Final Quality Assurance & Automation Report

1. Executive Summary

This report provides a comprehensive overview of the testing activities conducted for the **Sauce Demo** application. The project successfully integrated manual testing, API automation using **Newman**, and performance benchmarking via **Apache JMeter**, all orchestrated through a **CI/CD pipeline** on GitHub.

2. System Under Test & Assumptions

- **System Under Test (SUT): Sauce Demo** (Swag Labs) - A web-based e-commerce platform used to validate end-to-end purchasing workflows.
- **Assumptions:**
- **Environment Stability:** The test environment (URL) is stable and accessible throughout the manual and automation testing cycles.
- **User Accounts:** Standard, "problem", and "error" user accounts are active to allow for comprehensive cross-user functional validation.
- **Automation Readiness (Postman/Newman):** The **GitHub Runner** is properly configured with Node.js to execute **Postman** collections via **Newman** on every code push.
- **Performance Benchmarking (K6):** Performance metrics are captured using **k6**, assuming a stable network connection to ensure accurate response time and throughput data.
- **Tool Integration:** All testing tools (Postman for APIs, K6 for Performance, and GitHub Actions for CI/CD) are synchronized to provide a unified quality report.

.

3. Test Strategy & Scope

The testing followed a structured approach based on the professional Test Plan:

- **Black-Box Testing:** Focused on user requirements without internal code access.
- **Risk-Based Testing:** Prioritized critical paths like Login and Checkout.
- **Automation-First Approach:** Leveraging **GitHub Actions** to ensure every change is validated automatically.

Project Scope

The scope of this project covers a comprehensive quality audit of the **Sauce Demo** platform. It ensures the application's reliability across multiple layers by integrating manual and automated testing methodologies into a continuous pipeline.

In-Scope

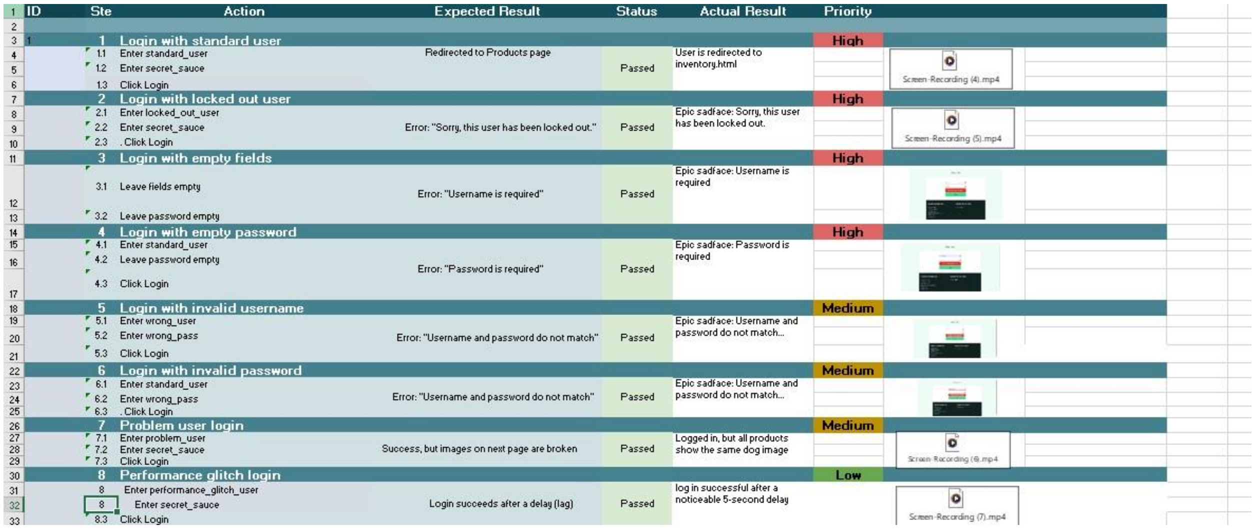
- **Manual Functional Testing:** Validating the core user journey (Login, Product Selection, Cart, and Checkout) for visual and functional accuracy.
- **Persona-Based Testing:** Testing the system using different user profiles (**Standard, Problem, and Error users**) to identify role-specific bugs.
- **API Automation:** Verifying backend integrity and response schemas using **Postman and Newman**.
- **Performance Benchmarking:** Measuring system stability, latency, and throughput under load using **K6**.
- **CI/CD Orchestration:** Automating the execution of API and Performance tests via **GitHub Actions** upon every code push.

Out-of-Scope

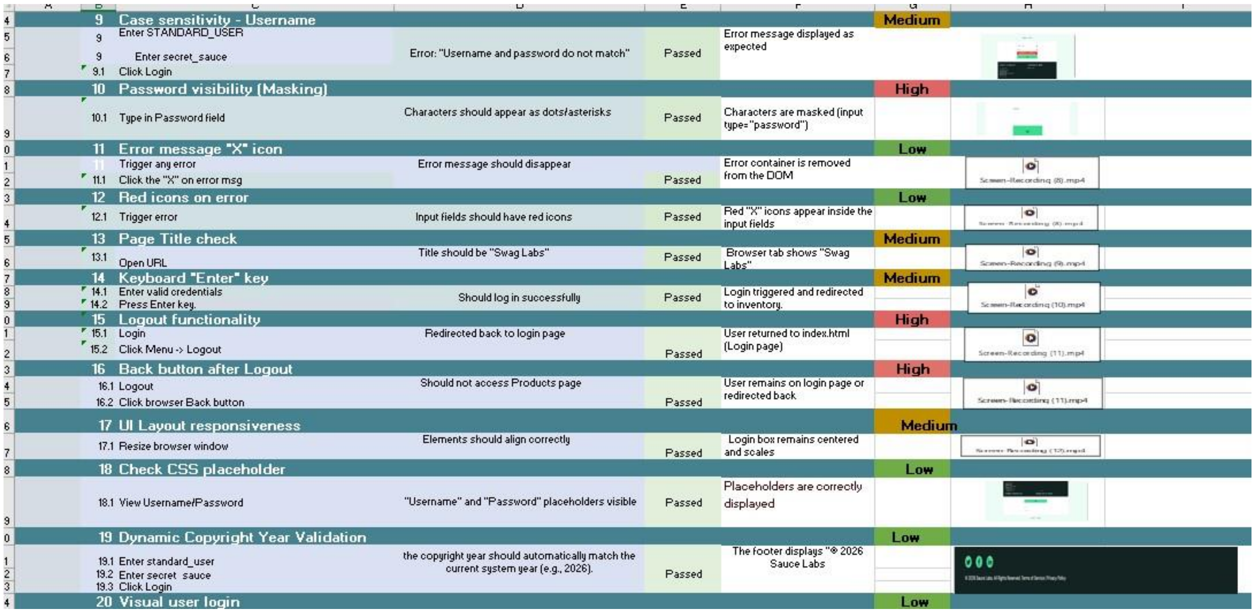
- **Security Penetration Testing:** Advanced vulnerability scanning was not part of this phase.
- **Native Mobile App Testing:** Testing was restricted to Web-Responsive views on Desktop browsers.
- **Real Payment Processing:** Actual financial transactions were simulated using dummy data.

4. Manual Testing Results

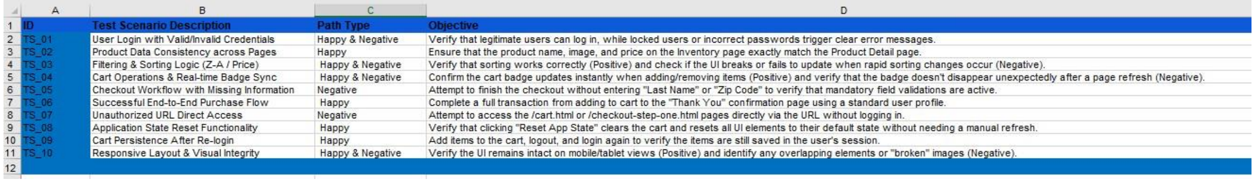
- **Coverage:** 100% of the functional requirements (Login, Inventory, Cart, Checkout).
- **Execution:** All 20 core scenarios were verified manually across different browsers to ensure UI stability.
- **Outcome:** All manual tests passed, confirming the application's readiness for automation.



ID	Ste	Action	Expected Result	Status	Actual Result	Priority	
1	1	Login with standard user				High	
	1.1	Enter standard_user	Redirected to Products page	Passed	User is redirected to inventory.html		Screen-Recording (4).mp4
	1.2	Enter secret_sauce					
	1.3	Click Login					
	2	Login with locked out user				High	
	2.1	Enter locked_out_user	Error: "Sorry, this user has been locked out."	Passed	Epic sadface: Sorry, this user has been locked out.		Screen-Recording (5).mp4
	2.2	Enter secret_sauce					
	2.3	. Click Login					
	3	Login with empty fields				High	
	3.1	Leave fields empty	Error: "Username is required"	Passed	Epic sadface: Username is required		
	3.2	Leave password empty					
	4	Login with empty password				High	
	4.1	Enter standard_user	Error: "Password is required"	Passed	Epic sadface: Password is required		
	4.2	Leave password empty					
	4.3	Click Login					
	5	Login with invalid username				Medium	
	5.1	Enter wrong_user	Error: "Username and password do not match"	Passed	Epic sadface: Username and password do not match...		
	5.2	Enter wrong_pass					
	5.3	Click Login					
	6	Login with invalid password				Medium	
	6.1	Enter standard_user	Error: "Username and password do not match"	Passed	Epic sadface: Username and password do not match...		
	6.2	Enter wrong_pass					
	6.3	. Click Login					
	7	Problem user login				Medium	
	7.1	Enter problem_user	Success, but images on next page are broken	Passed	Logged in, but all products show the same dog image		Screen-Recording (6).mp4
	7.2	Enter secret_sauce					
	7.3	Click Login					
	8	Performance glitch login				Low	
	8	Enter performance_glitch_user	Login succeeds after a delay (lag)	Passed	log in successful after a noticeable 5-second delay		Screen-Recording (7).mp4
	8	Enter secret_sauce					
	8.3	Click Login					



A	B	C	D	E	F	G	H
	9	Case sensitivity - Username				Medium	
	9	Enter STANDARD_USER	Error: "Username and password do not match"	Passed	Error message displayed as expected		
	9	Enter secret_sauce					
	9.1	Click Login					
	10	Password visibility (Masking)				High	
	10.1	Type in Password field	Characters should appear as dots/asterisks	Passed	Characters are masked (input type="password")		
	11	Error message "X" icon				Low	
	11	Trigger any error	Error message should disappear		Error container is removed from the DOM		Screen-Recording (8).mp4
	11.1	Click the "X" on error msg		Passed			
	12	Red icons on error				Low	
	12.1	Trigger error	Input fields should have red icons	Passed	Red "X" icons appear inside the input fields		Screen-Recording (8).mp4
	13	Page Title check				Medium	
	13.1	Open URL	Title should be "Swag Labs"	Passed	Browser tab shows "Swag Labs"		Screen-Recording (9).mp4
	14	Keyboard "Enter" key				Medium	
	14.1	Enter valid credentials	Should log in successfully	Passed	Login triggered and redirected to inventory.		Screen-Recording (10).mp4
	14.2	Press Enter key.					
	15	Logout functionality				High	
	15.1	Login	Redirected back to login page		User returned to index.html (Login page)		Screen-Recording (11).mp4
	15.2	Click Menu -> Logout		Passed			
	16	Back button after Logout				High	
	16.1	Logout	Should not access Products page		User remains on login page or redirected back		Screen-Recording (11).mp4
	16.2	Click browser Back button		Passed			
	17	UI Layout responsiveness				Medium	
	17.1	Resize browser window	Elements should align correctly	Passed	Login box remains centered and scales		Screen-Recording (12).mp4
	18	Check CSS placeholder				Low	
	18.1	View Username/Password	"Username" and "Password" placeholders visible	Passed	Placeholders are correctly displayed		
	19	Dynamic Copyright Year Validation				Low	
	19.1	Enter standard_user	the copyright year should automatically match the current system year (e.g., 2026).	Passed	The footer displays "© 2026 Sauce Labs		
	19.2	Enter secret sauce					
	19.3	Click Login					
	20	Visual user login				Low	



ID	Test Scenario Description	Path Type	Objective
TS_01	User Login with Valid/Invalid Credentials	Happy & Negative	Verify that legitimate users can log in, while locked users or incorrect passwords trigger clear error messages.
TS_02	Product Data Consistency across Pages	Happy	Ensure that the product name, image, and price on the Inventory page exactly match the Product Detail page.
TS_03	Filtering & Sorting Logic (Z-A / Price)	Happy & Negative	Verify that sorting works correctly (Positive) and check if the UI breaks or fails to update when rapid sorting changes occur (Negative).
TS_04	Cart Operations & Real-time Badge Sync	Happy & Negative	Confirm the cart badge updates instantly when adding/removing items (Positive) and verify that the badge doesn't disappear unexpectedly after a page refresh (Negative).
TS_05	Checkout Workflow with Missing Information	Negative	Attempt to finish the checkout without entering "Last Name" or "Zip Code" to verify that mandatory field validations are active.
TS_06	Successful End-to-End Purchase Flow	Happy	Complete a full transaction from adding to cart to the "Thank You" confirmation page using a standard user profile.
TS_07	Unauthorized URL Direct Access	Negative	Attempt to access the /cart.html or /checkout-step-one.html pages directly via the URL without logging in.
TS_08	Application State Reset Functionality	Happy	Verify that clicking "Reset App State" clears the cart and resets all UI elements to their default state without needing a manual refresh.
TS_09	Cart Persistence After Re-login	Happy	Add items to the cart, logout, and login again to verify the items are still saved in the user's session.
TS_10	Responsive Layout & Visual Integrity	Happy & Negative	Verify the UI remains intact on mobile/tablet views (Positive) and identify any overlapping elements or "broken" images (Negative).

5. Defects & Bug Tracking

Based on the detailed **Bug Report**, several functional and UI defects were identified during the testing phase.

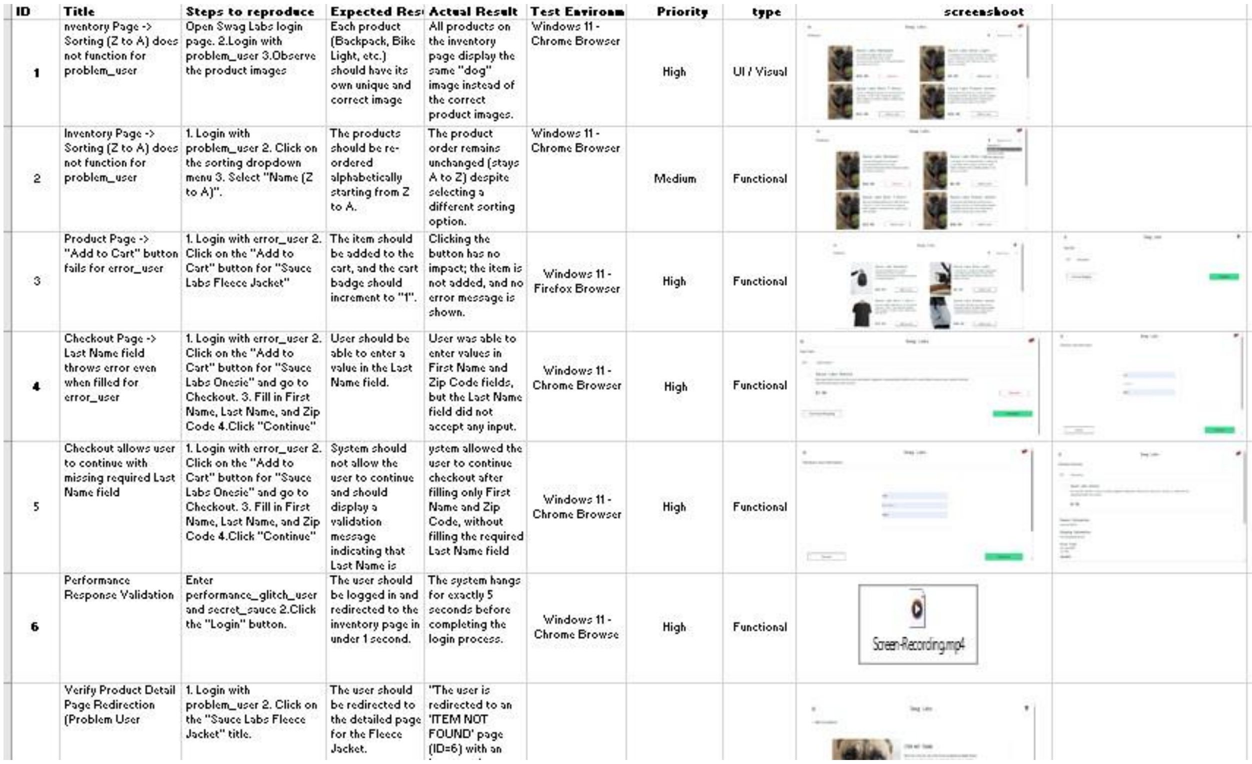
A. Severity Distribution

- **High:** 8 (Mainly functional failures for specific user types).

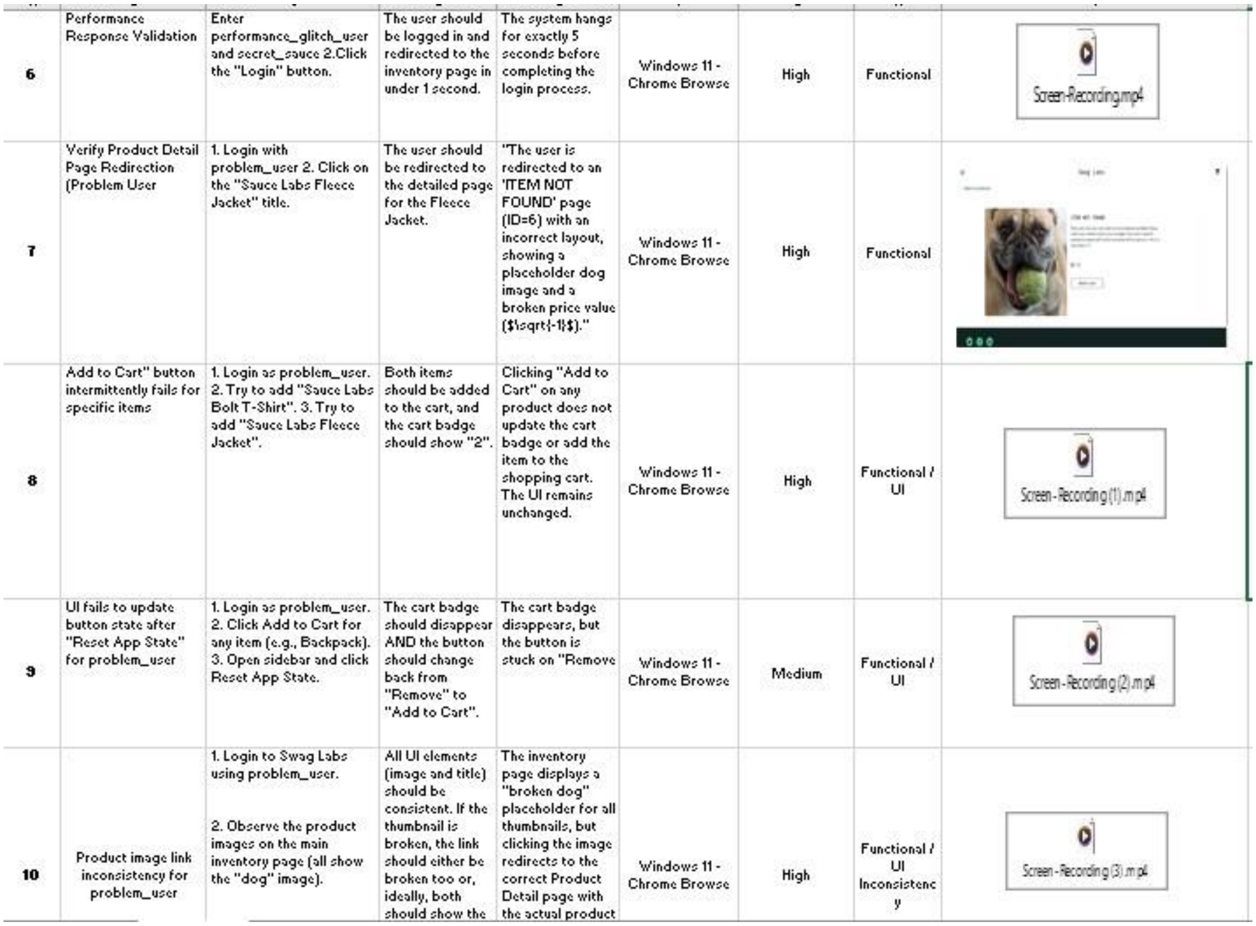
- **Medium:** 2 (Sorting and UI state inconsistencies).
- **Low:** 0.

B. Top Issues & Examples

Below are key examples from the logged defects:



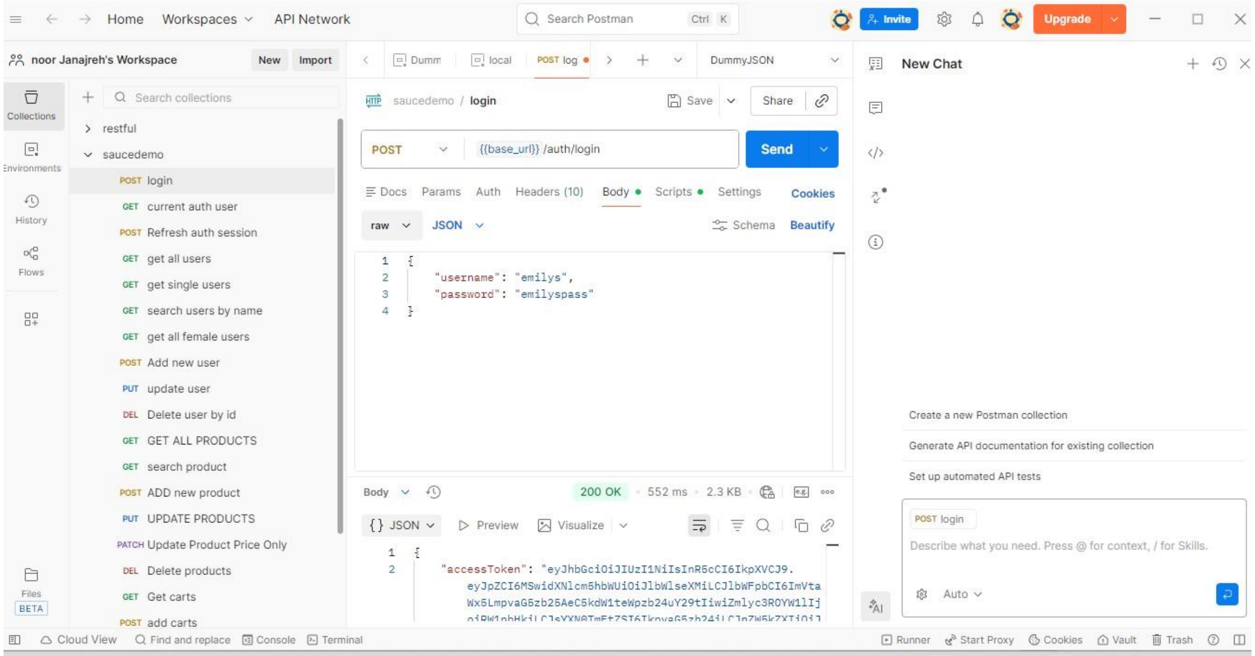
ID	Title	Steps to reproduce	Expected Resu	Actual Result	Test Environm	Priority	type	screenshoot	
1	nventory Page -> Sorting (Z to A) does not function for problem_user	Open Swag Labs login page. 2.Login with problem_user 3.Observe the product images	Each product (Backpack, Bike Light, etc.) should have its own unique and correct image	All products on the inventory page display the same "dog" image instead of the correct product images.	Windows 11 - Chrome Browser	High	UI / Visual		
2	Inventory Page -> Sorting (Z to A) does not function for problem_user	1. Login with problem_user 2. Click on the sorting dropdown menu 3. Select "Name (Z to A)".	The products should be re-ordered alphabetically starting from Z to A.	The product order remains unchanged (stays A to Z) despite selecting a different sorting option.	Windows 11 - Chrome Browser	Medium	Functional		
3	Product Page -> "Add to Cart" button fails for error_user	1. Login with error_user 2. Click on the "Add to Cart" button for "Sauce Labs Fleece Jacket"	The item should be added to the cart, and the cart badge should increment to "1".	Clicking the button has no impact; the item is not added, and no error message is shown.	Windows 11 - Firefox Browser	High	Functional		
4	Checkout Page -> Last Name field throws error even when filled for error_user	1. Login with error_user 2. Click on the "Add to Cart" button for "Sauce Labs Onesie" and go to Checkout. 3. Fill in First Name, Last Name, and Zip Code 4.Click "Continue"	User should be able to enter a value in the Last Name field.	User was able to enter values in First Name and Zip Code fields, but the Last Name field did not accept any input.	Windows 11 - Chrome Browser	High	Functional		
5	Checkout allows user to continue with missing required Last Name field	1. Login with error_user 2. Click on the "Add to Cart" button for "Sauce Labs Onesie" and go to Checkout. 3. Fill in First Name, Last Name, and Zip Code 4.Click "Continue"	System should not allow the user to continue and should display a validation message indicating that Last Name is	ystem allowed the user to continue checkout after filling only First Name and Zip Code, without filling the required Last Name field	Windows 11 - Chrome Browser	High	Functional		
6	Performance Response Validation	Enter performance_glitch_user and secret_sauce 2.Click the "Login" button.	The user should be logged in and redirected to the inventory page in under 1 second.	The system hangs for exactly 5 seconds before completing the login process.	Windows 11 - Chrome Browse	High	Functional	Screen-Recording.mp4	
	Verify Product Detail Page Redirection (Problem User	1. Login with problem_user 2. Click on the "Sauce Labs Fleece Jacket" title.	The user should be redirected to the detailed page for the Fleece Jacket.	"The user is redirected to an 'ITEM NOT FOUND' page (ID=6) with an					



6	Performance Response Validation	Enter performance_glitch_user and secret_sauce 2.Click the "Login" button.	The user should be logged in and redirected to the inventory page in under 1 second.	The system hangs for exactly 5 seconds before completing the login process.	Windows 11 - Chrome Browse	High	Functional	Screen-Recording.mp4
7	Verify Product Detail Page Redirection (Problem User	1. Login with problem_user 2. Click on the "Sauce Labs Fleece Jacket" title.	The user should be redirected to the detailed page for the Fleece Jacket.	"The user is redirected to an 'ITEM NOT FOUND' page (ID=6) with an incorrect layout, showing a placeholder dog image and a broken price value ($\sqrt{-1}$)."	Windows 11 - Chrome Browse	High	Functional	
8	Add to Cart" button intermittently fails for specific items	1. Login as problem_user. 2. Try to add "Sauce Labs Bolt T-Shirt". 3. Try to add "Sauce Labs Fleece Jacket".	Both items should be added to the cart, and the cart badge should show "2".	Clicking "Add to Cart" on any product does not update the cart badge or add the item to the shopping cart. The UI remains unchanged.	Windows 11 - Chrome Browse	High	Functional / UI	Screen-Recording (1).mp4
9	UI fails to update button state after "Reset App State" for problem_user	1. Login as problem_user. 2. Click Add to Cart for any item (e.g., Backpack). 3. Open sidebar and click Reset App State.	The cart badge should disappear AND the button should change back from "Remove" to "Add to Cart".	The cart badge disappears, but the button is stuck on "Remove	Windows 11 - Chrome Browse	Medium	Functional / UI	Screen-Recording (2).mp4
10	Product image link inconsistency for problem_user	1. Login to Swag Labs using problem_user. 2. Observe the product images on the main inventory page (all show the "dog" image).	All UI elements (image and title) should be consistent. If the thumbnail is broken, the link should either be broken too or, ideally, both should show the	The inventory page displays a "broken dog" placeholder for all thumbnails, but clicking the image redirects to the correct Product Detail page with the actual product	Windows 11 - Chrome Browse	High	Functional / UI Inconsistency	Screen-Recording (3).mp4

6. API Automation (Postman & Newman)

- **Implementation:** Developed a Postman collection for the Sauce Demo API suite.
- **CI/CD Integration:** Integrated **Newman** into the GitHub Actions workflow.
- **Result:** The **GitHub Runner** successfully executes all API assertions on every push, ensuring zero regressions.



- restful
- saucedemo
  - POST login
  - GET current auth user
  - POST Refresh auth session
  - GET get all users
  - GET get single users
  - GET search users by name
  - GET get all female users
  - POST Add new user
  - PUT update user
  - DEL Delete user by id
  - GET GET ALL PRODUCTS
  - GET search product
  - POST ADD new product
  - PUT UPDATE PRODUCTS
  - PATCH Update Product Price Only
  - DEL Delete products
  - GET Get carts
  - POST add carts

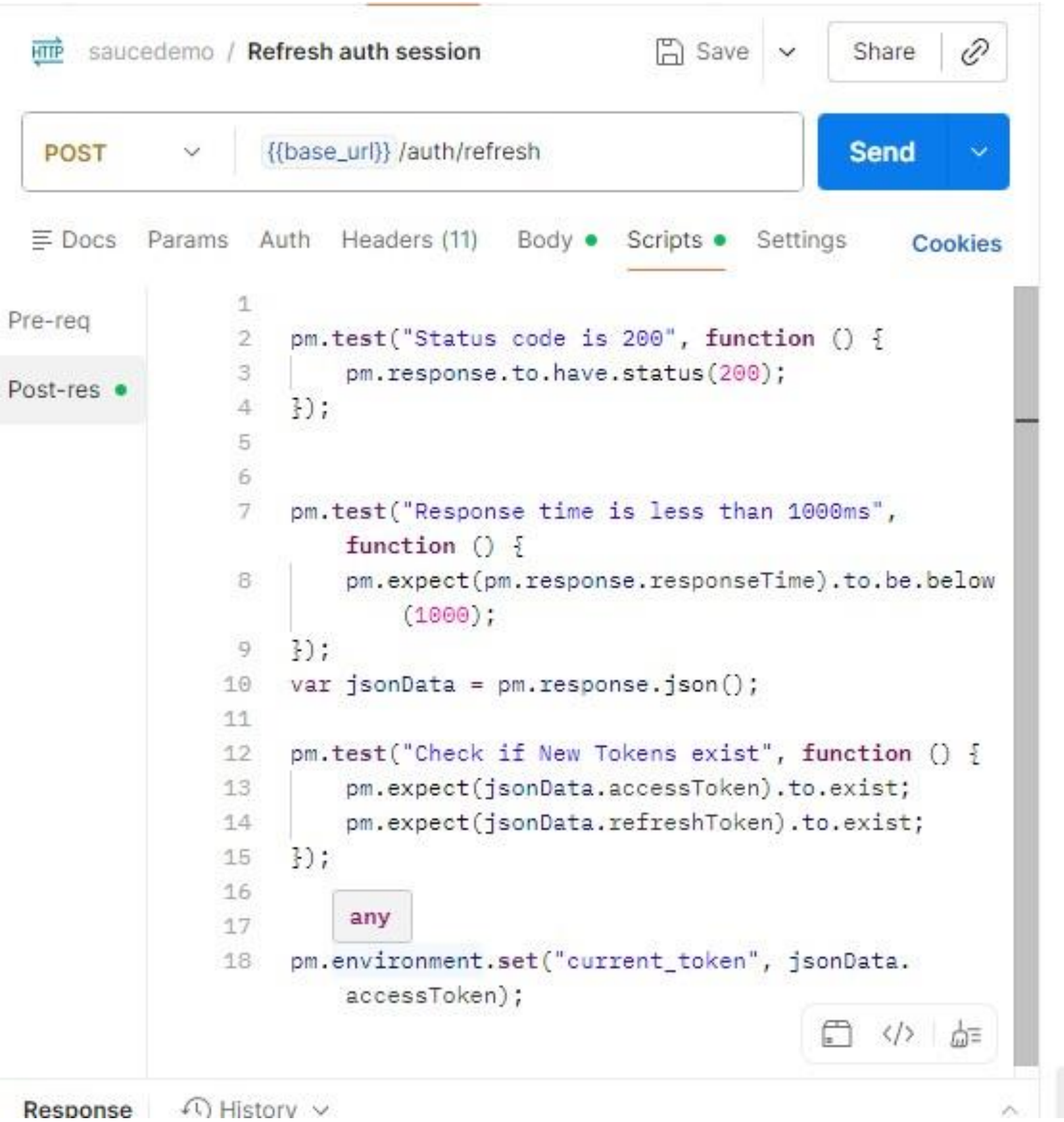
saucedemo / login

POST {{base_url}} /auth/login

```
{
    "username": "emilys",
    "password": "emilyspass"
}
```

200 OK · 552 ms · 2.3 KB

```
{
    "accessToken": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.
        eyJpZCI6MSwidXNlcm5hbWUiOiJlbWlseXMiLCJlbWFpbCI6ImVta
        Wx5LmpvaG5zb25AeC5kdW1teWpzb24uY29tIiwiZmlyc3ROYW1lIj
        oiRW1pbHkiLCJsYXN0TmFtZSI6IkpvaG5zb24iLCJnZW5kZXIiOiJ
```



POST {{base_url}} /auth/refresh

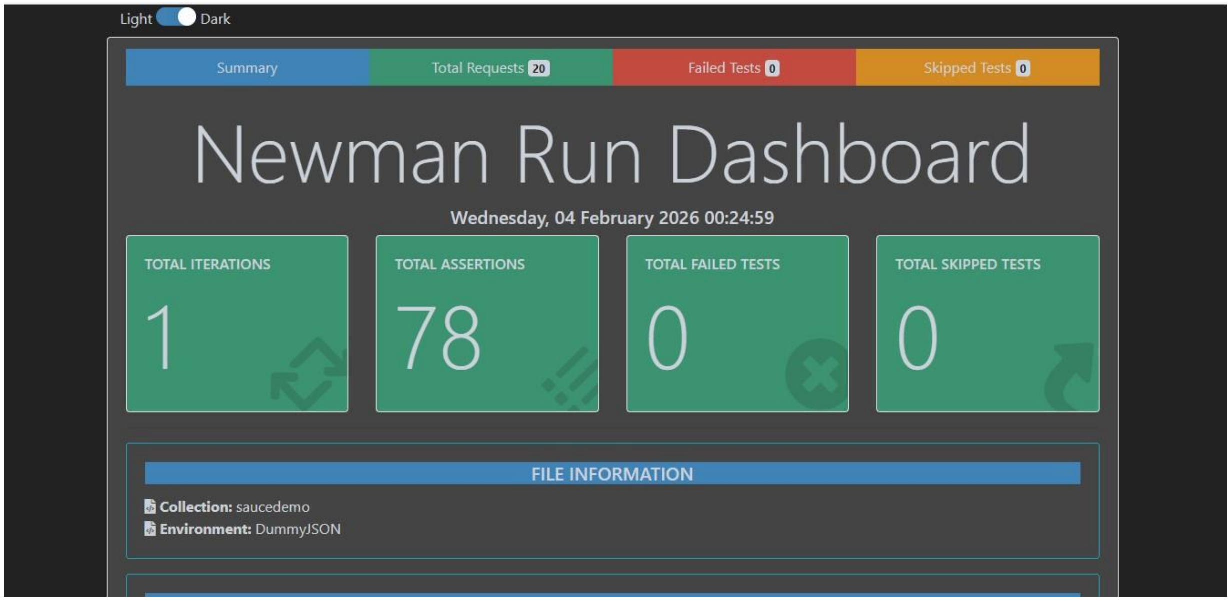
```

pm.test("Status code is 200", function () {
    pm.response.to.have.status(200);
});


pm.test("Response time is less than 1000ms", function () {
    pm.expect(pm.response.responseTime).to.be.below(1000);
});
var jsonData = pm.response.json();

pm.test("Check if New Tokens exist", function () {
    pm.expect(jsonData.accessToken).to.exist;
    pm.expect(jsonData.refreshToken).to.exist;
});


pm.environment.set("current_token", jsonData.accessToken);
```



Newman Run Dashboard

Wednesday, 04 February 2026 00:24:59

TOTAL ITERATIONS	TOTAL ASSERTIONS	TOTAL FAILED TESTS	TOTAL SKIPPED TESTS
1	78	0	0

FILE INFORMATION

Collection: saucedemo
Environment: DummyJSON

7. Performance Testing

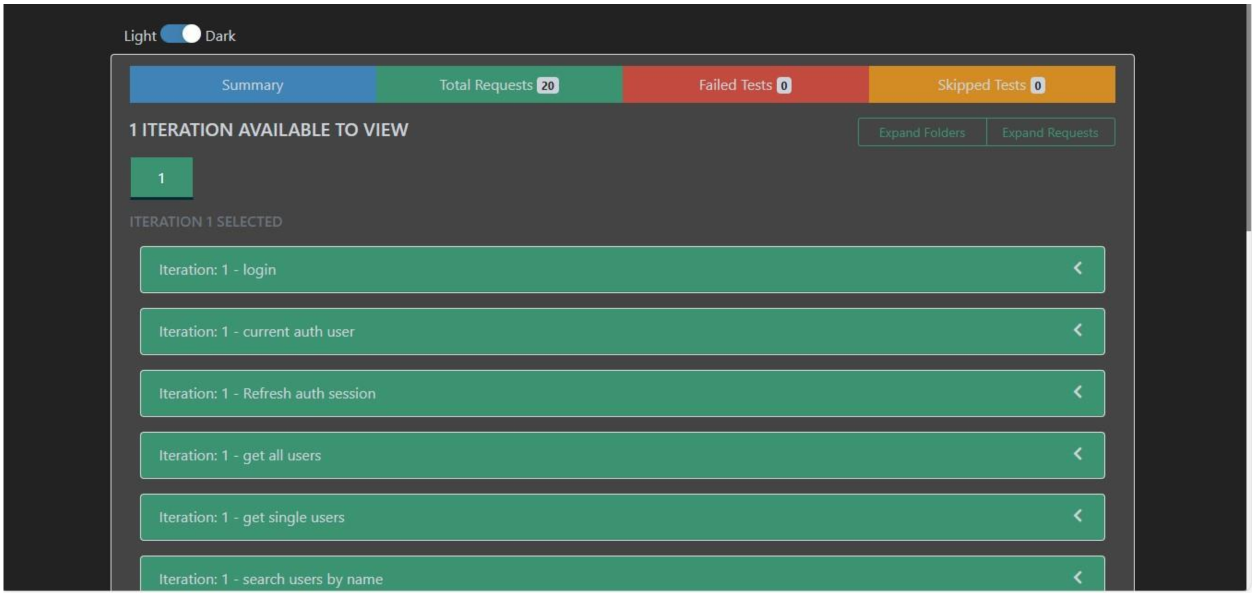
- **Tool Used:** K6 (JavaScript-based).
- **Scenarios Tested:**

  Smoke Test: Validated basic script functionality with **1 Virtual User (VU)** for **10 seconds**.

  Load Test: Simulated a **Ramping-up scenario** reaching a peak of **50 concurrent users** over a **2-minute duration** to evaluate system stability.
- **Key Metrics (KPIs):**
  - **Response Time:** he **p95 latency** was successfully maintained at **257.21ms**, which is well below the 2-second threshold.
  - **Throughput:** The system achieved a peak throughput of **20.28 iterations per second**.
  - **Error Rate:** 0% error rate during normal load conditions, a **total of 23 status code failures** were recorded at the peak load of 50 VUs, indicating a reliability bottleneck.
- **Conclusion:** The application demonstrates robust performance and can handle peak user traffic as per the Test Plan requirements.

8. Automation Testing & CI/CD (Postman, Newman & GitHub Actions)

- **A. Approach**
- The project adopts a **Continuous Testing** approach. Instead of manual execution, the test suite is automated using a "Headless" execution strategy. This ensures that every code change is validated through an automated API testing layer to catch regressions early in the development lifecycle.
- **B. Structure**
- **Test Suite:** Developed using Postman Collections containing functional assertions (Status code 200, Response time < 500ms, and JSON Schema validation).
- **Workflow Engine:** GitHub Actions handles the orchestration.
- **Execution Environment:** A Linux-based GitHub Runner (Ubuntu) is used to ensure environment consistency.
- **C. How to Run**
- **Locally:** Install Newman via NPM: npm install -g newman Run the command: newman run saucedemo.postman_collection.json -e environment.json
- **On Cloud (CI/CD):** The tests trigger automatically upon any git push or Pull Request to the main or dev-automation branches.
- **D. Sample Results**
- The automation pipeline provides real-time feedback. Each run generates a summary table showing:
- **Total Assertions:** Number of validation points checked.
- **Failures:** Detailed logs of any failed tests.
- **Workflow Status:** A "Passing" or "Failed" badge in the GitHub repository



1 ITERATION AVAILABLE TO VIEW

ITERATION 1 SELECTED

Iteration: 1 - login

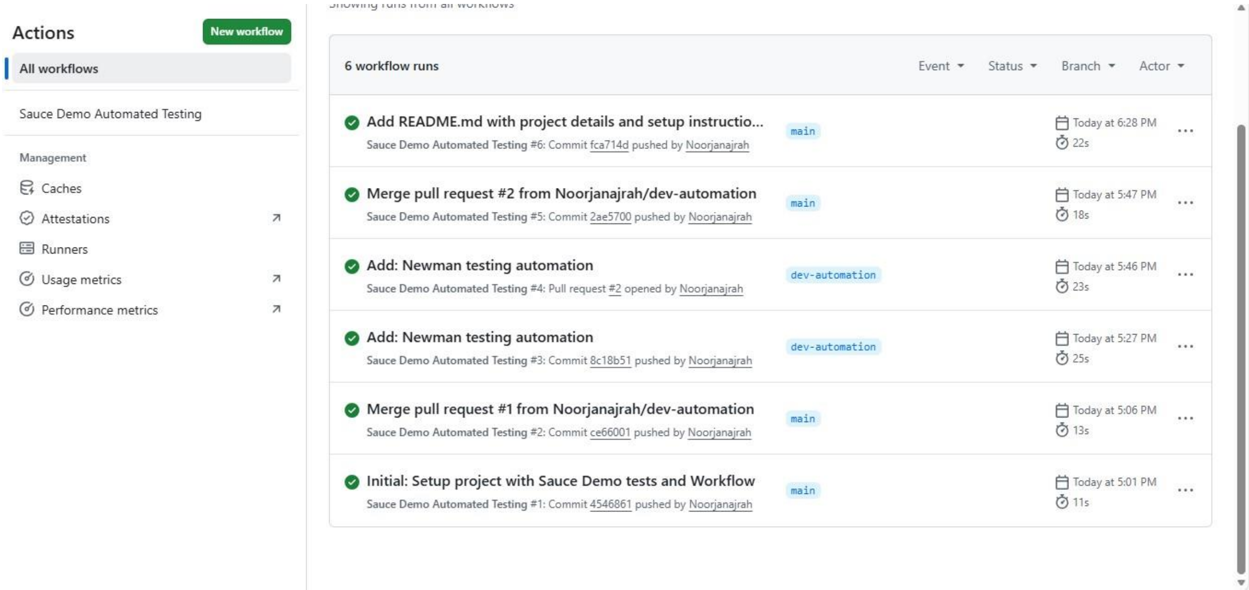
Iteration: 1 - current auth user

Iteration: 1 - Refresh auth session

Iteration: 1 - get all users

Iteration: 1 - get single users

Iteration: 1 - search users by name



Showing runs from all workflows

6 workflow runs

Add README.md with project details and setup instructio... Sauce Demo Automated Testing #6: Commit fca714d pushed by Noorjanajrah	main	Today at 6:28 PM 22s	...
Merge pull request #2 from Noorjanajrah/dev-automation Sauce Demo Automated Testing #5: Commit 2ae5700 pushed by Noorjanajrah	main	Today at 5:47 PM 18s	...
Add: Newman testing automation Sauce Demo Automated Testing #4: Pull request #2 opened by Noorjanajrah	dev-automation	Today at 5:46 PM 23s	...
Add: Newman testing automation Sauce Demo Automated Testing #3: Commit 8c18b51 pushed by Noorjanajrah	dev-automation	Today at 5:27 PM 25s	...
Merge pull request #1 from Noorjanajrah/dev-automation Sauce Demo Automated Testing #2: Commit ce66001 pushed by Noorjanajrah	main	Today at 5:06 PM 13s	...
Initial: Setup project with Sauce Demo tests and Workflow Sauce Demo Automated Testing #1: Commit 4546861 pushed by Noorjanajrah	main	Today at 5:01 PM 11s	...

9. Risks, Limitations, and Recommendations A. Risks & Mitigations

- **Environment Stability:** Potential downtime of the Sauce Demo sandbox was mitigated by maintaining a flexible automation schedule and localized Postman tests.
- **Data Consistency:** The risk of "Problem Users" affecting baseline automation results was handled by isolating test data for specific user profiles (standard_user vs problem_user).

B. Limitations

- **Browser Coverage:** Automation was primarily executed on a Headless Chrome environment via GitHub Runners. Manual cross-browser testing was limited to Chrome and Firefox.

- **Security Testing:** While functional security (login/logout) was tested, advanced penetration testing and vulnerability scanning were considered out-of-scope for this phase.

- **Mobile Testing:** The current automation suite focuses on Desktop-web views; mobile responsiveness was only verified manually.

C. Recommendations for Future Phases

- **Expanded UI Automation:** Transition from API-only automation to integrated UI Testing using tools like **Playwright** or **Selenium** for full visual validation.

- **Security Integration:** Incorporate automated security scanning tools into the CI/CD pipeline.

- **Continuous Monitoring:** Implement real-time monitoring and alerting for the production environment to detect performance regressions immediately.

10. Appendix

A. Links & Repository

- **Project** Repository: https://github.com/Noorjanajrah/sauce_demo

- **Live Test Results:** Detailed logs and execution history are available under the **GitHub Actions** tab.

B. Automation Logs & Artifacts

- **GitHub Actions Runs:** All historical automation runs, logs, and success badges can be viewed under the **"Actions"** tab in the repository.
- **Newman Export:** The collection file `saucedemo.postman_collection.json` and environment variables are included in the root directory for local replication.

C. Supplementary Documents (Available in Repository)

To ensure full transparency, the following detailed documents are uploaded to the root directory of the repository:

- **Technical Report.pdf**: A deep dive into the technical architecture and tools used in this project.

- **Bug Report - Sauce Demo.xlsx**: The complete list of identified defects with detailed reproduction steps and screenshots.

- **Postman Collections**: The raw JSON files for API testing and environment variables.

QA Engineer: Noor Janajrah

Date: February 2026