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Assignment 1

1. CWE: CWE-284: Improper Access Control

OSWAP CATEGORY: A01:2021- Broken Access Control

DESCRIPTION: The product does not restrict or incorrectly restricts access to a resource from an unauthorized actor.

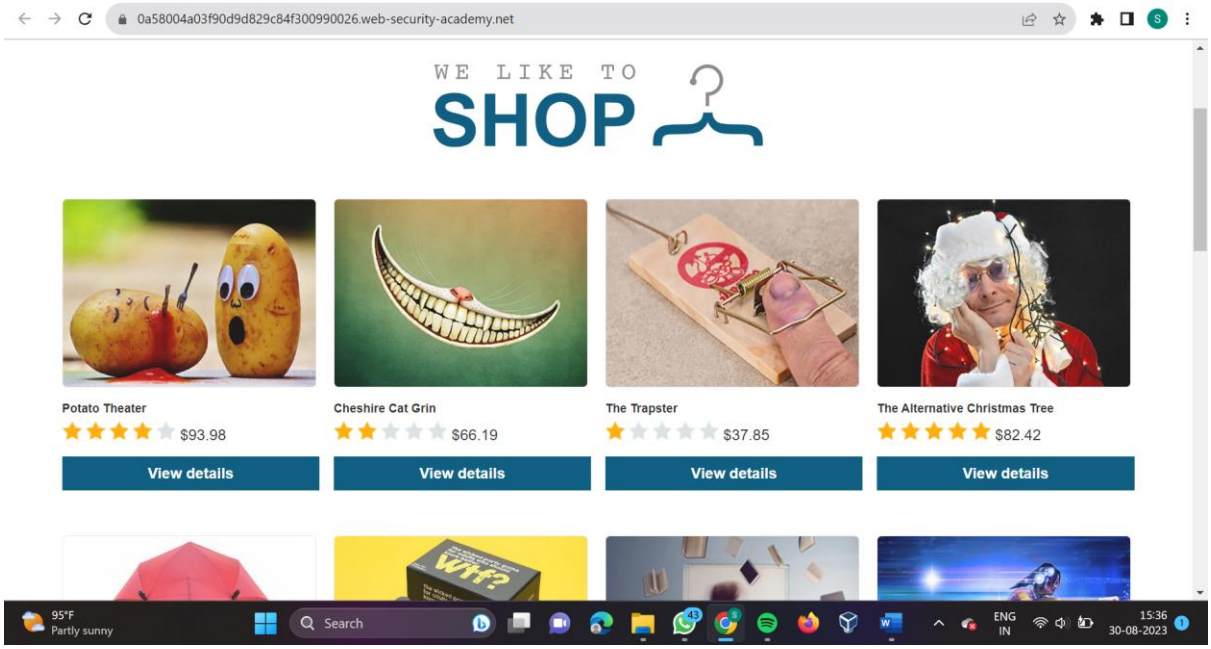
BUSINESS IMPACT: Access control involves the use of several protection mechanisms such as:

- Authentication (proving the identity of an agent)
- Authorization (ensures that a given agent can access the resource)
- Accountability (tracking of activities that were performed)

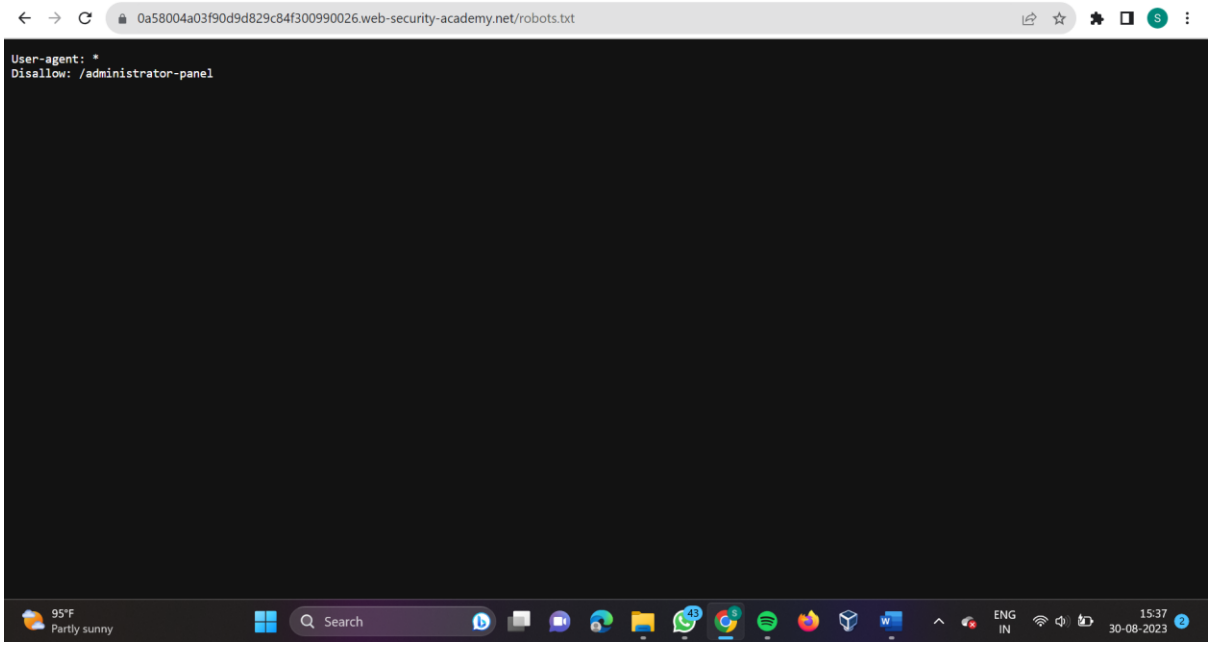
When a mechanism is not enforced or fails, an attacker can compromise product security by gaining privileges, reading sensitive information, executing commands, evading detection, and more.
Two separate behaviours can cause access control weaknesses:

- Specification: incorrect privileges, permissions, ownership, etc. are explicitly specified for either the user or the resource (for example, setting a password file to be world-writable, or giving administrator capabilities to a guest user). This action could be performed by the program or the administrator.
- Enforcement: the mechanism contains errors that prevent it from properly enforcing the specified access control requirements (e.g., allowing the user to specify their own privileges, or allowing a syntactically-incorrect ACL to produce insecure settings). This problem occurs within the program itself, in that it does not actually enforce the intended security policy that the administrator specifies.

Step 1:
Visit an example website

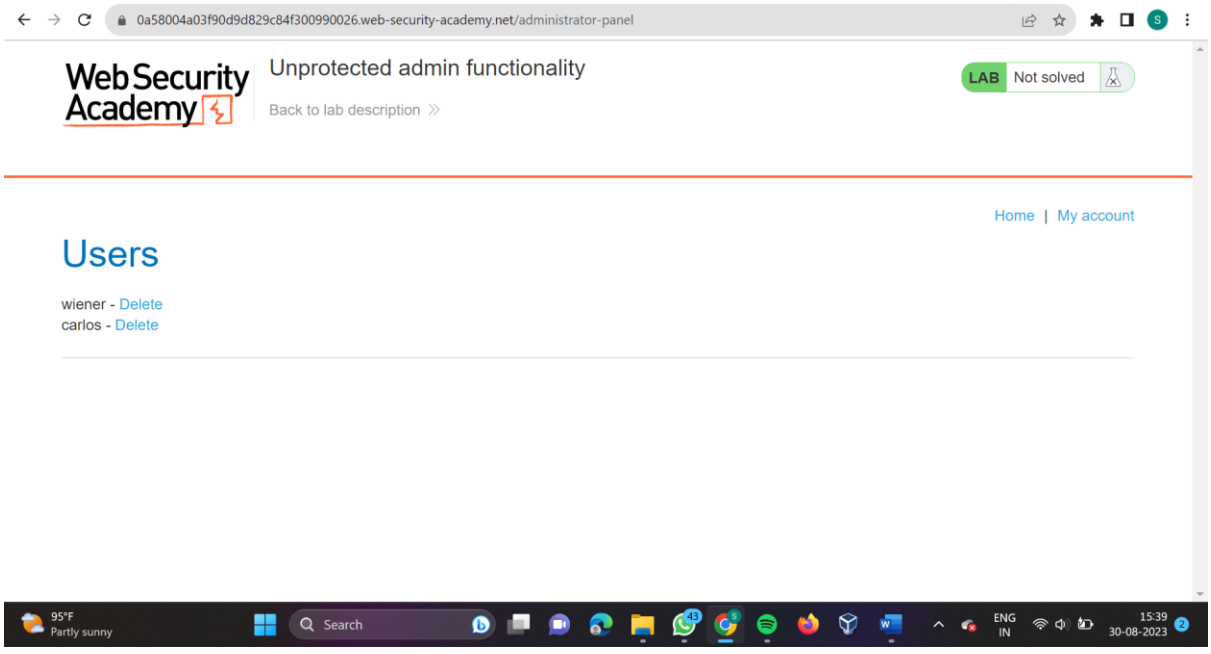


Step2:
Write robot.txt in the URL



Step 3:

This site has vulnerability of broken access control because the Admin panel can be used using .txt in the URL



We can access admin panel by adding administrator-panel in the URL

2. CWE: CWE-261: Weak Encoding for password

OSWAP CATEGORY: A02:2021- Cryptographic Failures

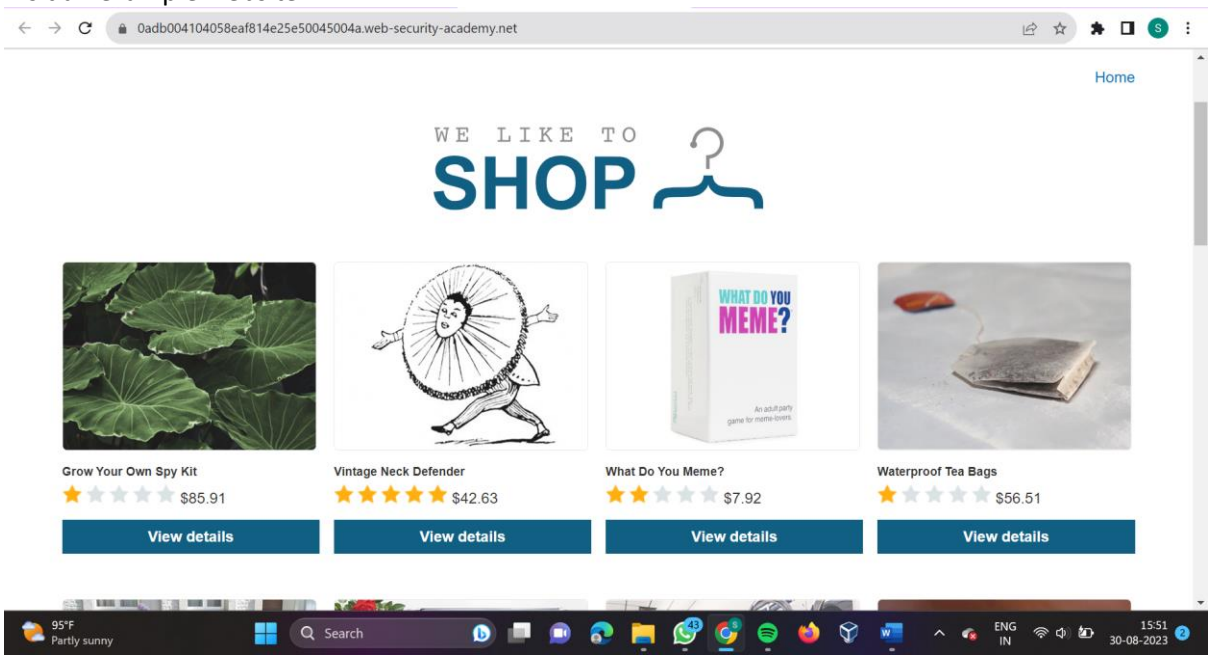
DESCRIPTION: Obscuring a password with a trivial encoding does not protect the password.

BUSINESS IMPACT: Password management issues occur when a password is stored in plaintext in an application's properties or configuration file. A programmer can attempt to remedy the password

management problem by obscuring the password with an encoding function, such as base 64 encoding, but this effort does not adequately protect the password.

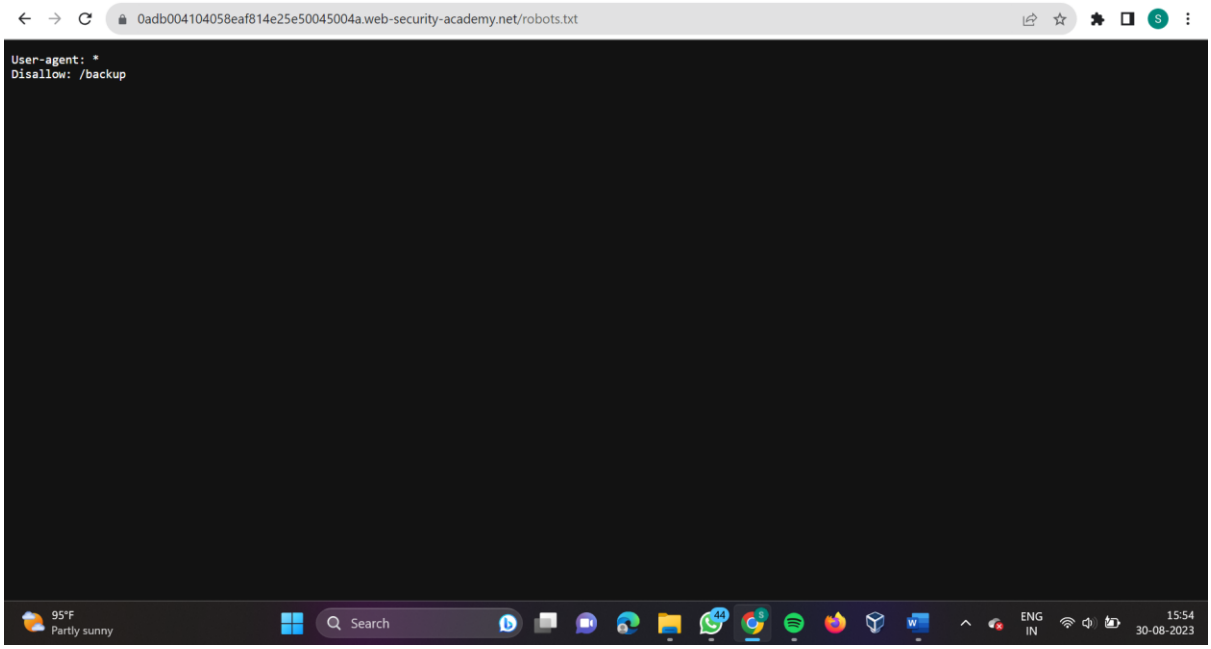
Step 1:

Visit an example website



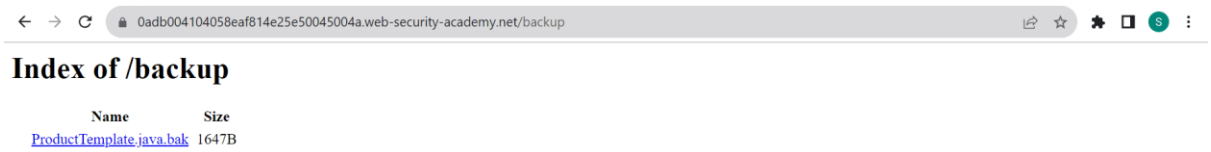
Step 2:

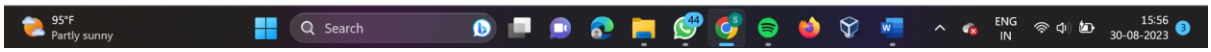
Write robot.txt in the URL. Upon adding this to URL we get the disallowed link.



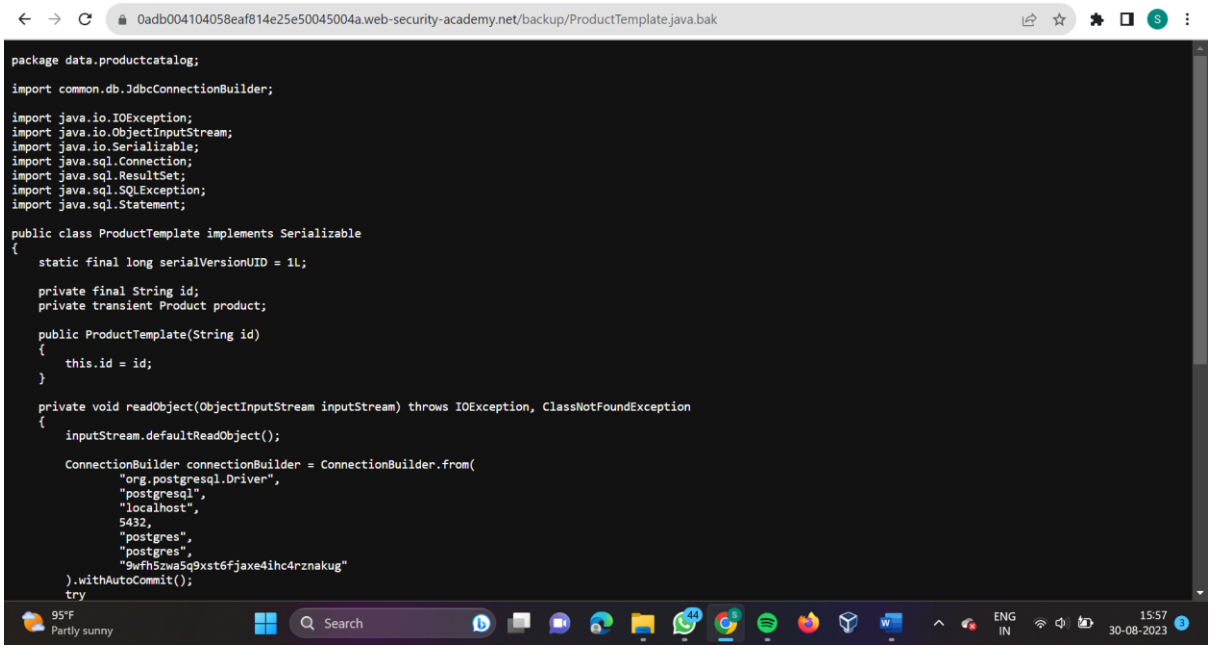
Step 3:

Adding the disallowed link to the URL





Open this file to get the decrypted password for the backup storage of the website



Thus, this website has Cryptographic failures vulnerability as the password was not encrypted before sorting.

3. CWE: CWE-917: Improper Neutralization od Special Elements used in an Expression Language Statement ('Expression Language Injection')

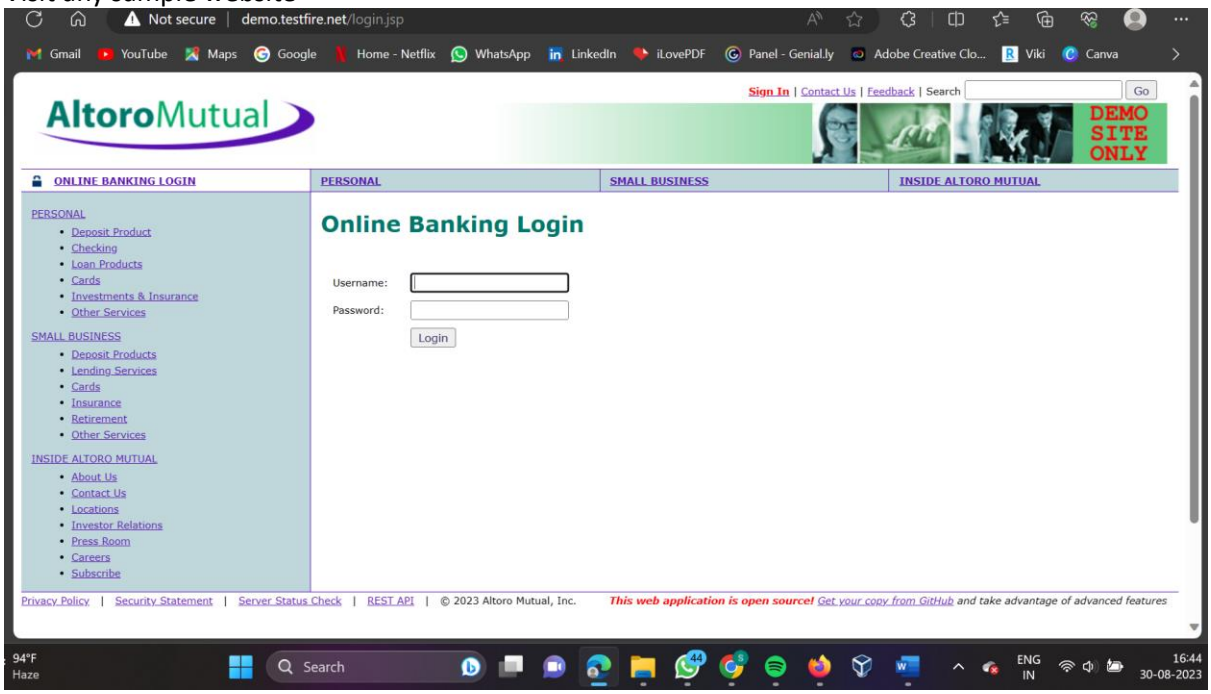
OSWAP CATEGORY: A03:2021- Injection

DESCRIPTION: The product constructs all or part of an expression language (EL) statement in a framework such as a Java Server Page (JSP) using externally-influenced input from an upstream component, but it does not neutralize or incorrectly neutralizes special elements that could modify the intended EL statement before it is executed.

BUSINESS IMPACT: Frameworks such as Java Server Page (JSP) allow a developer to insert executable expressions within otherwise-static content. When the developer is not aware of the executable nature of these expressions and/or does not disable them, then if an attacker can inject expressions, this could lead to code execution or other unexpected behaviors.

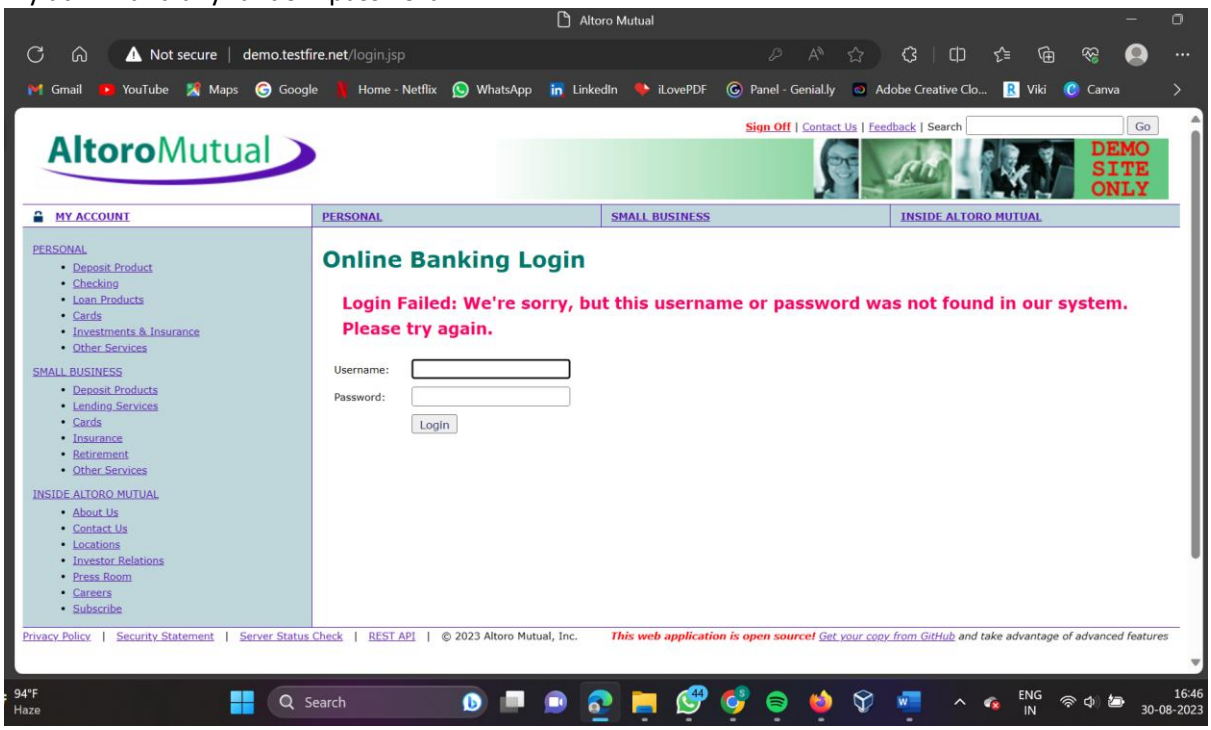
Step 1:

Visit any sample website



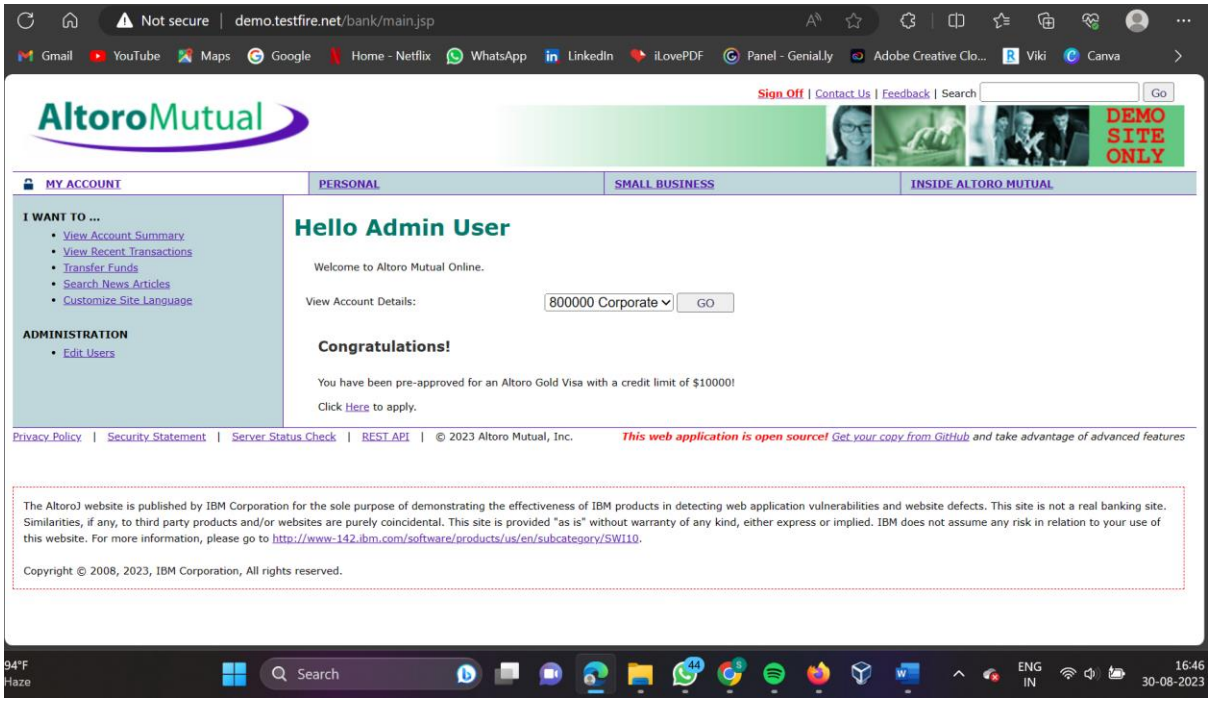
Step 2:

Try admin and any random password



Step 3:

Try username as admin and password also as admin



As you can see login is successful.
Thus, this website has Injection vulnerability.

4. CWE: CWE-501: Trust Boundary Violation

OSWAP CATEGORY: A04:2021- Insecure Design

DESCRIPTION: The product mixes trusted and untrusted data in the same data structure or structured message.

BUSINESS IMPACT: A trust boundary can be thought of as line drawn through a program. On one side of the line, data is untrusted. On the other side of the line, data is assumed to be trustworthy. The purpose of validation logic is to allow data to safely cross the trust boundary - to move from untrusted to trusted. A trust boundary violation occurs when a program blurs the line between what is trusted and what is untrusted. By combining trusted and untrusted data in the same data structure, it becomes easier for programmers to mistakenly trust unvalidated data.

In the above example, as there is a vulnerability and SQL injection can be executed, therefore there is an issue with design. So, we can consider the above website for Insecure vulnerability also.

5. CWE: CWE-1004: Sensitive Cookie Without 'HttpOnly' Flag

OSWAP CATEGORY: A05:2021- Security Misconfiguration

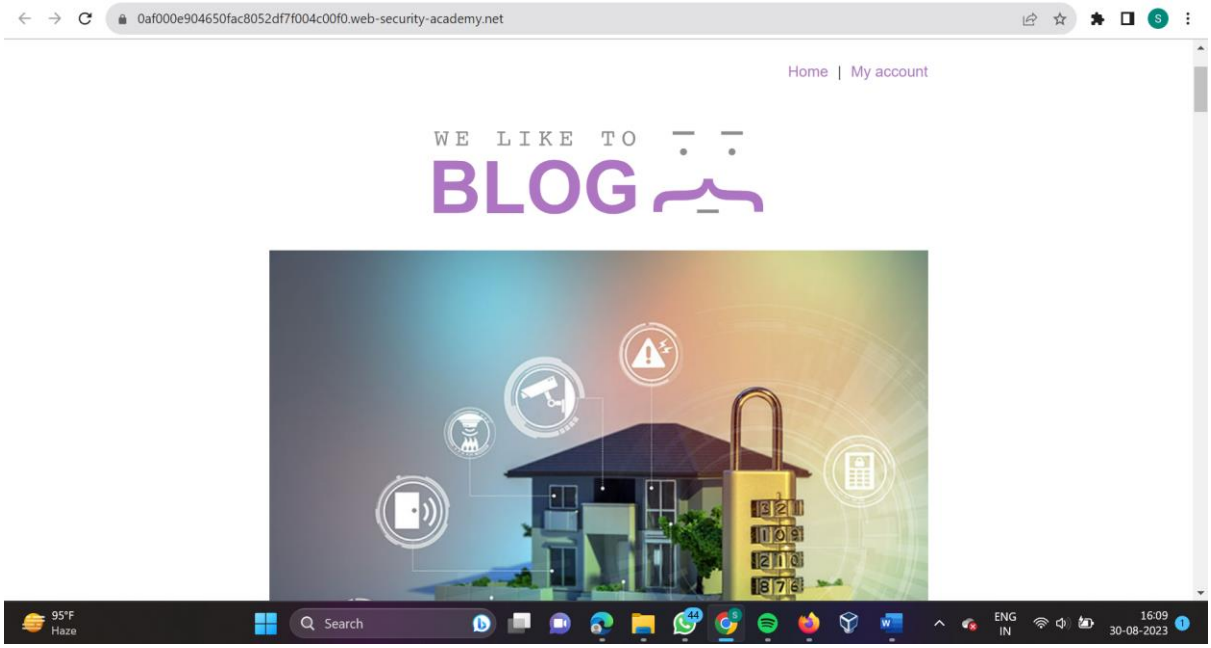
DESCRIPTION: The product uses a cookie to store sensitive information, but the cookie is not marked with the HttpOnly flag.

BUSINESS IMPACT: The HttpOnly flag directs compatible browsers to prevent client-side script from accessing cookies. Including the HttpOnly flag in the Set-Cookie HTTP response header helps mitigate the risk associated with Cross-Site Scripting (XSS) where an attacker's script code might attempt to read the contents of a cookie and exfiltrate information obtained. When set, browsers that

support the flag will not reveal the contents of the cookie to a third party via client-side script executed via XSS.

Step 1:

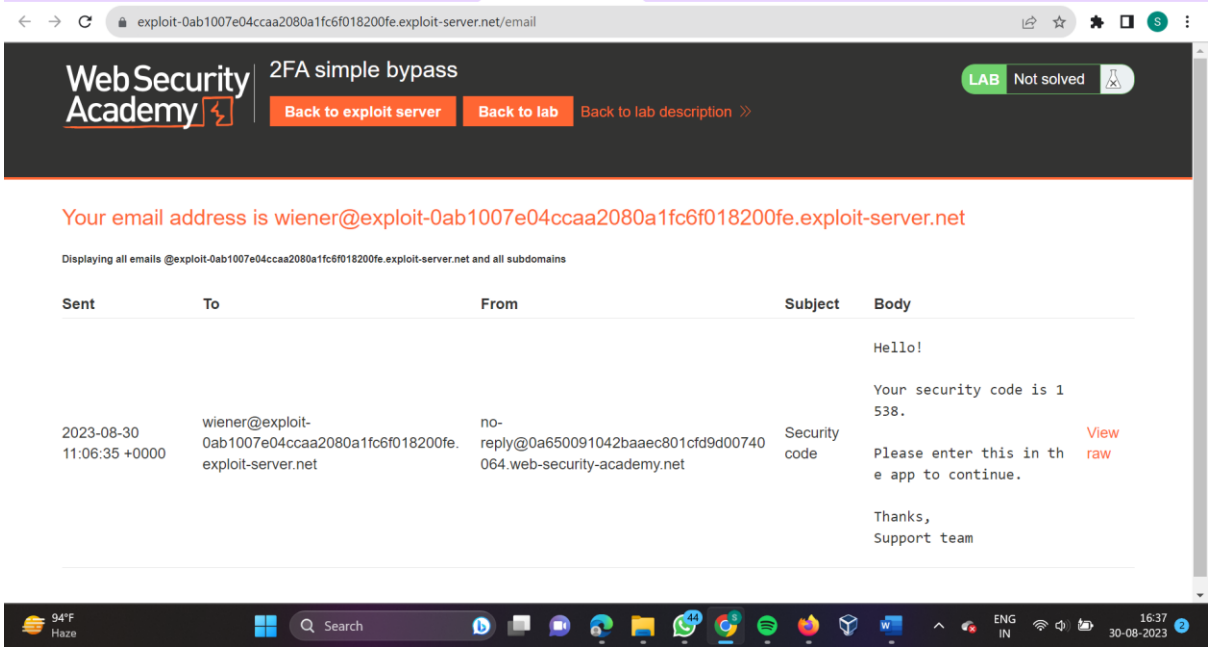
Visit any sample website



Step 2:

Login with the given credentials in the page that is username - wiener and password – peter

Then we get a 2FA verification email. (For this click Email client)



Step 3:

Note down the URL of your account. Then log out and login using Victim's credentials that is username - carlos and password – montoya

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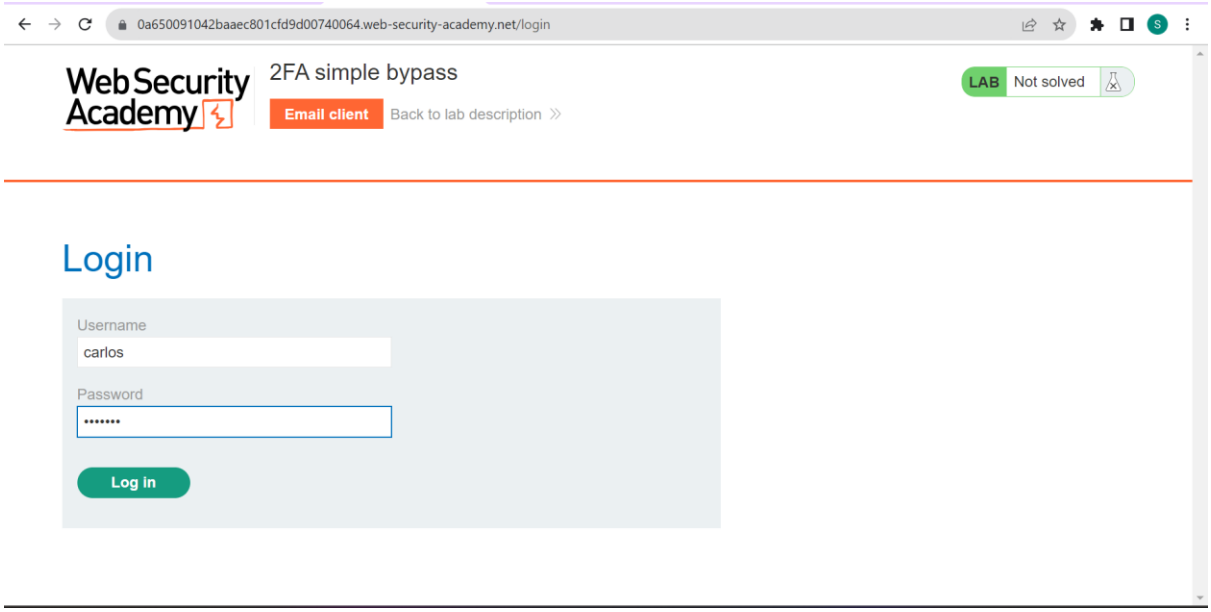
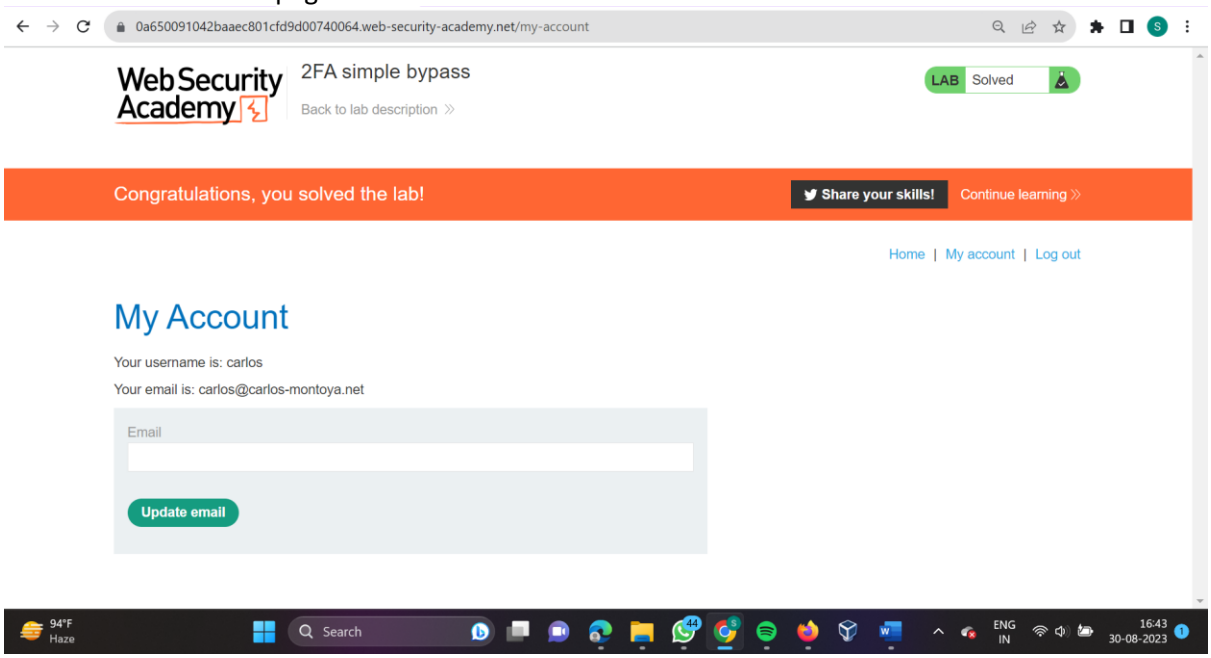


Step 4:

When prompted for the verification code, manually change the URL to navigate to /my-account. The lab is solved when the page loads.



We have logged in successfully

Thus, the sample website has Security Misconfiguration vulnerability.