

1 DB Connection Process

How MongoDB connects locally:

1. MongoDB must be installed and the MongoDB server (`mongod`) must be running.
 2. By default, MongoDB runs on: `mongodb://localhost:27017`
 3. When we connect from Node.js, we provide this URL.
 4. The application establishes a TCP connection with the MongoDB server.
 5. If successful, the database becomes accessible for CRUD operations.

What mongoose.connect() does:

- It creates a connection between the Node.js application and MongoDB.
 - It manages connection pooling.
 - It handles authentication (if provided).
 - It prepares the app to use models and schemas.

Why we use `async/await` with `try-catch`:

- Database connection is asynchronous.
 - `async/await` makes the code cleaner and easier to read.
 - `try-catch` handles connection errors properly.
 - Prevents app crash by catching errors.

What happens if DB connection fails:

- The application may crash if error is not handled.
 - CRUD operations will not work.
 - Error message will be shown in console.
 - Server may not start properly.

2 ORM Methods Understanding

`create()` – Inserts a new document (SQL: INSERT)

`find()` - Retrieves documents (SQL: SELECT)

`findById()` - Retrieves one document by ID (SQL: `SELECT WHERE id=...`)

`findByIdAndUpdate()` – Updates document by ID (SQL: UPDATE WHERE id=...)

`findByIdAndDelete()` – Deletes document by ID (SQL: DELETE WHERE id=...)

3 SQL vs MongoDB Mapping

SQL MongoDB

Database Database

Table	Collection
Row	Document
Column	Field
Primary Key	_id

4 Schema Reading Task

Validations Applied:

- name: Required field (must be provided).
- role: Only 'admin' or 'manager' allowed.
- age: Default value is 18 if not provided.

If role is 'user':

- Validation error will occur because it is not in enum list.

If age is not provided:

- Mongoose automatically sets age to 18.

5 Model Understanding Task

Difference between Schema and Model:

- Schema defines structure and validation rules.
- Model is used to interact with the database using that schema.

Why we need model after defining schema:

- Schema only defines structure.
- Model allows performing CRUD operations.

What happens internally when we run mongoose.model():

- Mongoose creates a collection (if not exists).
- It binds schema with the collection.
- Returns a constructor function for documents.