ASSIGNMENT

Name: T.SaiThrishool Roll Number: 2303A51127

Batch-03 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
create	Inserts a new record.	INSERT INTO

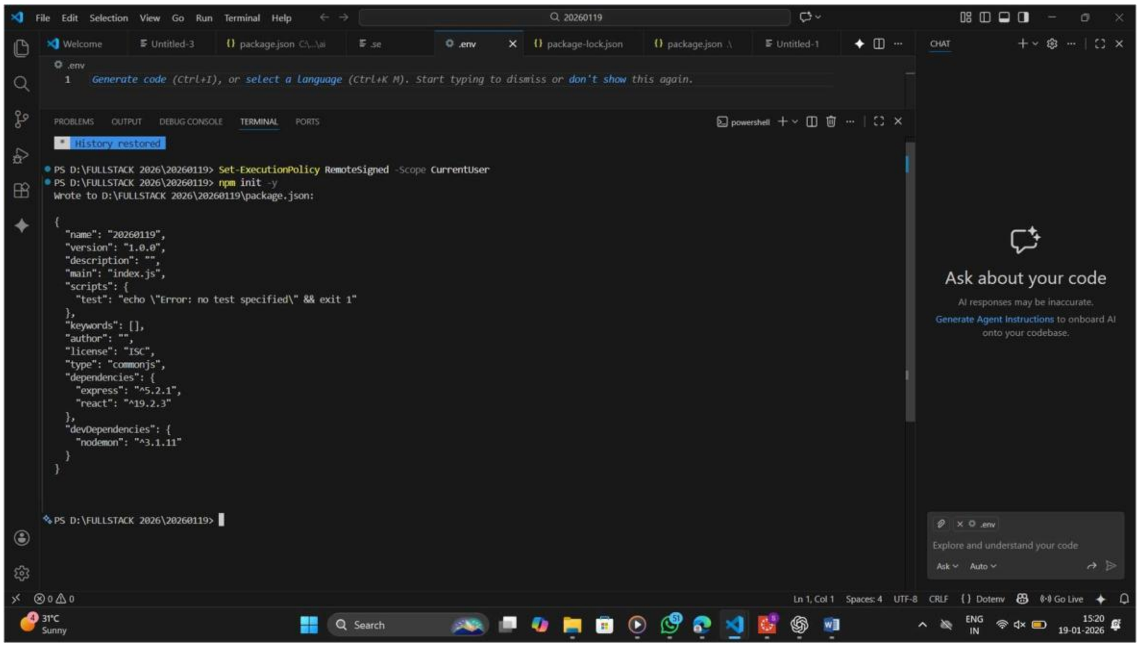
Method	Role	SQL Equivalent
findAll	Retrieves all records	SELECT *
findByPk	Retrieves one record	SELECT ... WHERE id = x
update	Modifies existing rec	UPDATE ... SET
destroy	Removes records.	DELETE FROM

5. Handling Database Errors Gracefully

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

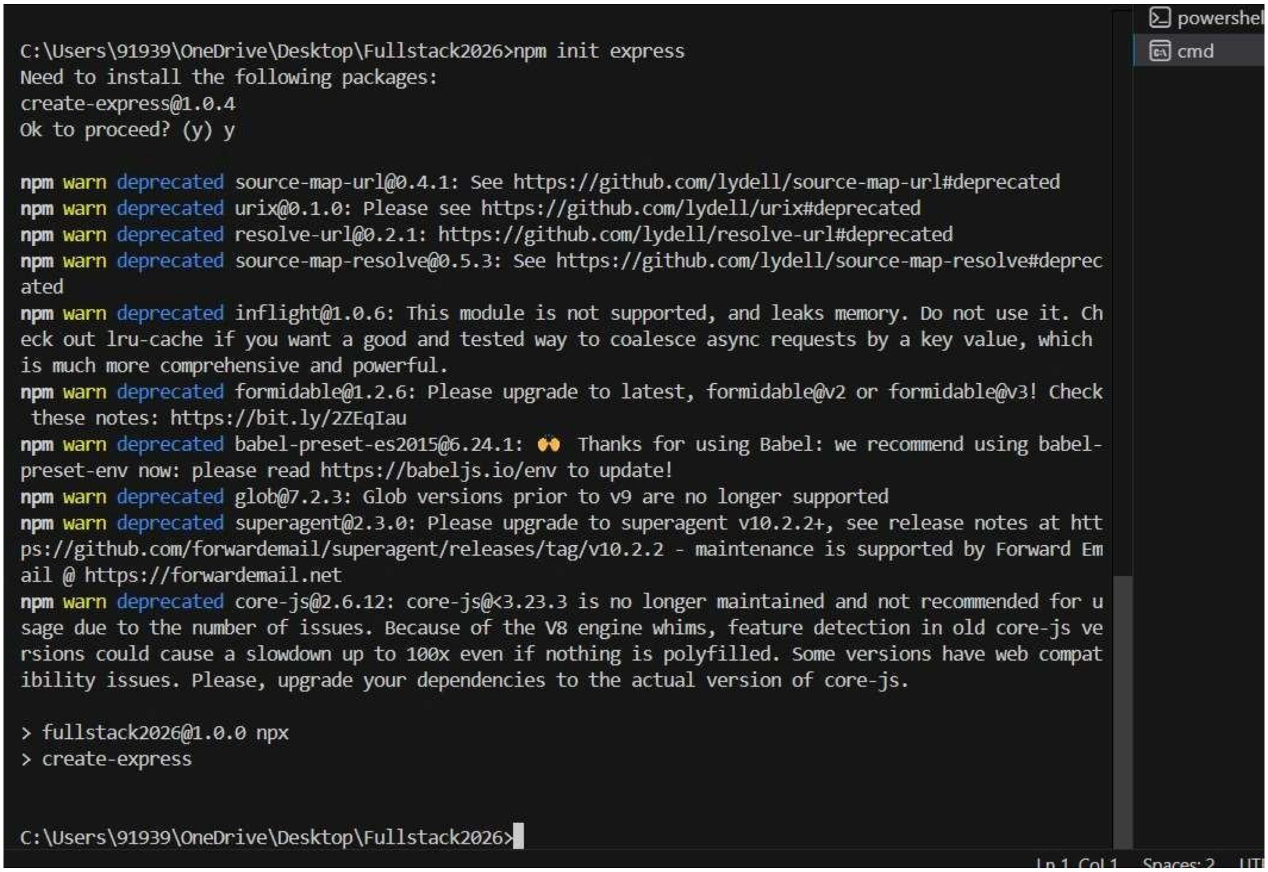
- Async/Await: Use try/catch blocks or an asyncHandler middleware (as seen in your app.js) to catch rejected promises.
- Middleware: Pass errors to a global errorHandler (like the one imported in your app.js) to send a clean JSON response back to the client.
- Specific Errors: Check for specific Sequelize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

Images

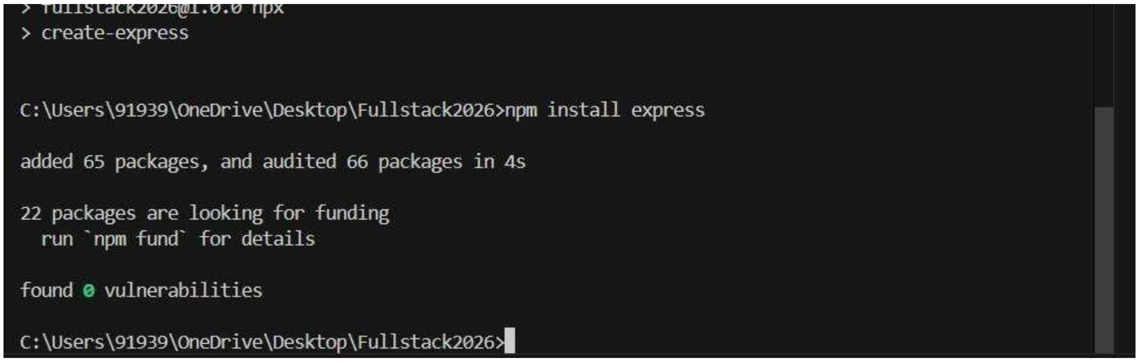


```
.env
1   Generate code (Ctrl+I), or select a language (Ctrl+K M). Start typing to dismiss or don't show this again.
```

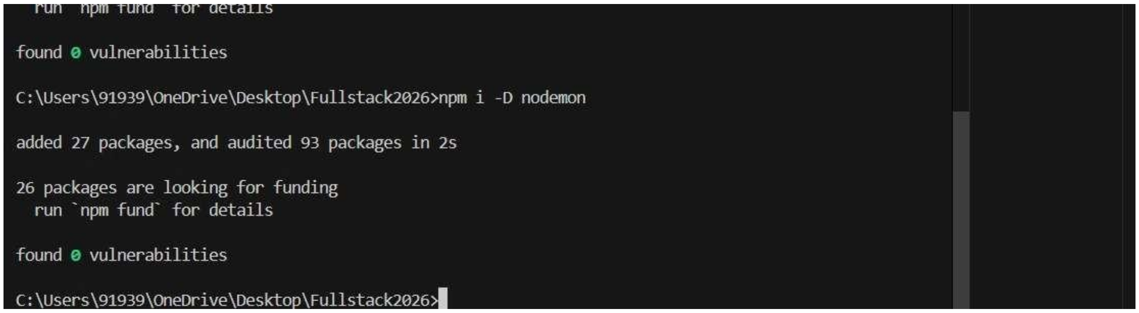
```
* History restored

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> 
```



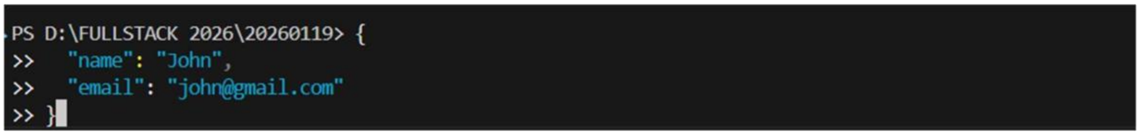
```
C:\Users\91939\OneDrive\Desktop\Fullstack2026>npm init express
Need to install the following packages:
create-express@1.0.4
Ok to proceed? (y) y

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#deprec
ated
npm warn deprecated inflight@1.0.6: This module is not supported, and leaks memory. Do not use it. Ch
eck 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 htt
ps://github.com/forwardemail/superagent/releases/tag/v10.2.2 - maintenance is supported by Forward Em
ail @ https://forwardemail.net
npm warn deprecated core-js@2.6.12: core-js@<3.23.3 is no longer maintained and not recommended for u
sage due to the number of issues. Because of the V8 engine whims, feature detection in old core-js ve
rsions could cause a slowdown up to 100x even if nothing is polyfilled. Some versions have web compat
ibility 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>
```



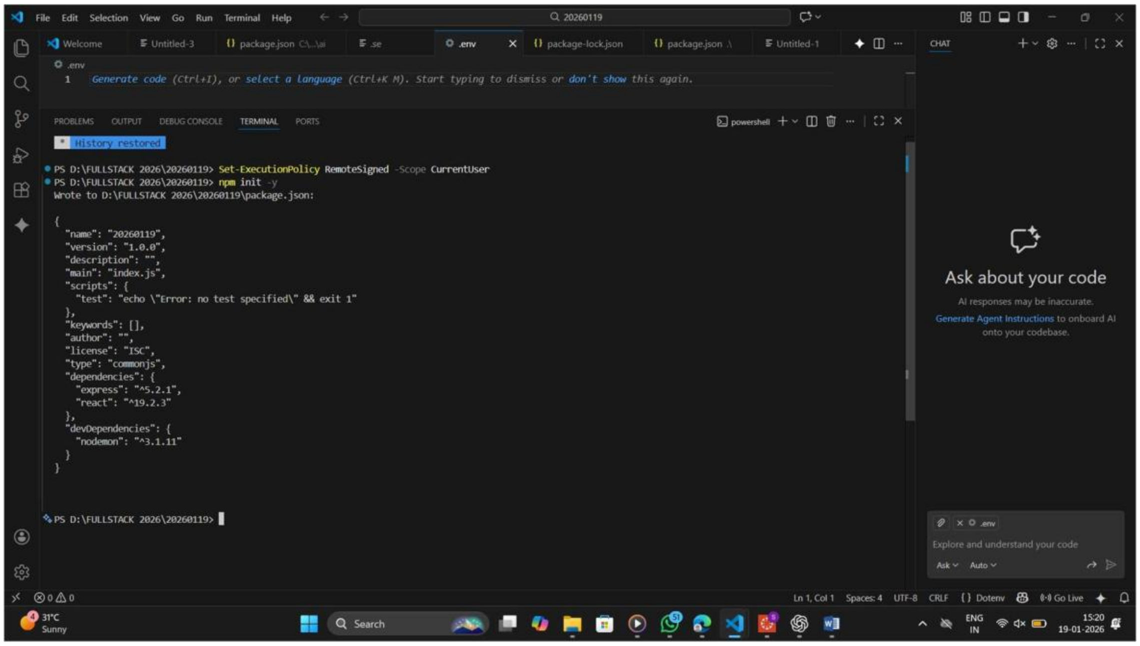
```
> fullstack2026@1.0.0 npx
> create-express


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>
```

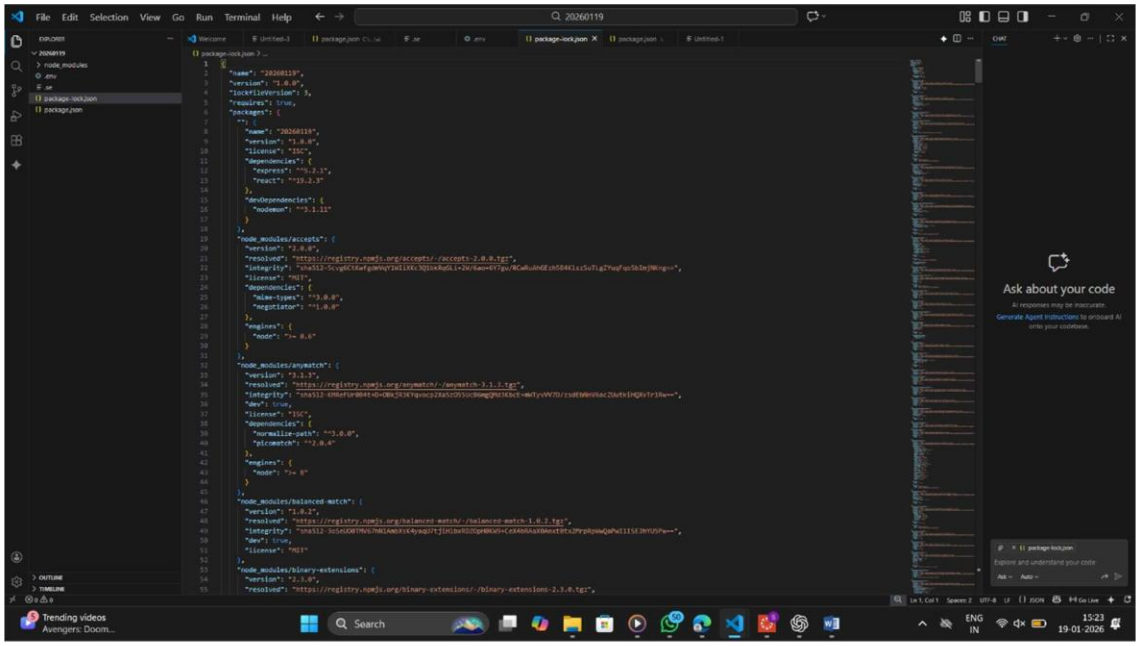


```
PS D:\FULLSTACK 2026\20260119> {
>>   "name": "John",
>>   "email": "john@gmail.com"
>> }
```

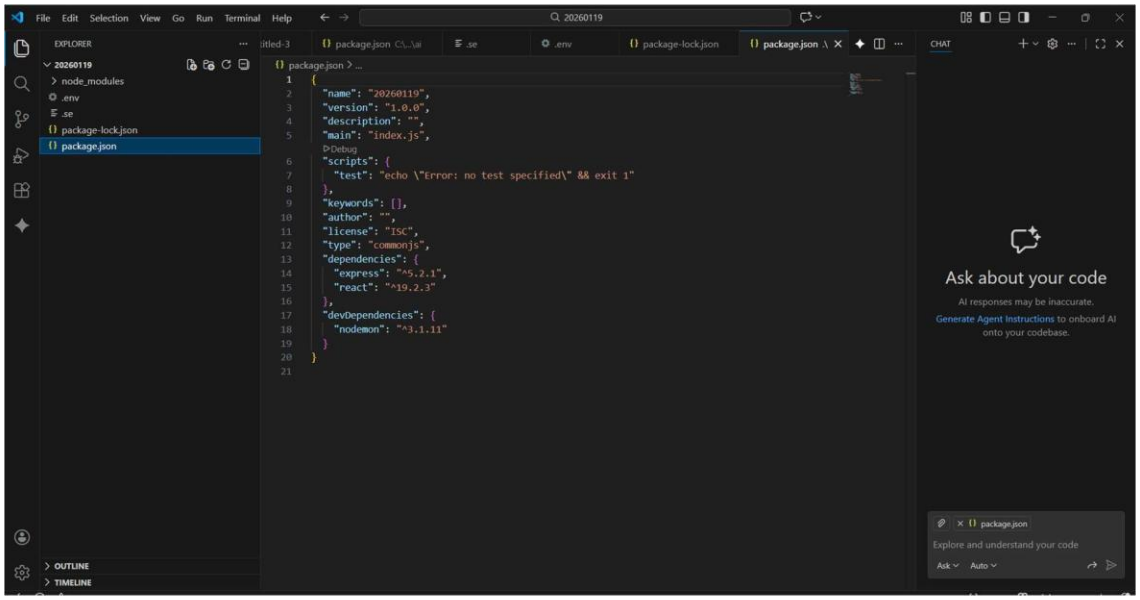


File Edit Selection View Go Run Terminal Help
20260119
Welcome
Untitled-3
package.json C:\...\ai
.se
.env
package-lock.json
package.json
Untitled-1
CHAT
.env
Generate code (Ctrl+I), or select a language (Ctrl+K M). Start typing to dismiss or don't show this again.
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
powershell
Ask about your code
AI responses may be inaccurate.
Generate Agent Instructions to onboard AI onto your codebase.
Explore and understand your code
Ask
Auto
Ln 1, Col 1
Spaces: 4
UTF-8
CRLF
{ } Dotenv
Go Live
31°C
Sunny
Search
ENG
IN
15:20
19-01-2026

```
History restored

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> 
```



```
{
  "name": "20260119",
  "version": "1.0.0",
  "lockfileVersion": 3,
  "requires": true,
  "packages": {
    "": {
      "name": "20260119",
      "version": "1.0.0",
      "license": "ISC",
      "dependencies": {
        "express": "^5.2.1",
        "react": "^19.2.3"
      },
      "devDependencies": {
        "nodemon": "^3.1.11"
      }
    },
    "node_modules/accepts": {
      "version": "2.0.0",
      "resolved": "https://registry.npmjs.org/accepts/-/accepts-2.0.0.tgz",
      "integrity": "sha512-5cvg6CtKwfgdmVqY1WIiXKc3Q1bkRqGLi+2W/6ao+6Y7gu/RCwRuAhGEzh5B4KlszSuTLgZYuqFqo5bImjNKng==",
      "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-KMReFUr0B4t+D+OBkjR3KYqvocp2XaSzO5cUcB6mgQMd3KbcE+mWTyvVV7D/zsdEbNnV6acZUutkiHQXvTr1Rw==",
      "dev": true,
      "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": "sha512-3oSeUO0TMV67hN1AmbXsK4yaqU7tjiHlbxRDZOpH0KW9+CeX4bRAaX0Anxt0tx2MrpRpWwQaPwIlISEJhYU5Pw==",
      "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",
```

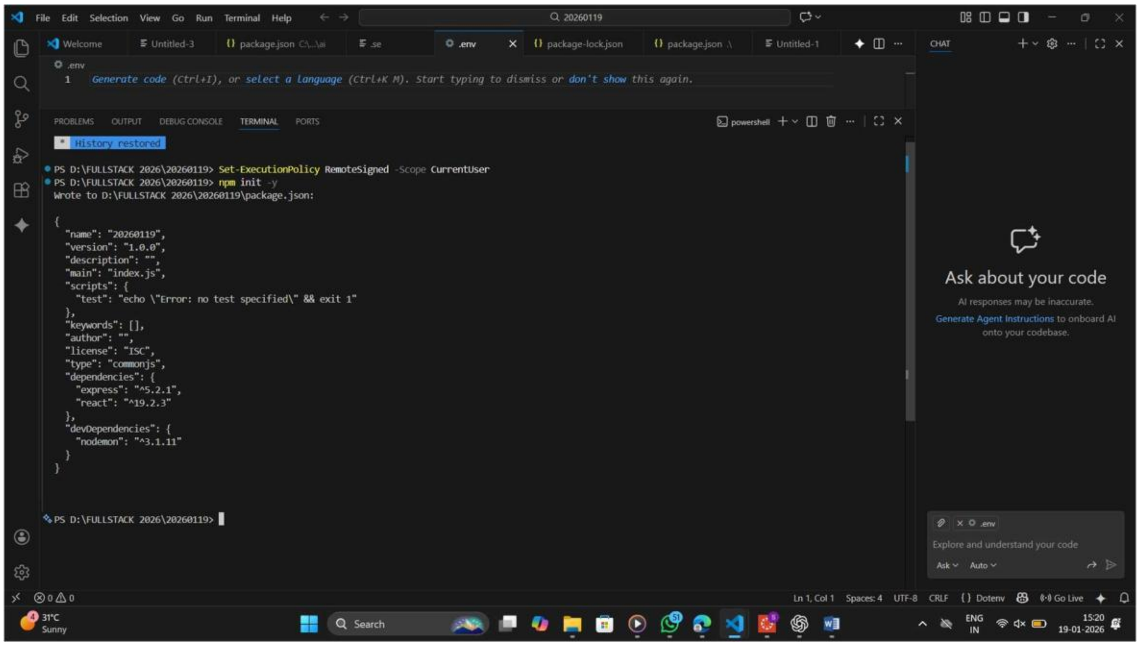


```
{
  "name": "20260119",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  ▷Debug
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "type": "commonjs",
  "dependencies": {
    "express": "^5.2.1",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

Ask about your code

AI responses may be inaccurate.

Generate Agent Instructions to onboard AI onto your codebase.



```
1   Generate code (Ctrl+I), or select a language (Ctrl+K M). Start typing to dismiss or don't show this again.
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```
 * History restored

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    "react": "^19.2.3"
  },
  "devDependencies": {
    "nodemon": "^3.1.11"
  }
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PS D:\FULLSTACK 2026\20260119> █
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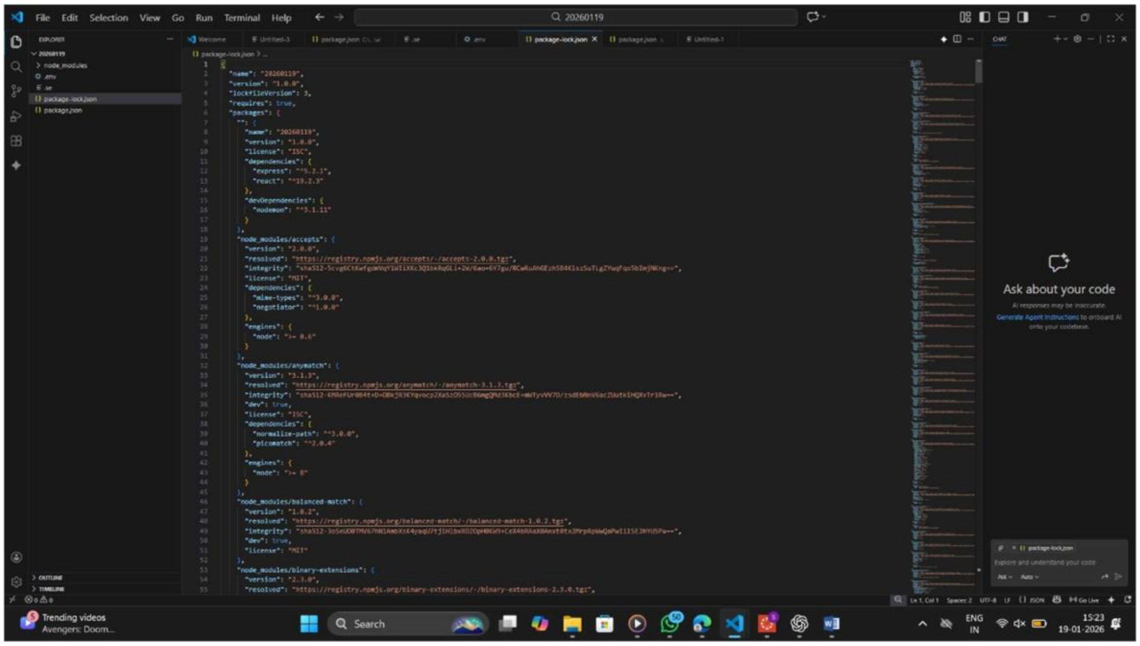

```json
{
  "name": "20260119",
  "version": "1.0.0",
  "lockfileVersion": 3,
  "requires": true,
  "packages": {
    "": {
      "name": "20260119",
      "version": "1.0.0",
      "license": "ISC",
      "dependencies": {
        "express": "^5.2.1",
        "react": "^19.2.3"
      },
      "devDependencies": {
        "nodemon": "^3.1.11"
      }
    },
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      "resolved": "https://registry.npmjs.org/accepts/-/accepts-2.0.0.tgz",
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      "license": "MIT",
      "dependencies": {
        "mime-types": "^3.0.0",
        "negotiator": "^1.0.0"
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      "version": "3.1.3",
      "resolved": "https://registry.npmjs.org/anymatch/-/anymatch-3.1.3.tgz",
      "integrity": "sha512-KMReFUr0B4t+D+OBkjR3KYqvocp2XaSzO55UcB6mgQMd3KbcE+mWTyvVV7D/zsdEbNnV6acZUutkiHQXvTr1Rw==",
      "dev": true,
      "license": "ISC",
      "dependencies": {
        "normalize-path": "^3.0.0",
        "picomatch": "^2.0.4"
      },
      "engines": {
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      }
    },
    "node_modules/balanced-match": {
      "version": "1.0.2",
      "resolved": "https://registry.npmjs.org/balanced-match/-/balanced-match-1.0.2.tgz",
      "integrity": "sha512-3oSeUO0TMV67hN1AmbXsK4yaqU7tjiHlbxRDZOpH0KW9+CeX4bRAaX0Anxt0tx2MrpRpWwQaPwIlISEJhYU5Pw==",
      "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",
```

Ask about your code

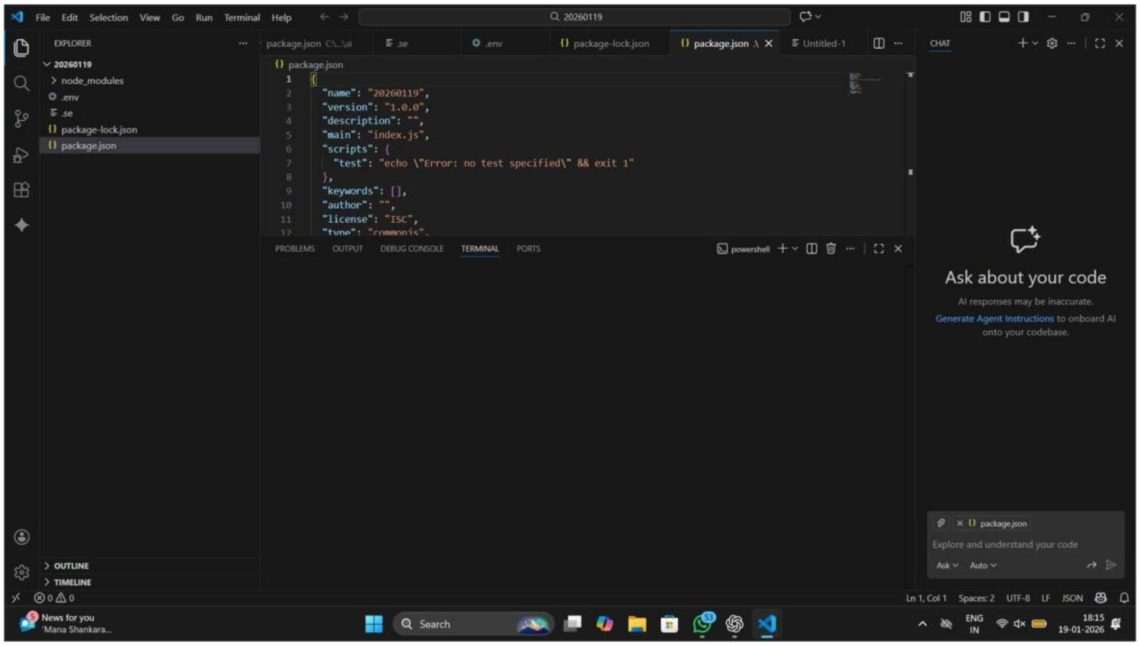
AI responses may be inaccurate.

Generate Agent Instructions to onboard AI onto your codebase.

package-lock.json

Explore and understand your code

Ask Auto



package.json

```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",
```

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package.json

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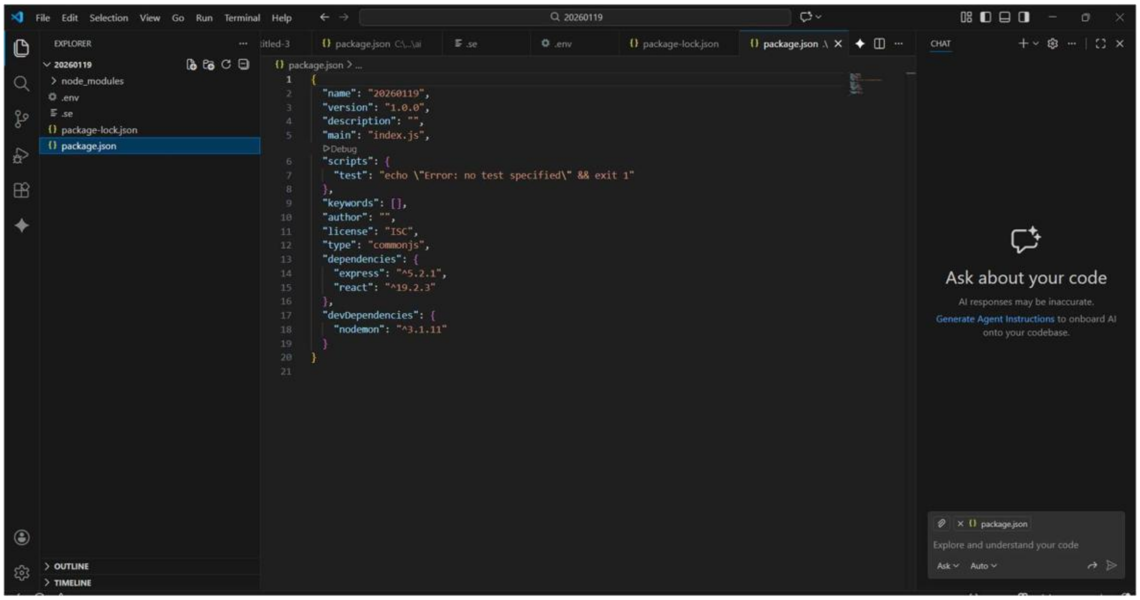

```
{
  "name": "20260119",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
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  "dependencies": {
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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