CMPS 350 – Web Development Fundamentals

Lab 08 – Web API using Next.js

Objective

- Create Web API using Next.js
- Use Next.js routing
- Test Web API using Postman and Chai HTTP

Resources

- Next.js: Getting Started, Routing Fundamentals, Defining Routes, Route Handlers, and File Conventions (`route.js`)
- HTTP response status codes
- Getting Started with Postman

Part 1 - Bank Web API

The goal of this exercise is to develop a Web API using Next.js 13.2 for managing a collection of bank accounts and their associated transactions.

1. Create a new a new folder named **`lab08-bank-app`** and open it in VS Code.
2. Create a Next.js application using **`npx create-next-app@latest --experimental-app .`**
   To keep it simple, answer No to all questions:

```
√ Would you like to use TypeScript with this project? ... No / Yes
√ Would you like to use ESLint with this project? ... No / Yes
√ Would you like to use `src/` directory with this project? ... No / Yes
√ What import alias would you like configured? ... @/*
```

3. Run the app using **`npm run dev`**
4. Create a new **`data`** directory under **`lab08-bank-app`**, and then paste the provided ***`accounts.json`*** and ***`trans.js`*** files. Thess files will be utilized for reading, adding, updating, and deleting accounts and transactions data.
5. Create **`accounts-repo.js`** under `/api/accounts` to implement and test the functions to get/add/update/delete accounts in `accounts.json` file and also functions to get/add transactions in `trans.json` file. When adding a transaction make sure to update the account balance.
6. Within the `api` directory, create the required directories and `route.js` files to define and handle the following API routes. The route handlers should use the functions from the **`accounts-repo.js`**

Method	URL	Description
`GET`	`/api/accounts/`	Returns all accounts. If `?type=acctType` query parameter is passed then use it to filter the accounts to return.
`POST`	`/api/accounts`	Adds a new account and returns it

`GET`	`/api/accounts/:id`	Returns the account by id
`PUT`	`/api/accounts/:id`	Updates the account having id and returns it
`DELETE`	`/api/accounts/:id`	Deletes the account having id
`GET`	`/api/accounts/:id/transactions`	Returns all transactions for the account having `id`
`POST`	`/api/accounts/:id/transactions`	Adds a new transaction for the account having `id` and returns the transaction id.

7. Account identifiers are unique and randomly generated by the API using Nano ID.
8. Include a catch-all, **`[[...all]]`**, route to handle invalid routes.
9. Use a `try...catch` statement to handle server errors for every request.
10. Return a JSON response and status code using `Response.json(body, { status: code })` for every route.

    Set the correct status code for every response and, when a request fails, include a meaningful message.
11. Test the API using Postman.
12. Create a `bank-api.spec.js` and test the methods of the API using Mocha/Chai and Chai HTTP.

Part 2 – Bank Front-end Client

The goal of this part is to develop a front-end client that uses the bank Web API and allows the end-user to manage a collection of accounts and their associated transactions. The app should have the following four pages:

- **`accounts.html`**: displays a table with all account information and a drop-down list to filter them by type.

  Provide a link besides each account to get the account transactions.

  Provide a link besides each account to add a new account transaction.

  Provide a delete button to allow deleting accounts with zero balance.
- **`transactions.html`**: displays a table of transactions for a particular account including the transaction type, amount, and date.
- **`new-account.html`**: provides a form to create a new account, specifying the type and the initial balance.
- **`new-transaction.html`**: provides a form to create a new transaction, specifying the account number, type, and amount. A message should be displayed when a transaction fails, for example, if the balance is insufficient to perform a withdrawal.