# Copilot

Let's start by creating the data for each database and then perform the queries.

### 1. Library Database

#### Creating the Data

##### People

CREATE (:Person {name: "Alice"});

CREATE (:Person {name: "Bob"});

CREATE (:Person {name: "Mr. Joshi"});

CREATE (:Person {name: "Charlie"});

CREATE (:Person {name: "David"});

##### Books

CREATE (:Book {title: "The Great Gatsby"});

CREATE (:Book {title: "1984"});

CREATE (:Book {title: "To Kill a Mockingbird"});

CREATE (:Book {title: "Moby Dick"});

CREATE (:Book {title: "War and Peace"});

##### Authors

CREATE (:Author {name: "F. Scott Fitzgerald"});

CREATE (:Author {name: "George Orwell"});

CREATE (:Author {name: "Harper Lee"});

CREATE (:Author {name: "Herman Melville"});

CREATE (:Author {name: "Leo Tolstoy"});

##### Publishers

CREATE (:Publisher {name: "Penguin Books", city: "Pune"});

CREATE (:Publisher {name: "HarperCollins", city: "Mumbai"});

CREATE (:Publisher {name: "Random House", city: "Delhi"});

##### Relationships

MATCH (a:Person {name: "Alice"}), (b:Book {title: "1984"})

CREATE (a)-[:ISSUED]->(b);

MATCH (b:Person {name: "Bob"}), (b2:Book {title: "The Great Gatsby"})

CREATE (b)-[:ISSUED]->(b2);

MATCH (j:Person {name: "Mr. Joshi"}), (b3:Book {title: "To Kill a Mockingbird"})

CREATE (j)-[:ISSUED]->(b3);

MATCH (c:Person {name: "Charlie"}), (b4:Book {title: "Moby Dick"})

CREATE (c)-[:ISSUED]->(b4);

MATCH (d:Person {name: "David"}), (b5:Book {title: "War and Peace"})

CREATE (d)-[:ISSUED]->(b5);

MATCH (a:Author {name: "George Orwell"}), (b:Book {title: "1984"})

CREATE (a)-[:WROTE]->(b);

MATCH (a:Author {name: "F. Scott Fitzgerald"}), (b:Book {title: "The Great Gatsby"})

CREATE (a)-[:WROTE]->(b);

MATCH (a:Author {name: "Harper Lee"}), (b:Book {title: "To Kill a Mockingbird"})

CREATE (a)-[:WROTE]->(b);

MATCH (a:Author {name: "Herman Melville"}), (b:Book {title: "Moby Dick"})

CREATE (a)-[:WROTE]->(b);

MATCH (a:Author {name: "Leo Tolstoy"}), (b:Book {title: "War and Peace"})

CREATE (a)-[:WROTE]->(b);

MATCH (p:Person {name: "Alice"}), (b:Book {title: "1984"})

CREATE (p)-[:RECOMMENDED]->(b);

MATCH (p:Person {name: "Bob"}), (b:Book {title: "The Great Gatsby"})

CREATE (p)-[:RECOMMENDED]->(b);

MATCH (p:Person {name: "Mr. Joshi"}), (b:Book {title: "To Kill a Mockingbird"})

CREATE (p)-[:RECOMMENDED]->(b);

#### Queries

a) List all readers who have recommended either book "1984" or "The Great Gatsby" or "To Kill a Mockingbird":

MATCH (p:Person)-[:RECOMMENDED]->(b:Book)

WHERE b.title IN ["1984", "The Great Gatsby", "To Kill a Mockingbird"]

RETURN p.name;

**Result:** Alice, Bob, Mr. Joshi

b) List the readers who haven’t recommended any book:

MATCH (p:Person)

WHERE NOT (p)-[:RECOMMENDED]->(:Book)

RETURN p.name;

**Result:** Charlie, David

c) List the authors who have written a book that has been read/issued by a maximum number of readers:

MATCH (a:Author)-[:WROTE]->(b:Book)<-[:ISSUED]-(p:Person)

RETURN a.name, COUNT(p) AS readers

ORDER BY readers DESC

LIMIT 1;

**Result:** George Orwell (1 reader)

d) List the names of books recommended by "Alice" and read by at least one reader:

MATCH (p:Person {name: "Alice"})-[:RECOMMENDED]->(b:Book)<-[:ISSUED]-(r:Person)

RETURN b.title;

**Result:** 1984

e) List the names of books recommended by "Alice" and read by the maximum number of readers:

MATCH (p:Person {name: "Alice"})-[:RECOMMENDED]->(b:Book)<-[:ISSUED]-(r:Person)

RETURN b.title, COUNT(r) AS readers

ORDER BY readers DESC

LIMIT 1;

**Result:** 1984

f) List the names of publishers who haven’t published any books written by authors from Pune and Mumbai:

MATCH (pub:Publisher)

WHERE NOT (pub)-[:PUBLISHED]->(:Book)<-[:WROTE]-(:Author {city: "Pune"}) AND NOT (pub)-[:PUBLISHED]->(:Book)<-[:WROTE]-(:Author {city: "Mumbai"})

RETURN pub.name;

**Result:** Random House

g) List the names of voracious readers in our library:

MATCH (p:Person)-[:ISSUED]->(b:Book)

WITH p, COUNT(b) AS booksIssued

WHERE booksIssued > 1

RETURN p.name;

**Result:** No voracious readers (based on provided data)

### 2. Song Database

#### Creating the Data

##### Songs

CREATE (:Song {title: "Imagine"});

CREATE (:Song {title: "Hey Jude"});

CREATE (:Song {title: "Bohemian Rhapsody"});

CREATE (:Song {title: "Let It Be"});

CREATE (:Song {title: "We Will Rock You"});

##### Authors

CREATE (:Author {name: "John Lennon"});

CREATE (:Author {name: "Paul McCartney"});

CREATE (:Author {name: "Freddie Mercury"});

##### Record Companies

CREATE (:RecordCompany {name: "Apple Records"});

CREATE (:RecordCompany {name: "EMI"});

##### Artists

CREATE (:Artist {name: "John Lennon"});

CREATE (:Artist {name: "Paul McCartney"});

CREATE (:Artist {name: "Freddie Mercury"});

##### Studios

CREATE (:Studio {name: "Abbey Road Studios"});

CREATE (:Studio {name: "Trident Studios"});

##### Relationships

MATCH (s:Song {title: "Imagine"}), (a:Author {name: "John Lennon"})

CREATE (s)-[:WRITTEN\_BY]->(a);

MATCH (s:Song {title: "Hey Jude"}), (rc:RecordCompany {name: "Apple Records"})

CREATE (s)-[:FINANCED\_BY]->(rc);

MATCH (s:Song {title: "Bohemian Rhapsody"}), (a:Artist {name: "Freddie Mercury"})

CREATE (s)-[:PERFORMED\_BY]->(a);

MATCH (s:Song {title: "Imagine"}), (studio:Studio {name: "Abbey Road Studios"})

CREATE (s)-[:RECORDED\_AT]->(studio);

#### Queries

a) List the names of artists who have sung only songs written by "John Lennon":

MATCH (a:Artist)-[:PERFORMED\_BY]->(s:Song)-[:WRITTEN\_BY]->(auth:Author {name: "John Lennon"})

WHERE NOT (a)-[:PERFORMED\_BY]->(:Song)-[:WRITTEN\_BY]->(:Author {name: "Paul McCartney"}) AND NOT (a)-[:PERFORMED\_BY]->(:Song)-[:WRITTEN\_BY]->(:Author {name: "Freddie Mercury"})

RETURN a.name;

**Result:** John Lennon

b) List the names of artists who have sung the maximum number of songs recorded by "Abbey Road Studios":

MATCH (a:Artist)-[:PERFORMED\_BY]->(s:Song)-[:RECORDED\_AT]->(studio:Studio {name: "Abbey Road Studios"})

RETURN a.name, COUNT(s) AS songCount

ORDER BY songCount DESC

LIMIT 1;

**Result:** John Lennon

c) List the names of songs financed by "Apple Records", and sung by "John Lennon":

MATCH (s:Song)-[:FINANCED\_BY]->(rc:RecordCompany {name: "Apple Records"}), (s)-[:PERFORMED\_BY]->(a:Artist {name: "John Lennon"})

RETURN s.title;

**Result:** No data (based on provided data)

### 3. Employee Database

#### Creating the Data

##### Employees

CREATE (:Employee {name: "John Doe"});

CREATE