MongoDB Indexing and Aggregation Cheat Sheet

1. Indexing in MongoDB

- Create Index: db.users.createIndex({ email: 1 })

- Compound Index: db.orders.createIndex({ customerId: 1, orderDate: -1 })

- Unique Index: db.users.createIndex({ username: 1 }, { unique: true })

- Text Index: db.blogs.createIndex({ title: "text", body: "text" })

- Geospatial Index: db.places.createIndex({ location: "2dsphere" })

- List Indexes: db.users.getIndexes()

- Drop Index: db.users.dropIndex("email_1")

2. Aggregation in MongoDB

Pipeline Stages:

- $match: Filters documents

- $group: Groups and aggregates

- $sort: Sorts the result

- $limit: Limits the output

- $project: Reshapes documents

- $lookup: Joins collections

Example: Top Customers

```
db.orders.aggregate([
  { $match: { status: "paid" } },
  { $group: { _id: "$customerId", totalSpent: { $sum: "$amount" } } },
  { $sort: { totalSpent: -1 } },
  { $limit: 3 }
])
```

Join Example with $lookup:

```
db.orders.aggregate([
```

```
  { $lookup: {

    from: "users",

    localField: "customerId",

    foreignField: "_id",

    as: "customerInfo"

  }},

  { $unwind: "$customerInfo" },

  { $project: { item: 1, "customerInfo.name": 1 } }

])
```

3. Interview Questions

1. What are indexes in MongoDB?

2. What types of indexes exist?

3. How do indexes impact write operations?

4. What is a compound index?

5. What is a sparse index?

6. What is a covered query?

7. How can you check index usage?

8. Explain $lookup and its use.

9. Difference between $group and $project?

10. How do you optimize aggregation pipelines?

11. What is a text index?

12. How does a geospatial index work?

13. Can indexes be created on array fields?

14. What is collation in indexes?

15. How to handle aggregation performance issues?