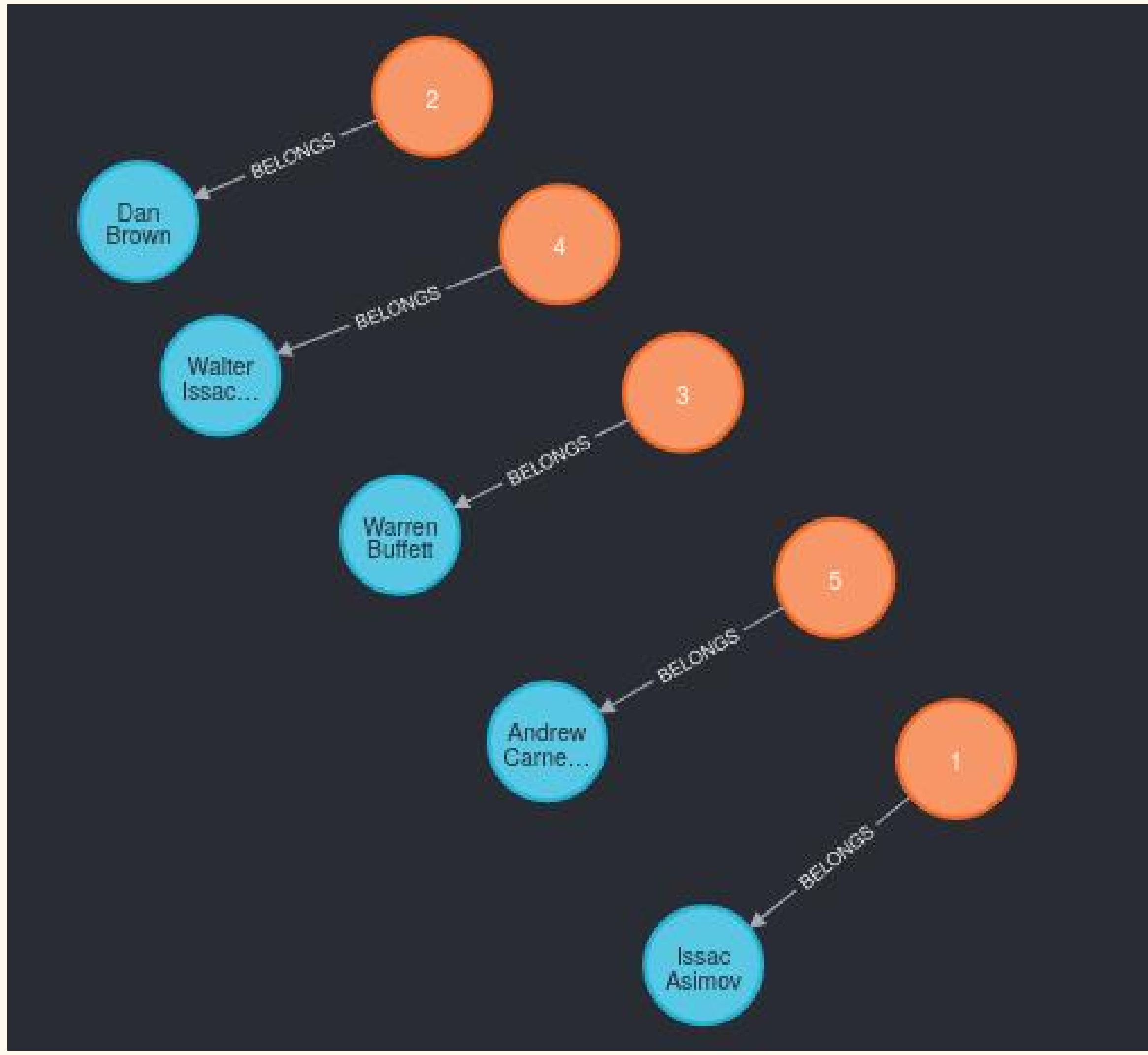
DATA MODELING AND LOADING IN GDB

- DATA MODELING IN GDB IS A ELABORATE TOPIC WHICH WILL BE TAKEN UP LATER
- WE WILL USE 2 SIMPLE TABLES OF NAMES AND PROFESSION TO BUILD A RELATIONSHIP

```
• MATCH (N:JOB {AUTHNAME: N.AUTHNAME})
MATCH (X:AUTHORS {AUTHNAME: N.AUTHNAME})
MERGE (X)-[:BELONGS]->(N)
• MATCH (I:JOB)
MATCH (N:AUTHORS)
RETURN N,I
```



ID	AUTHOR	PROFESSION
1	ISSAC ASIMOV	WRITER
2	DAN BROWN	WRITER
3	WARREN BUFFETT	WRITER
4	WALTER ISSACSON	WRITER
5	ANDREW CARNEGIE	MILLIONAIRE



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LOADING NORTH-WIND & QUERYING WITH LANGCHAIN

- THE TABLE / LABELS TO BE CREATED ARE ORDERS, PRODUCTS, EMPLOYEES, ORDER_DETAILS, CATEGORIES
- WE ARE USING THE TUTORIAL PROVIDED BY NEO4J AND EXTENDING IT TO INCLUDE LANGCHAIN

HTTPS://NEO4J.COM/DEVELOPER/GUIDE-IMPORTING-DATA-AND-ETL/

- LEARN A LOT MORE ABOUT NEO4J AND LANGCHAIN IN A SINGLE VIDEO

HTTPS://PYTHON.LANGCHAIN.COM/DOCS/MODULES/CHAINS/ADDITIONAL/GRAPH_CYPHER_QA

- WE WILL OBSERVE THE LLM (PALM) REQUIRES FEW SHOT EXAMPLE TO CREATE GOOD CYPHERS
- WILL REQUIRE A LOT MORE PRACTICE AND PATIENCE

THANKS FOR WATCHING

REMEMBER TO PRACTICE WITH EXAMPLES

♥ LIKE

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