🟢 Beginner Level (Core MongoDB Basics)

- What is MongoDB
- Collections vs Documents
- Databases & Collections structure
- createCollection
- insertOne / insertMany (array of documents)
- renameCollection
- deleteOne / deleteMany
- find() basics
- query filters ($eq, $ne, $gt, $lt, $in, $nin)
- projection
- sort, skip, limit
- countDocuments()
- distinct
- updateOne / updateMany
- delete field from all documents
- set hire_date to current date
- increase salary by 10% for employees age < 35
- find count of employees age ≥ 20
- basic CRUD operations
- understanding BSON types
- Mongo shell vs Compass vs drivers

🟡 Intermediate Level (Indexes, Modeling & Aggregations)

- data modeling types (embedded vs referenced)
- normalization & denormalization
- drawbacks of normalization
- drawbacks of indexing
- types of indexing
- create index
- clustered index

- clustered collection
- non-clustered index
- wildcard index
- text index
- hashed index
- sparse index
- compound index
- multikey index
- create compound index
- create multikey index
- TTL index
- expireAfterSeconds
- enable journaling
- journaling concept
- covered query
- capped collection
- isCapped
- gridFS (storing large files)
- batch sizing
- create capped collection
- WiredTiger storage engine
- partition tolerance (CAP theorem)
- namespace in MongoDB
- $addToSet
- $inc
- $each
- $set
- $unset
- $rename
- $upsert
- $out

🟠 **Intermediate–Advanced (Aggregation Framework & Query Optimization)**

- aggregation pipeline (concept)
- stages of pipeline
- $match
- $project
- $group
- $sum
- $avg
- $min / $max
- $count
- $sort
- $limit
- $facet
- $addFields
- $set vs $addFields
- $map
- $let
- $cond
- $lookup (joins between collections)
- $reduce
- $merge
- $push / $pull
- $unwind
- $bucket
- $bucketAuto
- $replaceRoot / $replaceWith
- $switch
- $function (custom logic in pipeline)
- $project compound index
- find color-wise average price (aggregation use case)

- orders with exactly two items (aggregation)
- orders with ≥3 total items
- orders delivered 2 days ago
- $bulkwrite
- $addToSet
- $avg vs $sum difference
- find the count / grouping queries
- performance profiling
- database profiler
- explain() plan analysis
- how to improve query performance
- covered query vs non-covered query

🔵 **Advanced (Transactions, Isolation, Sharding & Replication)**

- transaction basics
- ACID properties
- atomicity
- isolation levels
- read/write concerns
- isolation example
- levels in isolation (read uncommitted, committed, repeatable read, serializable)
- enable journaling (durability)
- sharding
- partition key / shard key
- replica set
- replication (primary-secondary setup)
- failover process
- consistency vs availability trade-offs
- CAP theorem in MongoDB context
- clustered collection behavior
- gridFS internals (chunks, metadata)

- profiler configuration
- $merge (used with aggregation)
- $facet for multi-pipeline analysis
- materialized views
- Views vs Materialized Views
- createView
- covered query behavior
- bulk operations (bulkWrite, updateMany)
- batch sizing optimization
- explain("executionStats")

⚫ **Expert (Scaling, Concurrency & Performance Tuning)**

- sharding in depth (balancer, config servers, chunks)
- replica sets internals (oplog, elections)
- journaling internals (WiredTiger journaling, durability guarantees)
- write concern levels (w:1, w:majority)
- read preference & read concern levels
- concurrency control mechanisms (locks, tickets)
- performance optimization (indexes, query tuning, caching)
- profiling tools (db.setProfilingLevel)
- gridFS scaling strategies
- aggregation pipeline optimization (index usage, stage reordering)
- sharded cluster performance
- replication lag monitoring
- transaction rollback handling
- TTL index for automatic data expiry
- monitoring MongoDB performance (mongostat, mongotop)
- backup & restore utilities (mongodump, mongorestore)
- utility commands (dbStats, collStats)
- WiredTiger engine tuning
- CAP theorem applied to MongoDB scaling

- partition tolerance in distributed Mongo setup
- $function in aggregation (server-side scripting)
- explain plans for query optimization
- index cardinality & selectivity optimization
- handling large-scale writes (bulkWrite, batching)
- high concurrency design (connection pooling, batch sizing)