

ASSIGNMENT

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Batch-04

Date:-19-01-2025

1. Implementing CRUD Operations

You implement Create, Read, Update, and Delete operations by calling specific methods on your Sequelize model objects within your controller logic.

- **Create:** Use the `.create()` method to insert a new row into the database.
- **Read:** Use `.findAll()` to retrieve all records or `.findByPk(id)` to find a specific entry by its primary key.
- **Update:** Use the `.update()` method, which requires a `where` clause to specify which record to modify.
- **Delete:** Use the `.destroy()` method with a `where` clause to remove records from the database.

2. Data Validation and Constraints

Sequelize handles data integrity at both the application level and the database level:

- **Model Validation:** These are defined in the model schema (e.g., `isEmail: true, len: [2, 20]`) and are checked before the query is sent to the database.
- **Constraints:** These are database-level rules such as `allowNull: false, unique: true`, or foreign key restrictions that prevent invalid data from being stored.

3. Defining Relationships

Relationships are defined in your model configuration files to link different tables together.

- **One-to-Many:** For a platform where one course has many enrollments, you use `Course.hasMany(Enrollment)` and `Enrollment.belongsTo(Course)`.
- **Many-to-Many:** If a student can join many courses and a course has many students, you use `User.belongsToMany(Course, { through: 'Enrollments' })`.

4. Role of Sequelize Methods

These built-in methods act as an abstraction layer, translating JavaScript code into SQL queries:

Method	Role	SQL Equivalent
<code>create</code>	Inserts a new record.	<code>INSERT INTO</code>

Method	Role	SQL Equivalent
<code>findAll</code>	Retrieves all records.	<code>SELECT *</code>
<code>findById</code>	Retrieves one record by ID.	<code>SELECT ... WHERE id = x</code>
<code>update</code>	Modifies existing records.	<code>UPDATE ... SET</code>
<code>destroy</code>	Removes records.	<code>DELETE FROM</code>

5. Handling Database Errors Gracefully

To prevent your server from crashing during database issues, you should use a structured error-handling approach:

- **Async/Await:** Use `try/catch` blocks or an `asyncHandler` middleware (as seen in your `app.js`) to catch rejected promises.
- **Middleware:** Pass errors to a global `errorHandler` (like the one imported in your `app.js`) to send a clean JSON response back to the client.
- **Specific Errors:** Check for specific Sequelize error types, such as `SequelizeValidationError` or `SequelizeUniqueConstraintError`, to provide helpful feedback to the user.

Images

```

{
  "name": "20260119",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "type": "commonjs",
  "dependencies": {
    "express": "^5.2.1",
    "react": "^19.2.3"
  },
  "devDependencies": {
    "nodemon": "^3.1.11"
  }
}

PS D:\FULLSTACK 2026\20260119>
  
```

```
C:\Users\91939\OneDrive\Desktop\Fullstack2026>npm init express
Need to install the following packages:
create-express@1.0.4
Ok to proceed? (y) y

npm warn deprecated source-map-url@0.4.1: See https://github.com/lydell/source-map-url#deprecated
npm warn deprecated urix@0.1.0: Please see https://github.com/lydell/urix#deprecated
npm warn deprecated resolve-url@0.2.1: https://github.com/lydell/resolve-url#deprecated
npm warn deprecated source-map-resolve@0.5.3: See https://github.com/lydell/source-map-resolve#deprecated
npm warn deprecated inflight@1.0.6: This module is not supported, and leaks memory. Do not use it. Check out lru-cache if you want a good and tested way to coalesce async requests by a key value, which is much more comprehensive and powerful.
npm warn deprecated formidable@1.2.6: Please upgrade to latest, formidable@v2 or formidable@v3! Check these notes: https://bit.ly/2ZEqIau
npm warn deprecated babel-preset-es2015@6.24.1: 🎉 Thanks for using Babel: we recommend using babel-preset-env now: please read https://babeljs.io/env to update!
npm warn deprecated glob@7.2.3: Glob versions prior to v9 are no longer supported
npm warn deprecated superagent@2.3.0: Please upgrade to superagent v10.2.2+, see release notes at https://github.com/forwardemail/superagent/releases/tag/v10.2.2 - maintenance is supported by Forward Email @ https://forwardemail.net
npm warn deprecated core-js@2.6.12: core-js@<3.23.3 is no longer maintained and not recommended for usage due to the number of issues. Because of the V8 engine whims, feature detection in old core-js versions could cause a slowdown up to 100x even if nothing is polyfilled. Some versions have web compatibility issues. Please, upgrade your dependencies to the actual version of core-js.

> fullstack2026@1.0.0 npx
> create-express
```

```
C:\Users\91939\OneDrive\Desktop\Fullstack2026>
Ln 1 Col 1 Spaces: 2 HTD
> fullstack2026@1.0.0 npx
> create-express
```

```
C:\Users\91939\OneDrive\Desktop\Fullstack2026>npm install express
added 65 packages, and audited 66 packages in 4s

22 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
```

```
C:\Users\91939\OneDrive\Desktop\Fullstack2026>
run npm fund for details
found 0 vulnerabilities
C:\Users\91939\OneDrive\Desktop\Fullstack2026>npm i -D nodemon
added 27 packages, and audited 93 packages in 2s

26 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
C:\Users\91939\OneDrive\Desktop\Fullstack2026>
```

```
PS D:\FULLSTACK 2026\20260119 > {
>>   "name": "John",
>>   "email": "john@gmail.com"
>> }
```

The screenshot shows two instances of the Visual Studio Code (VS Code) interface. Both instances have the same workspace open, featuring a terminal window at the top, followed by tabs for 'package.json', '.env', and 'package-lock.json'. Below these are sections for 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', and 'TERMINAL'. The 'TERMINAL' section displays command-line history and code snippets.

Top Instance Terminal Output:

```
PS D:\FULLSTACK 2026\20260119> Set-ExecutionPolicy RemoteSigned -Scope CurrentUser
PS D:\FULLSTACK 2026\20260119> npm init -y
Write to D:\FULLSTACK 2026\20260119\package.json:
```

Top Instance Code Editor (package.json):

```
{
  "name": "20260119",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" & exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "type": "commonjs",
  "dependencies": {
    "express": "^5.2.1",
    "react": "^19.2.3"
  },
  "devDependencies": {
    "node-sass": "^3.1.11"
  }
}
```

Bottom Instance Explorer View:

The Explorer view shows the file system structure of the workspace. It includes a tree view of '20260119', 'node_modules', '.env', and 'package-lock.json'. The 'package-lock.json' file is selected, indicating it is the active file in the editor.

Bottom Instance Code Editor (package-lock.json):

```
{
  "name": "20260119",
  "version": "1.0.0",
  "license": "ISC",
  "dependencies": {
    "express": "^5.2.1",
    "react": "^19.2.3"
  },
  "devDependencies": {
    "node-sass": "^3.1.11"
  }
}

"node_modules/accepts": {
  "version": "1.0.0",
  "resolved": "https://registry.npmjs.org/accepts/-/accepts-1.0.0.tgz",
  "integrity": "sha512-XScyGCTsarfqWQ1Mf1xxc3Q1akRgQ1+2n/6ao+67gu/RCuBhlfGzh8841z5uTlg2YugFq50ImNkrg==",
  "license": "MIT",
  "dependencies": [
    "mime-types": "^3.0.0",
    "negotiator": "^1.0.0"
  ],
  "engines": {
    "node": ">= 0.6"
  }
}

"node_modules/anymatch": {
  "version": "3.1.3",
  "resolved": "https://registry.npmjs.org/anymatch/-/anymatch-3.1.3.tgz",
  "integrity": "sha512-KHRefUn84t+0+OBj3SK7qvoc2xAS05SUcBongKdSkob-MdywV7h/zsdBmVseacJutxiqVrjIw==",
  "license": "ISC",
  "dependencies": [
    "normalize-path": "^3.0.0",
    "picomatch": "^2.0.4"
  ],
  "engines": {
    "node": ">= 8"
  }
}

"node_modules/balanced-match": {
  "version": "1.0.2",
  "resolved": "https://registry.npmjs.org/balanced-match/-/balanced-match-1.0.2.tgz",
  "integrity": "sha512-3Se00TM67HtIAmXcbyaqJTJHx07Q940v9cX4AbDaxA8enXrtJ0peplkwqW11ElmY5Pw==",
  "dev": true,
  "license": "MIT"
}

"node_modules/binary-extensions": {
  "version": "2.3.0",
  "resolved": "https://registry.npmjs.org/binary-extensions/-/binary-extensions-2.3.0.tgz",
  "integrity": "sha512-3Se00TM67HtIAmXcbyaqJTJHx07Q940v9cX4AbDaxA8enXrtJ0peplkwqW11ElmY5Pw=="
}
```

The screenshot shows the VS Code interface with the package.json file open in the center. The code editor displays the following JSON content:

```
1 {  
2   "name": "20260119",  
3   "version": "1.0.0",  
4   "description": "",  
5   "main": "index.js",  
6   "scripts": {  
7     "test": "echo \\\"Error: no test specified\\\" & exit 1"  
8   },  
9   "keywords": [],  
10  "author": "",  
11  "license": "ISC",  
12  "type": "commonjs",  
13  "dependencies": {  
14    "express": "^5.2.1",  
15    "react": "^19.2.3"  
16  },  
17  "devDependencies": {  
18    "nodemon": "^3.1.11"  
19  }  
21 }
```

The sidebar on the left shows the project structure with files like .env and package-lock.json. A floating panel on the right titled "Ask about your code" provides AI assistance.

The screenshot shows the VS Code interface with the package.json file open in the center. The code editor displays the same JSON content as the first screenshot. Below the editor, the terminal tab shows the following command history:

```
PS D:\FULLSTACK 2026\20260119> Set-ExecutionPolicy RemoteSigned -Scope CurrentUser  
PS D:\FULLSTACK 2026\20260119> npm init -y  
Wrote to D:\FULLSTACK 2026\20260119\package.json:  
{  
  "name": "20260119",  
  "version": "1.0.0",  
  "description": "",  
  "main": "index.js",  
  "scripts": {  
    "test": "echo \\\"Error: no test specified\\\" & exit 1"  
  },  
  "keywords": [],  
  "author": "",  
  "license": "ISC",  
  "type": "commonjs",  
  "dependencies": {  
    "express": "^5.2.1",  
    "react": "^19.2.3"  
  },  
  "devDependencies": {  
    "nodemon": "^3.1.11"  
  }  
}  
% PS D:\FULLSTACK 2026\20260119>
```

The terminal also shows the system tray with weather information (31°C, Sunny) and system status icons.

The screenshot shows two instances of the Visual Studio Code (VS Code) interface side-by-side. Both instances have the same workspace open, featuring a dark theme.

Top Window (Left):

- Explorer:** Shows a folder named "20260119" containing "node_modules", ".env", ".se", "package-lock.json", and "package.json".
- Editor:** The "package-lock.json" tab is active, displaying a large JSON object representing the dependency tree. The JSON includes fields like "name", "version", "description", "main", "scripts", "keywords", "author", "license", and "type". It also lists dependencies for "express", "react", "node-fetch", "socket.io", "express-validator", "mimic-response", "negotiator", "engines", and "node-modules/anymatch".
- Terminal:** Shows the command "Q 20260119".
- Status Bar:** Shows "Trending videos" and "Avengers: Doom...".

Bottom Window (Right):

- Explorer:** Shows a folder named "20260119" containing "node_modules", ".env", ".se", "package-lock.json", and "package.json".
- Editor:** The "package.json" tab is active, displaying the configuration file. The JSON includes fields like "name", "version", "description", "main", "scripts", "keywords", "author", "license", and "type".
- Terminal:** Shows the command "Q 20260119".
- Status Bar:** Shows "ENG IN" and the date "19-01-2026".

The screenshot shows the Visual Studio Code (VS Code) interface with a dark theme. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, Help, and a search bar. The left sidebar has sections for Explorer, Outline, and Timeline. The main editor area displays the contents of a package.json file:

```
1 {
2   "name": "20260119",
3   "version": "1.0.0",
4   "description": "",
5   "main": "index.js",
6   "scripts": {
7     "test": "echo \"Error: no test specified\" && exit 1"
8   },
9   "keywords": [],
10  "author": "",
11  "license": "ISC",
12  "type": "commonjs",
13  "dependencies": {
14    "express": "^5.2.1",
15    "react": "^19.2.3"
16  },
17  "devDependencies": [
18    "node-demon": "^3.1.11"
19  ]
20}
```

The right side of the interface features the AI Assistant panel, which includes a 'CHAT' tab, a message input field, and a 'Ask about your code' section. It also displays a snippet of code from package.json and provides instructions for generating agent instructions.