Security Assessment Report — Task 1

Target: OWASP Juice Shop (local Docker)

Date: 2025-10-19

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Executive Summary

I performed a hands-on assessment of a local OWASP Juice Shop instance running in Docker (http://localhost:3000). My goal was to identify common web application vulnerabilities following OWASP Top 10 guidance. I explored the application manually using a proxy and verified issues with Burp Repeater and browser DevTools. The testing uncovered several actionable issues ranging from injection and XSS to authentication and access-control weaknesses. The findings below reflect what I validated and the recommended fixes I propose.

Top findings (high level)

- SQL Injection (High)
- Sensitive Data Exposure (Medium)
- Persistent (Stored) Cross-Site Scripting (XSS) (High)
- Reflected Cross-Site Scripting (XSS) (Medium–High)
- Broken Authentication (Medium–High)
- DOM Cross-Site Scripting (DOM XSS) (Medium)
- Broken Access Control / IDOR (High)

Scope & Rules of Engagement

- **Scope:** Local OWASP Juice Shop instance deployed via Docker on my test machine.
- **Tools I used:** Burp Suite (Community), Firefox DevTools, curl, Docker logs, Nikto (optional), OWASP ZAP (optional).
- **Constraints:** I performed non-destructive testing only in an isolated lab environment. No data was exfiltrated beyond proof-of-concept evidence.

Methodology

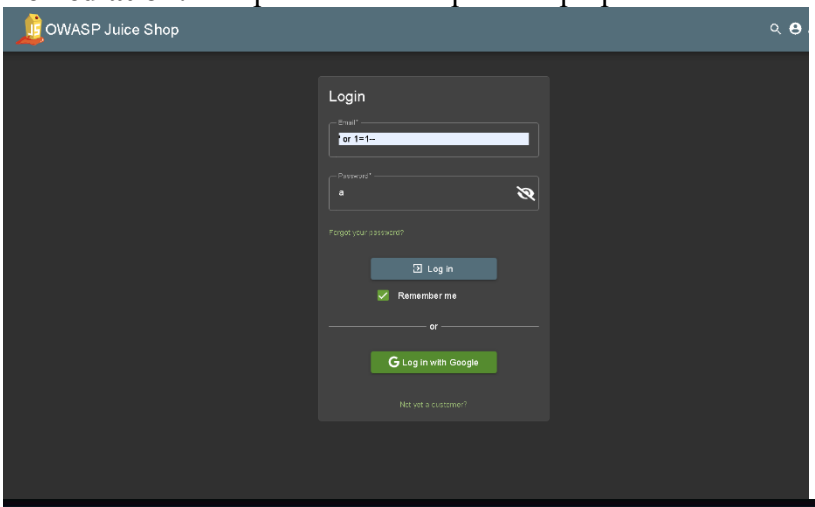
I followed a practical testing workflow:

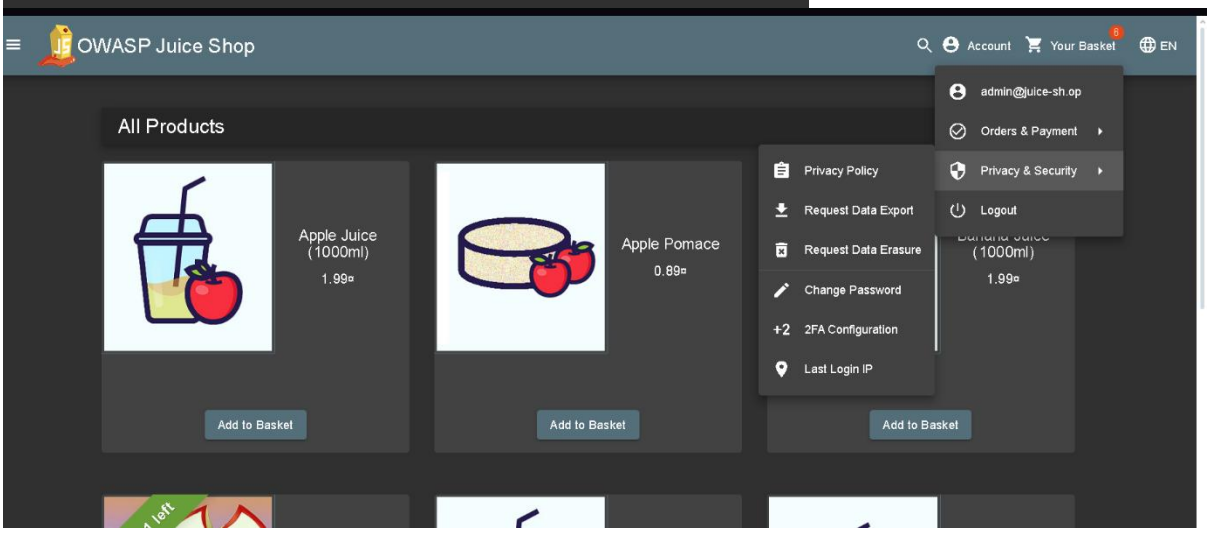
1. Reconnaissance: browsed the app with a proxy enabled, recorded endpoints, and exported HAR/Burp logs (see evidence files).
2. Passive analysis: reviewed traffic to identify input points and API endpoints.
3. Manual verification: used Burp Repeater to craft PoCs and confirmed vulnerabilities without causing harm.
4. Documentation: saved raw requests, screenshots, and concise remediation guidance for each finding.

Findings (detailed)

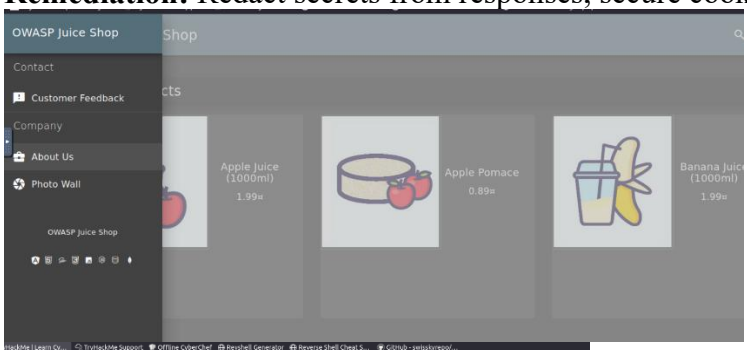
Each finding below includes a concise description, a PoC summary, impact, evidence pointers, and remediation I recommend.

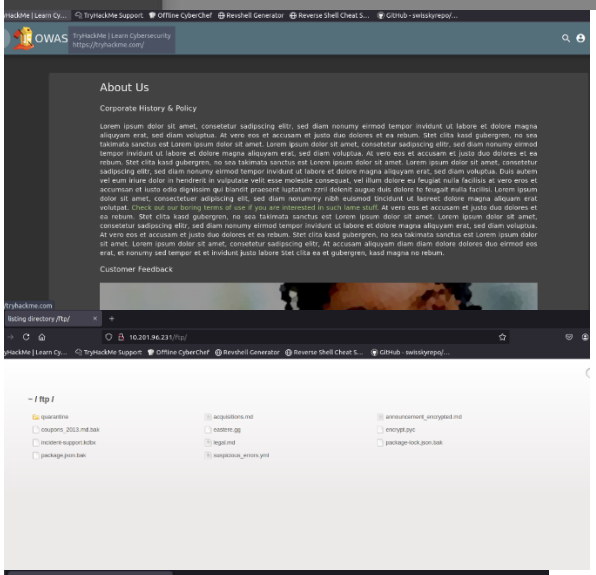
SQL Injection — High

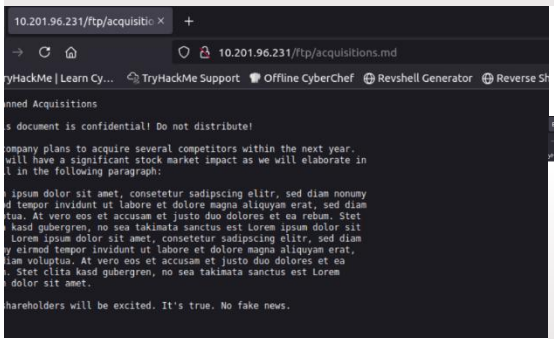
- **Issue:** Injection in authentication or search endpoint allows SQL payloads to manipulate query logic.
- **PoC (summary):** Used Burp Repeater to inject `admin' OR '1'='1` into the login (or search) parameter and observed authentication bypass / indicative database error.
- **Impact:** Attacker could bypass authentication, extract data or manipulate the database.
- **Remediation:** Use parameterized queries / prepared statements and validate input.
- 

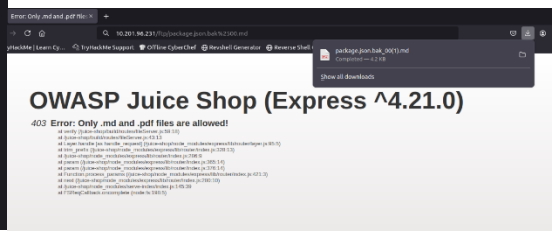
- 

Sensitive Data Exposure — Medium

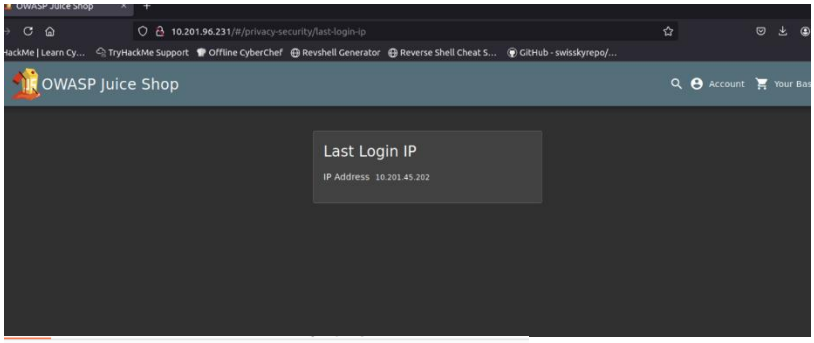
- **Issue:** API responses and storage expose sensitive fields or tokens; cookies missing flags.
- **PoC (summary):** Observed tokens in JSON responses and cookies without `HttpOnly`/`Secure`.
- **Impact:** Token theft or session compromise.
- **Remediation:** Redact secrets from responses, secure cookies, enforce TLS.
- 

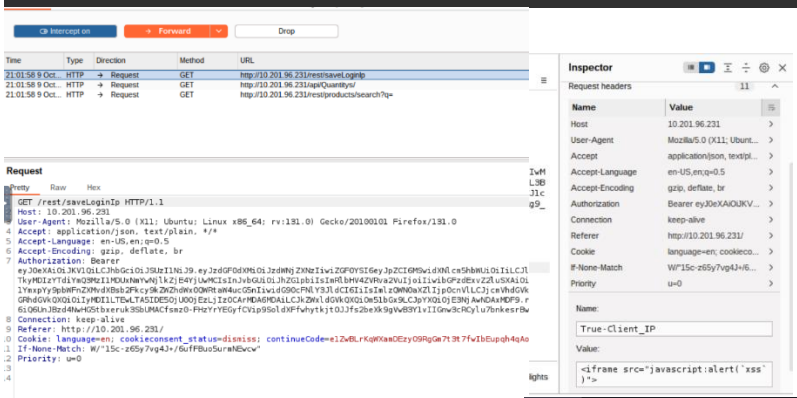
- 

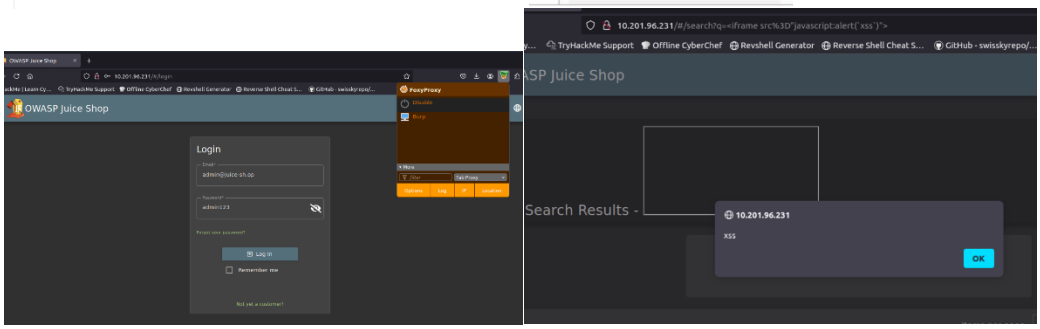
- 



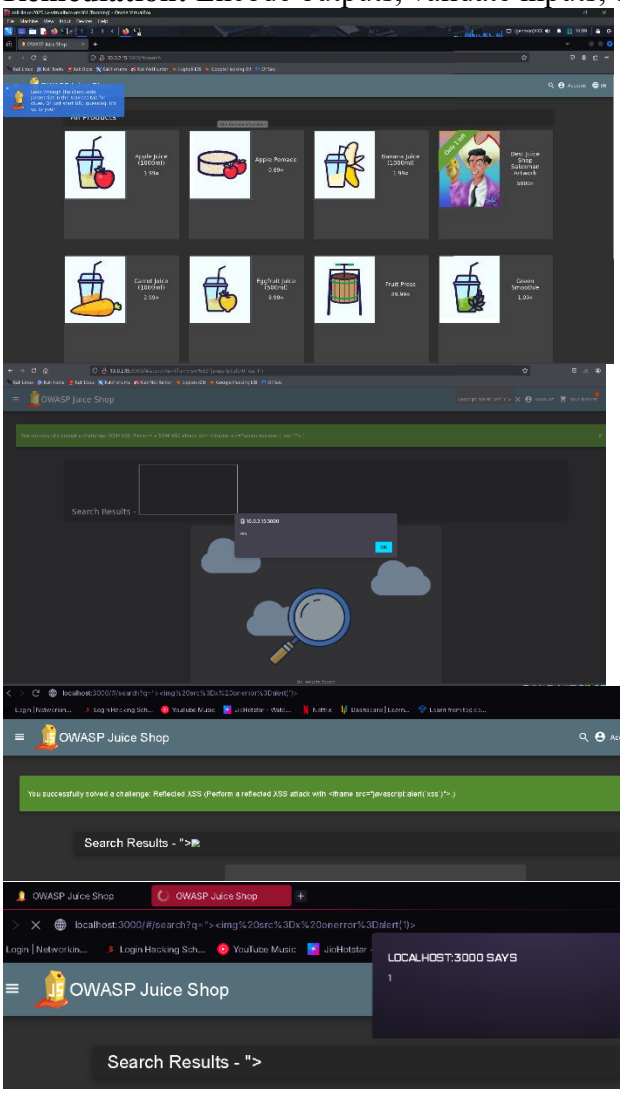
Persistent (Stored) XSS — High

- **Issue:** Stored XSS in product reviews or feedback that is persisted and later rendered to users.
- **PoC (summary):** Submitted `"><img src=x onerror=alert('stored-XSS')>` in a product review and the alert executed on page load
- **Impact:** Persistent client-side code execution; session theft or phishing.
- **Remediation:** Context-aware output encoding, whitelist allowed HTML, implement CSP.
- 

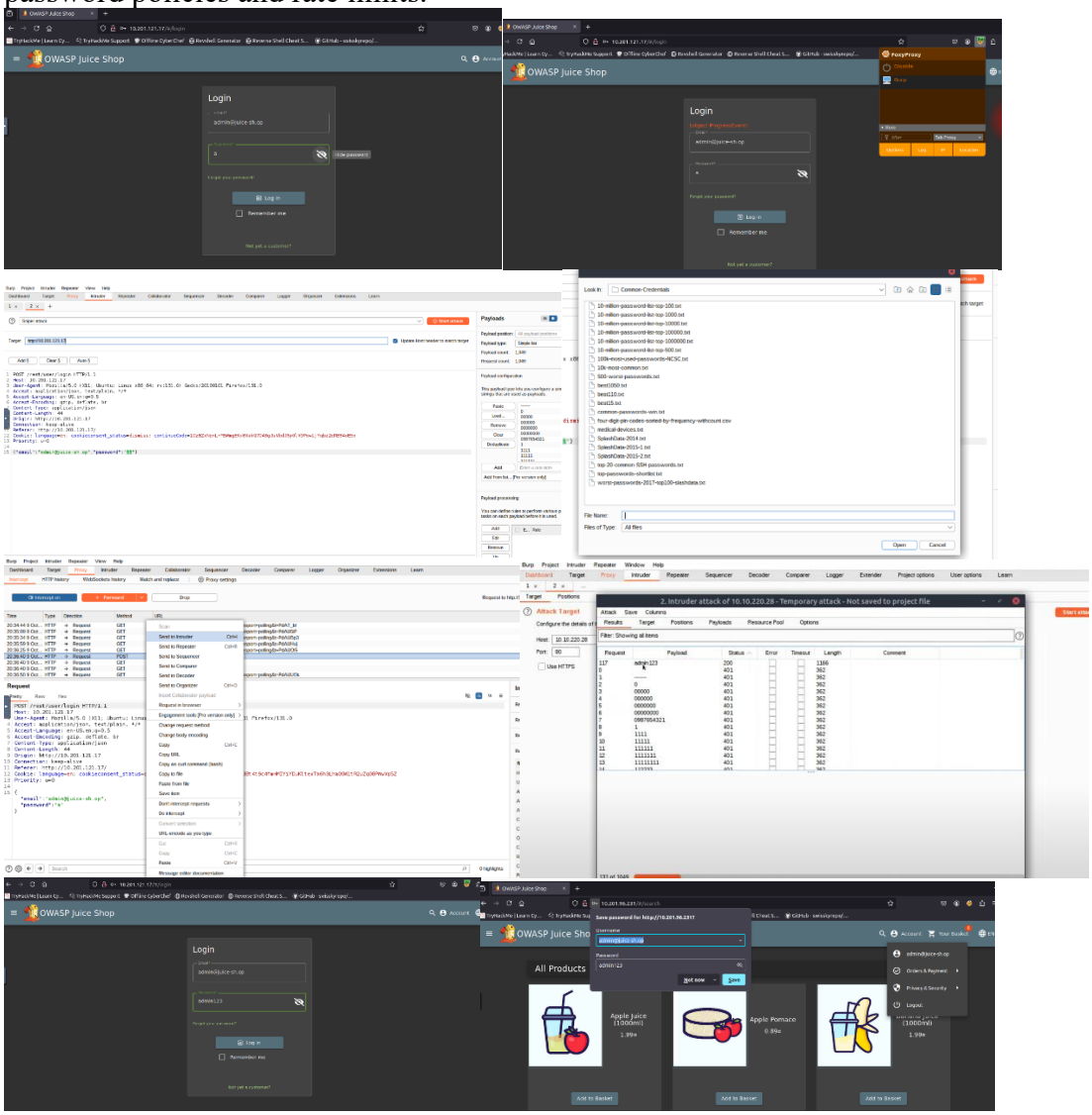
- 

- 

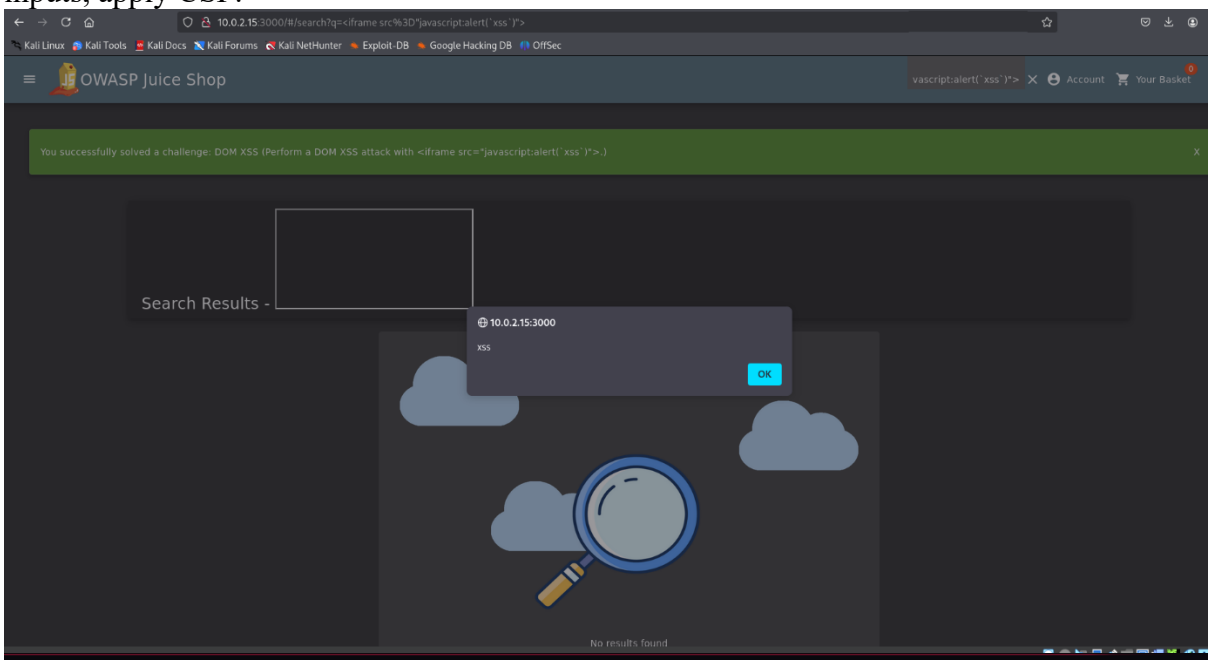
Reflected XSS — Medium–High

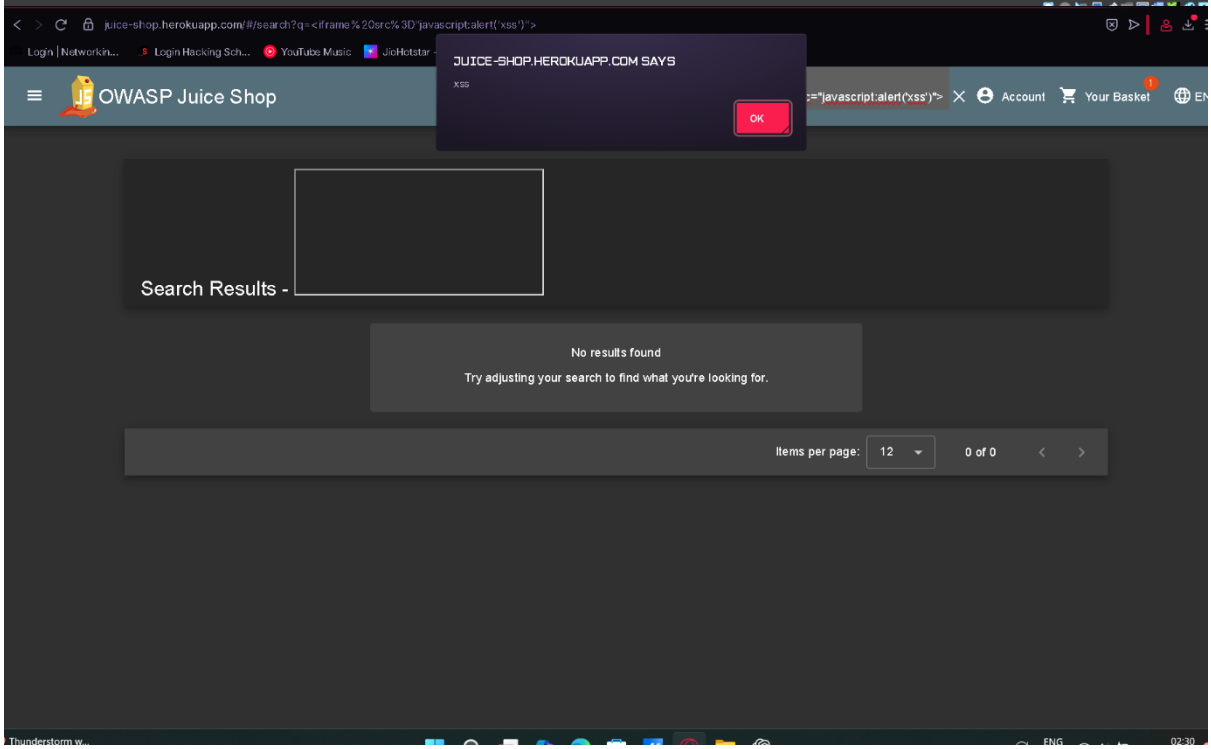
- **Issue:** Input reflected in server responses (search or error pages) leads to script execution when crafted links are used.
- **PoC (summary):** Reflected payload via search parameter executed in browser render.
- **Impact:** Script execution in victim's browser when they follow a crafted link.
- **Remediation:** Encode outputs, validate inputs, use CSP.
- 

Broken Authentication — Medium–High

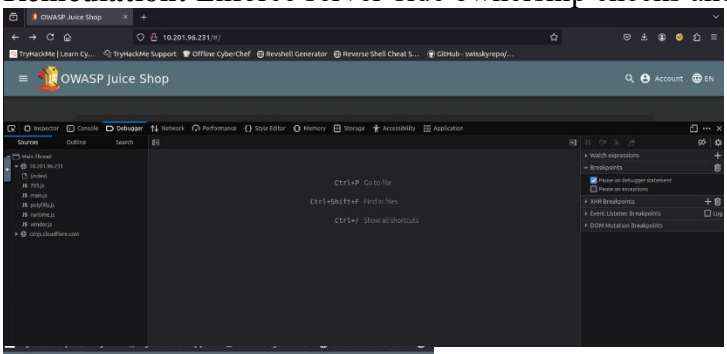
- **Issue:** Weak session management and authentication flows (e.g., session reuse, predictable reset tokens, missing account lockout).
- **PoC (summary):** Observed session cookie behaviors and token characteristics indicating potential reuse or weak reset flow
- **Impact:** Account takeover and session hijacking.
- **Remediation:** Rotate sessions on login, use `HttpOnly`/`Secure` flags, enforce strong password policies and rate limits.
- 

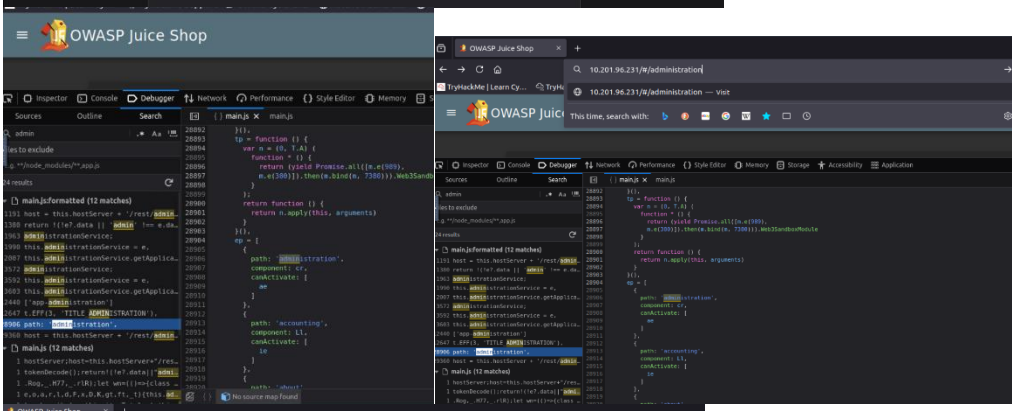
DOM XSS — Medium

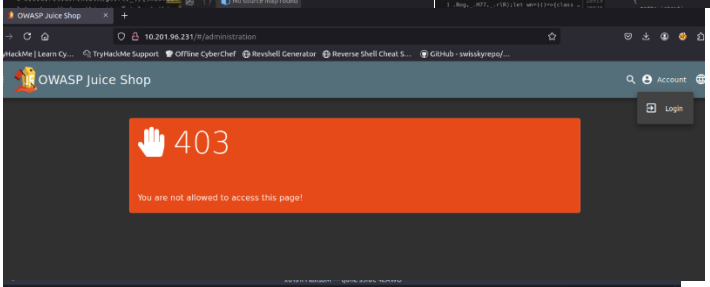
- **Issue:** Client-side JavaScript reads untrusted data from the URL fragment or localStorage and injects it into the DOM unsafely.
- **PoC (summary):** Visiting a crafted URL fragment triggered script execution without server interaction.
- **Impact:** Script runs in user's browser context; similar impacts to other XSS variants.
- **Remediation:** Avoid `innerHTML` with untrusted data, use `textContent`, sanitize inputs, apply CSP.
- 

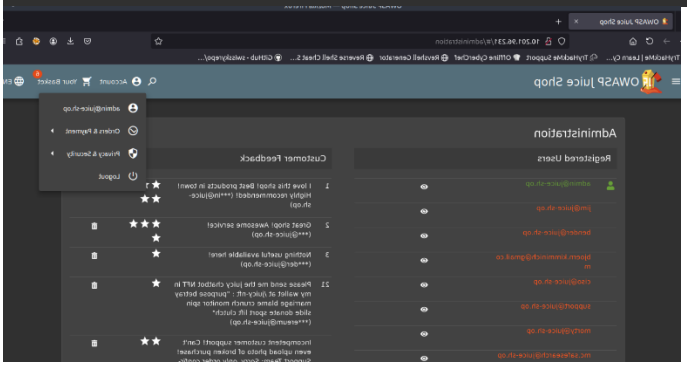
- 

Broken Access Control — High

- **Issue:** API endpoints return resources based on client-supplied IDs without verifying ownership.
- **PoC (summary):** Modified `GET /rest/orders/{id}` from one ID to another and retrieved another user's data.
- **Impact:** Unauthorized access to sensitive data.
- **Remediation:** Enforce server-side ownership checks and use opaque identifiers.
- 







🧩 Recommendations

- Regularly update and patch vulnerable components.
- Implement input validation and output encoding to prevent XSS and SQLi.
- Enforce strong authentication and role-based access controls.
- Avoid exposing sensitive information in responses or error messages.
- Use HTTPS and secure session handling to protect user data.

🧠 Learning Outcomes

- Understood how common web vulnerabilities work in real environments.
- Gained hands-on experience using **Burp Suite**, **browser proxy setup**, and **Juice Shop**.
- Learned to identify, exploit, and document findings like a SOC or pentest analyst.
- Improved practical understanding of **OWASP Top 10** risks.

🏁 Conclusion

Through the OWASP Juice Shop simulation, I explored and exploited multiple real-world vulnerabilities such as XSS, SQL Injection, Broken Auth, and Sensitive Data Exposure. This task strengthened my practical cybersecurity skills and improved my awareness of secure coding and web application defense practices.
