Test Strategy - Simple React + Node.js App

1. Introduction

This document outlines the test strategy for a basic full-stack web application consisting of a React frontend and a Node.js backend. The goal is to demonstrate automation capabilities across UI and API layers for a QA Automation Engineer position.

2. Application Overview

The project is based on a simple React + Node.js application retrieved from GitHub and extended with authentication and item management (add/edit/delete). Data attributes (`data-cy`) were used to facilitate clean Cypress test selectors. API endpoints were implemented to manage users and items.

3. Scope of Testing

The testing covers both frontend (UI) and backend (API) layers.

4. Functional UI Automation (Cypress)

- Framework: Cypress (with custom commands and environment variables).
- Environment-based credentials (`Cypress.env`).
- Scenarios automated:
  • Login with valid and invalid credentials
  • Create item (via button and Enter key)
  • Edit item
  • Delete item
  • Assertion after actions (e.g., item not found after deletion)
- Custom Cypress commands implemented for reusability.

5. API Test Automation (Postman + Newman)

- Collection contains full coverage of endpoints:
  • POST /login (valid and invalid)
  • GET /items
  • POST /items
  • PUT /items/:id
  • DELETE /items/:id

- Tests implemented with `pm.test` assertions.
- Run via CLI using: `newman run postman/Tests.postman_collection.json`

6. Tools & Justification

- Cypress: Modern, powerful UI automation tool with excellent developer experience.
- Postman/Newman: Industry-standard for quick API development/testing.
- GitHub Actions: Simple and effective CI integration.
- Node.js/React: Common stack for modern web apps.

7. How to Run the Tests

Locally:
- Start the app using `npm run build && npm start`
- Run Cypress: `npx cypress open` or `npx cypress run`
- Run API tests: `newman run postman/Tests.postman_collection.json`

GitHub Actions:
- Go to GitHub → Actions → Choose `CI Pipeline` → Click `Run Workflow`
- Tests will execute both Cypress and Postman automatically

8. Assumptions & Limitations

- The app is assumed to be run locally on port 8080.
- This is a minimal CRUD app for demonstration purposes.
- Code coverage and visual testing were considered but skipped for time constraints.
- Cypress Cloud can be integrated to provide rich visual test history and analytics.