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MongoDB Query Examples

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write mongo db quries with example, write all possible diffrent queries

MongoDB is a NoSQL database that uses JSON-like documents with optional schemas. Here's a comprehensive guide to various MongoDB queries, along with examples for each type.

1. Insert Queries

Insert a Single Document

```javascript
db.collection.insertOne({
    name: "Alice",
    age: 30,
    city: "New York"
});
```

Insert Multiple Documents

```javascript
db.collection.insertMany([
    { name: "Bob", age: 25, city: "Los Angeles" },
    { name: "Charlie", age: 35, city: "Chicago" }
]);
```

2. Find Queries

Find All Documents

```javascript
db.collection.find({});
```

Find Documents with a Condition

```javascript
db.collection.find({ age: { $gt: 30 } });
```

Find with Specific Fields

```javascript
db.collection.find({ age: { $gt: 30 } }, { name: 1, city: 1, _id: 0 });
```

Find One Document

```javascript
db.collection.findOne({ name: "Alice" });
```

3. Update Queries

Update a Single Document

```javascript
db.collection.updateOne(
    { name: "Alice" },
    { $set: { age: 31 } }
);
```

Update Multiple Documents

```javascript
db.collection.updateMany(
    { city: "New York" },
    { $set: { state: "NY" } }
);
```

Replace a Document

```javascript
db.collection.replaceOne(
    { name: "Alice" },
    { name: "Alice", age: 32, city: "New York", profession: "Engineer" }
);
```

4. Delete Queries

Delete a Single Document

```javascript
db.collection.deleteOne({ name: "Alice" });
```

Delete Multiple Documents

```javascript
db.collection.deleteMany({ city: "Chicago" });
```

5. Aggregation Queries

Aggregation Pipeline

```javascript
db.collection.aggregate([
    { $match: { age: { $gt: 25 } } },
    { $group: { _id: "$city", averageAge: { $avg: "$age" } } }
]);
```

6. Indexing Queries

Create an Index

```javascript
db.collection.createIndex({ name: 1 });
```

Find with Index Hint

```javascript
db.collection.find({ name: "Bob" }).hint({ name: 1 });
```

7. Distinct Query

Find Distinct Values

```javascript
db.collection.distinct("city");
```

8. Text Search Queries

Create Text Index

```javascript
db.collection.createIndex({ description: "text" });
```

Text Search

```javascript
db.collection.find({ $text: { $search: "engineer" } });
```

9. Geospatial Queries

Insert Geospatial Data

```javascript
db.collection.insertOne({
    name: "Central Park",
    location: { type: "Point", coordinates: [-73.965355, 40.782865] }
});
```

Find Near a Location

```javascript
db.collection.find({
    location: {
        $near: {
            $geometry: {
                type: "Point",
                coordinates: [-73.935242, 40.730610]
            },
            $maxDistance: 5000
        }
    }
});
```

10. Array Queries

Find Documents with Array Elements

```javascript
db.collection.find({ tags: "mongodb" });
```

Find Documents with All Elements

```javascript
db.collection.find({ tags: { $all: ["mongodb", "database"] } });
```

Update Array Elements

```javascript
db.collection.updateOne(
    { name: "Alice" },
    { $push: { tags: "developer" } }
);
```

11. Advanced Queries

Find with Regular Expression

```javascript
db.collection.find({ name: { $regex: /^A/ } });
```

Conditional Queries

```javascript
db.collection.find({
    $or: [
        { age: { $lt: 25 } },
        { city: "New York" }
    ]
});
```

12. Transactions

Start a Session and Transaction

```javascript
const session = db.getMongo().startSession();
session.startTransaction();

try {
    session.getDatabase("test").collection("users").insertOne({ name: "Dave" }, { s
    session.getDatabase("test").collection("orders").insertOne({ orderId: 123, user

    session.commitTransaction();
} catch (error) {
    session.abortTransaction();
    throw error;
} finally {
    session.endSession();
}
```

These examples cover a wide range of MongoDB operations. They can be adapted and extended to fit various application needs. If you have specific scenarios in mind, feel free to let me know!

compare mondo db quries with sql queries

Comparing MongoDB queries to SQL queries involves understanding the differences between a NoSQL database like MongoDB and a relational database that uses SQL. Below, I'll illustrate various operations in both MongoDB and SQL to highlight these differences.

1. Database and Collection/Table Setup

MongoDB

- **Database**: A logical grouping of collections (like tables).
- **Collection**: A group of documents (like rows).

SQL

- **Database**: A logical grouping of tables.
- **Table**: A group of rows.

2. Insert Data

MongoDB

javascript Copy code

```javascript
db.collection.insertOne({ name: "Alice", age: 30, city: "New York" });

db.collection.insertMany([
    { name: "Bob", age: 25, city: "Los Angeles" },
    { name: "Charlie", age: 35, city: "Chicago" }
]);
```

SQL

sql Copy code

```sql
INSERT INTO users (name, age, city) VALUES ('Alice', 30, 'New York');

INSERT INTO users (name, age, city) VALUES
('Bob', 25, 'Los Angeles'),
('Charlie', 35, 'Chicago');
```

3. Select Data

MongoDB

javascript Copy code

```javascript
// Find all documents
db.collection.find({});

// Find with a condition
db.collection.find({ age: { $gt: 30 } });

// Find specific fields
db.collection.find({ age: { $gt: 30 } }, { name: 1, city: 1, _id: 0 });
```

SQL

sql Copy code

```sql
-- Select all rows
SELECT * FROM users;

-- Select with a condition
SELECT * FROM users WHERE age > 30;

-- Select specific columns
SELECT name, city FROM users WHERE age > 30;
```

4. Update Data

MongoDB

```javascript
// Update a single document
db.collection.updateOne({ name: "Alice" }, { $set: { age: 31 } });

// Update multiple documents
db.collection.updateMany({ city: "New York" }, { $set: { state: "NY" } });
```

SQL

```sql
-- Update a single row
UPDATE users SET age = 31 WHERE name = 'Alice';

-- Update multiple rows
UPDATE users SET state = 'NY' WHERE city = 'New York';
```

5. Delete Data

MongoDB

```javascript
// Delete a single document
db.collection.deleteOne({ name: "Alice" });

// Delete multiple documents
db.collection.deleteMany({ city: "Chicago" });
```

SQL

```sql
-- Delete a single row
DELETE FROM users WHERE name = 'Alice';

-- Delete multiple rows
DELETE FROM users WHERE city = 'Chicago';
```

6. Aggregation

MongoDB

```javascript
db.collection.aggregate([
    { $match: { age: { $gt: 25 } } },
    { $group: { _id: "$city", averageAge: { $avg: "$age" } } }
]);
```

SQL

```sql
SELECT city, AVG(age) as averageAge
FROM users
WHERE age > 25
GROUP BY city;
```

7. Indexes

MongoDB

```javascript
// Create an index
db.collection.createIndex({ name: 1 });

// Use index hint
db.collection.find({ name: "Bob" })[illegible]t({ name: 1 });
```

SQL

```sql
-- Create an index
CREATE INDEX idx_name ON users (name);
```

8. Joins

MongoDB

MongoDB doesn't support joins in the traditional sense but can perform similar operations using aggregation and `` `$lookup` ``.

```javascript
db.orders.aggregate([
    {
        $lookup: {
            from: "users",
            localField: "userId",
            foreignField: "_id",
            as: "userDetails"
        }
    }
]);
```

SQL

```sql
SELECT orders.*, users.*
FROM orders
JOIN users ON orders.userId = users.id;
```

9. Transactions

MongoDB

```javascript
const session = db.getMongo().startSession();
session.startTransaction();
try {
    session.getDatabase("test").collection("users").insertOne({ name: "Dave" }, { s
    session.getDatabase("test").collection("orders").insertOne({ orderId: 123, user

    session.commitTransaction();
} catch (error) {
    session.abortTransaction();
    throw error;
} finally {
    session.endSession();
}
```

SQL

```sql
BEGIN;

INSERT INTO users (name) VALUES ('Dave');
INSERT INTO orders (orderId, user) VALUES (123, 'Dave');

COMMIT;
```

Key Differences

1. **Schema**:
    - **MongoDB**: Schema-less, allowing flexible document structures.
    - **SQL**: Fixed schema, requiring a predefined table structure.
2. **Data Model**:
    - **MongoDB**: Document-oriented, storing data in JSON-like BSON documents.
    - **SQL**: Relational, storing data in tables with rows and columns.
3. **Joins**:

    - **MongoDB**: Limited support via `$lookup` in aggregation.
    - **SQL**: Full join support with `JOIN` operations.
4. **Transactions**:
    - **MongoDB**: Supports ACID transactions in multi-document operations.
    - **SQL**: Traditional ACID transaction support.
5. **Indexing**:
    - Both support indexing, but methods and optimizations differ.
6. **Scalability**:
    - **MongoDB**: Designed for horizontal scaling with sharding.
    - **SQL**: Typically scaled vertically, though some databases support horizontal scaling.

These examples and comparisons illustrate [illegible] MongoDB and SQL handle various database operations differently due to their underlying architectures.

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