Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Project title-
"Secure Login & Threat Prevention In Bank Management System"

Project for

INFORMATION SECURITY MANAGEMENT

(BCSE354E)

Submitted by

Swetha S(21BIT0678),

Shivani K(21BIT0681),

Kaliraj A(21BIT0687),

Jumana Begum M(21BIT0694),

Shabavudeen M(21BIT0699),

Nishyanth Nandagopal(21BIT0160)

Submitted to

PROF MOHANA PRIYA P

Abstract

This project aims to enhance the security of a bank management website by implementing strong password policies, encrypted passwords, and additional authentication measures. These measures help mitigate the risks of brute force attacks, SQL injection, cross-site scripting (XSS), and unauthorized access. The project focuses on improving the security and integrity of sensitive financial data, ensuring a safer online banking experience for users.

Scope

The scope of the project includes implementing strong password policies to prevent brute-force attacks, encrypting passwords using AES-128 for security, preventing SQL injection attacks to avoid unauthorized access to the website, using email-based one-time passwords for secure authentication when users try to modify data, and implementing measures to prevent cross-site scripting (XSS) attacks. These measures are aimed at enhancing the security of the website and protecting sensitive user data from various common security threats.

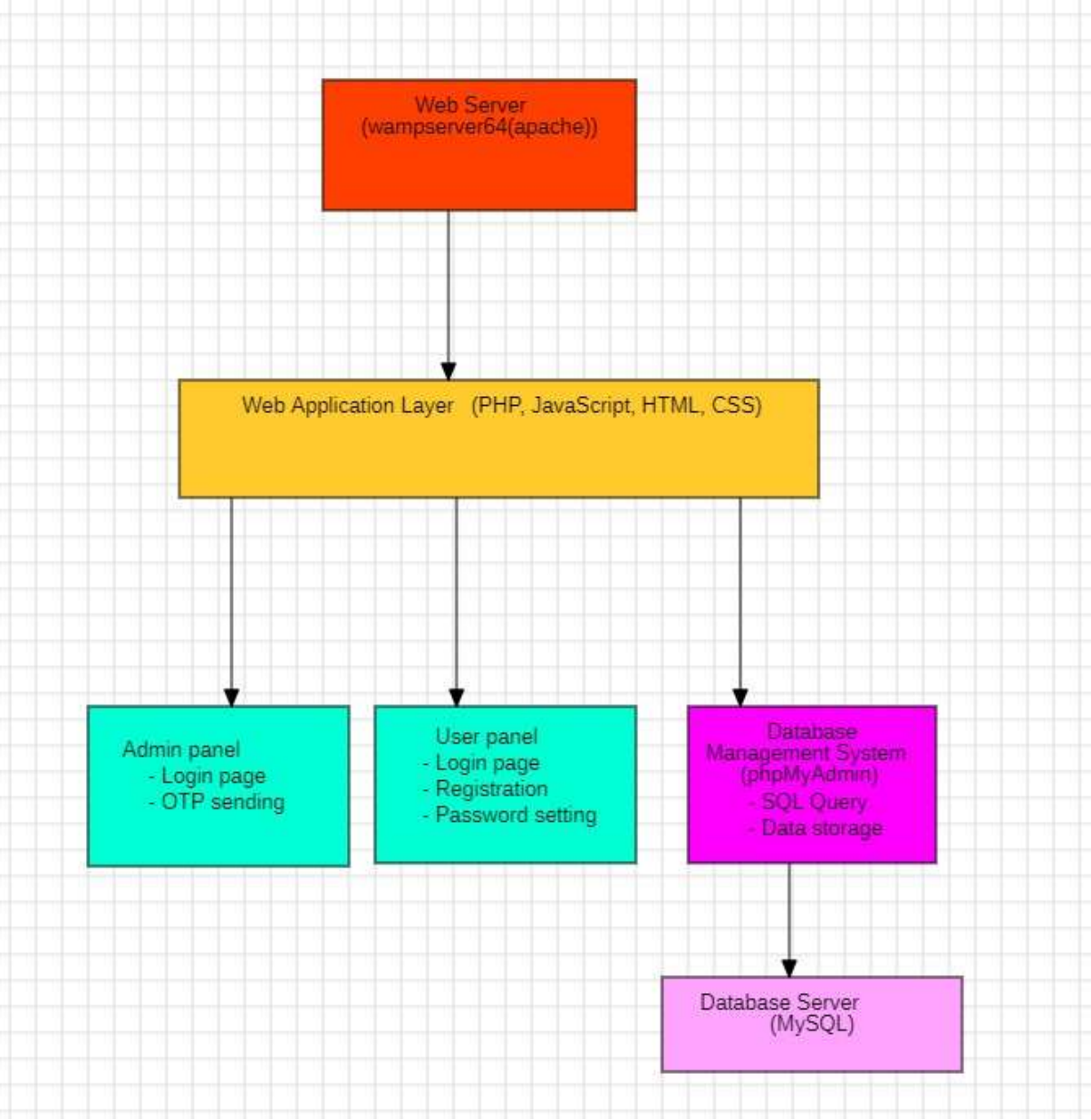
Introduction

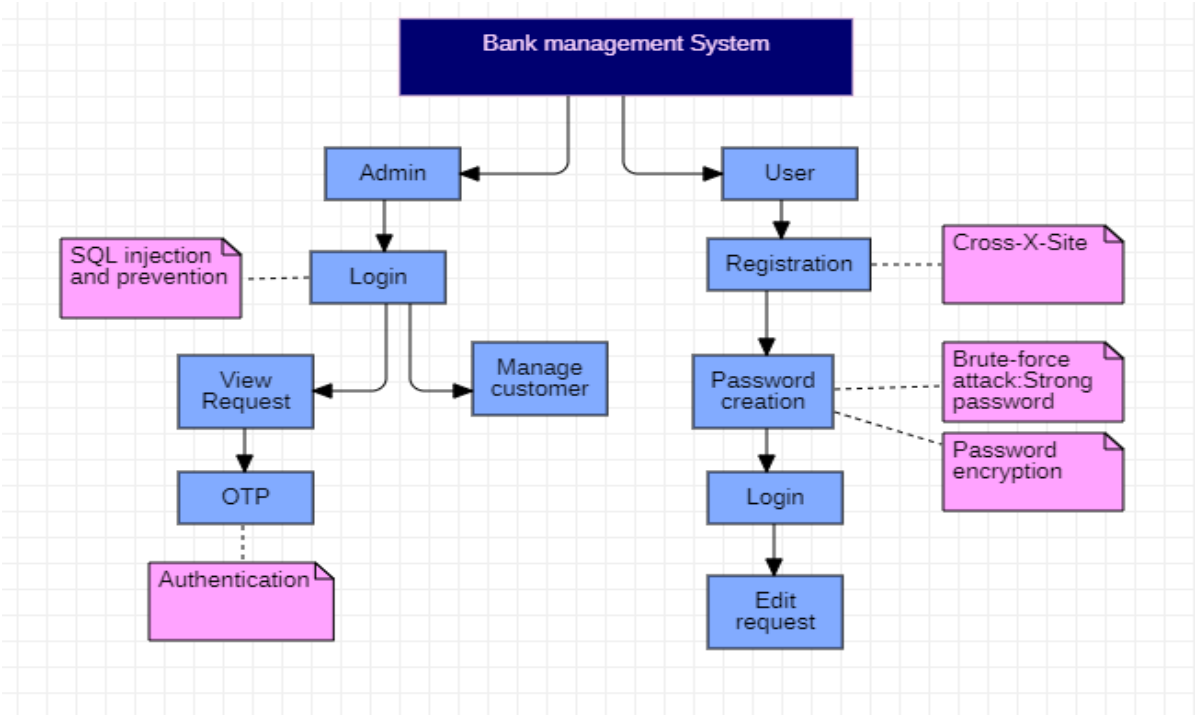
The security of online banking systems is crucial to protect users' financial information from malicious attacks. This project addresses this need by implementing various security measures in a bank management website. By enforcing strong password policies, encrypting passwords using AES-128, and adding additional authentication steps such as email-based one-time passwords (OTP) for modifying user details, the website's security is significantly enhanced. These measures help prevent common security threats like brute force attacks, SQL injection, XSS, and unauthorized access, making the website more secure for users.

Architecture

The architecture of the bank management website is designed to ensure the security and integrity of the system. It consists of several key components, including the user interface, the application logic, the database, and the security features. The user interface allows users to interact with the website, while the application logic handles user requests and processes data. The database stores user information securely, and the security features, such as strong password

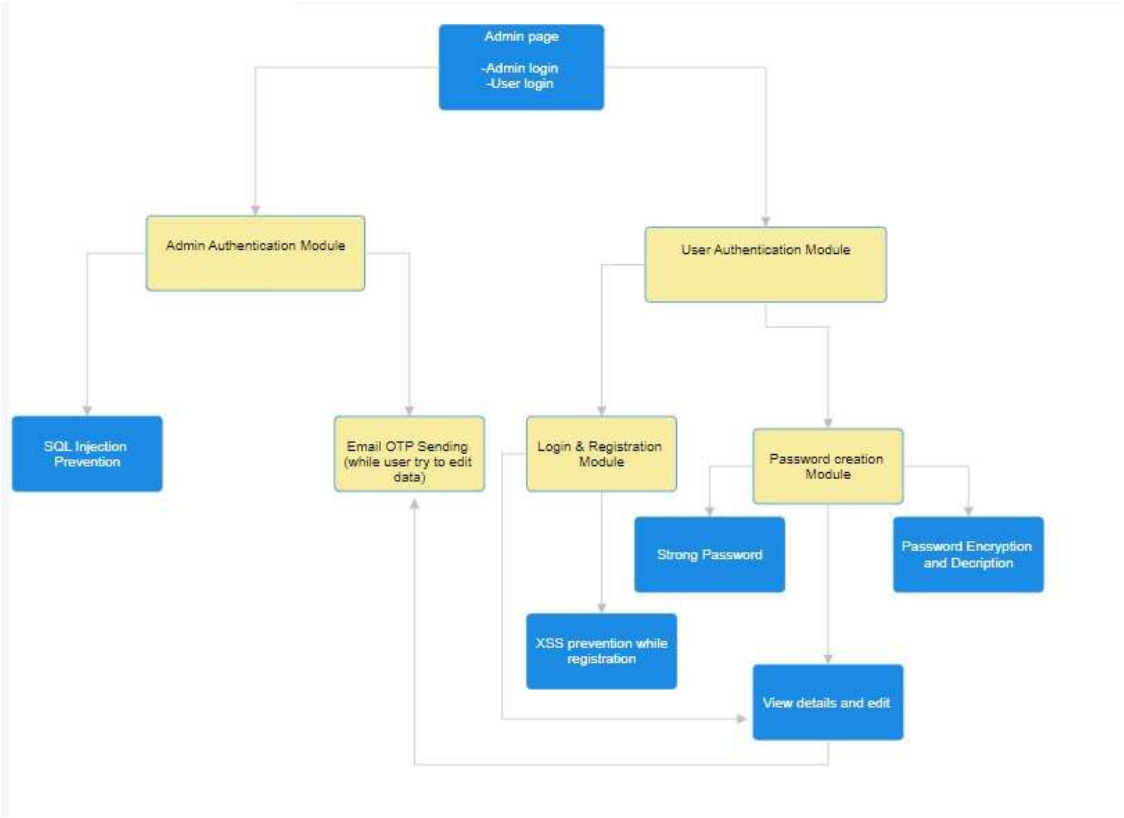
policies and encryption, protect this data from unauthorized access. The architecture is designed to be robust and scalable, ensuring the website can handle a large number of users securely.





Modules

The bank management website is divided into several modules, each responsible for a specific functionality. The modules include the user authentication module, which handles user login and registration, the password management module, which enforces strong password policies and encrypts passwords, the data modification module, which adds additional authentication measures for modifying user details, and the security module, which protects the website from common security threats. Each module works together to ensure the security and integrity of the website's data and functionality.



Experimental setup

- Database management system (DBMS) software -WAMPSERVER (phpmyadmin)
- Programming language - PHP,JAVASCRIPT,HTML,CSS.
- Database Management – MySQL
- Integrated Development Environment (IDE) for coding and testing - Visual Studio Code

Home page : It contains admin and user login link

Admin login page :While login we added SQL injection prevention technique. This page also responsible for sending OTP to user's email when user request to edit their data. Session hijacking is prevented.

User login page : While login we added sql injection prevention technique . This page also contains registration option if not registered. After registration password setting will be done during this we added strong password requirements . .Additional to this , we added authentication like permission request from admin. In this User login page we included the Cross Site Scripting prevention technique to prevent the attack which is affect the website.

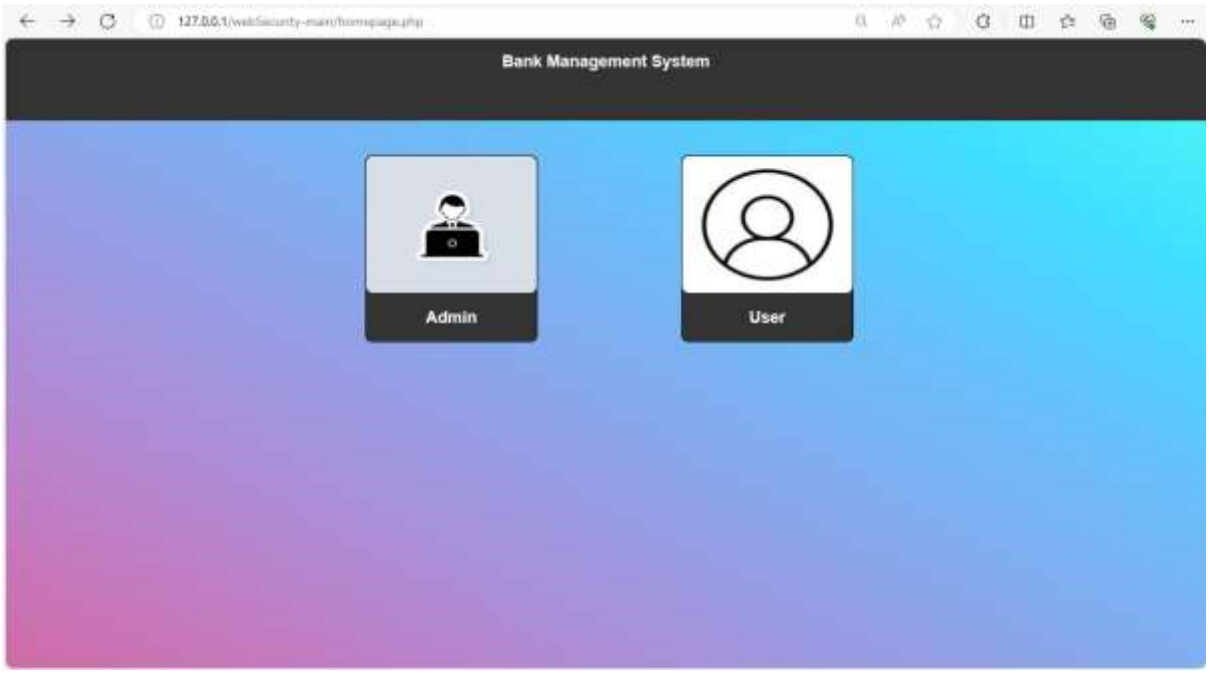
And also in user login system, we included the technique which encrypt passwords before storing them in the database to enhance security. This page also contains the prevention technique from the session hijacking attack is a type of attack where an attacker takes the user’s active session to gain unauthorized access to a web Application.

Novelty

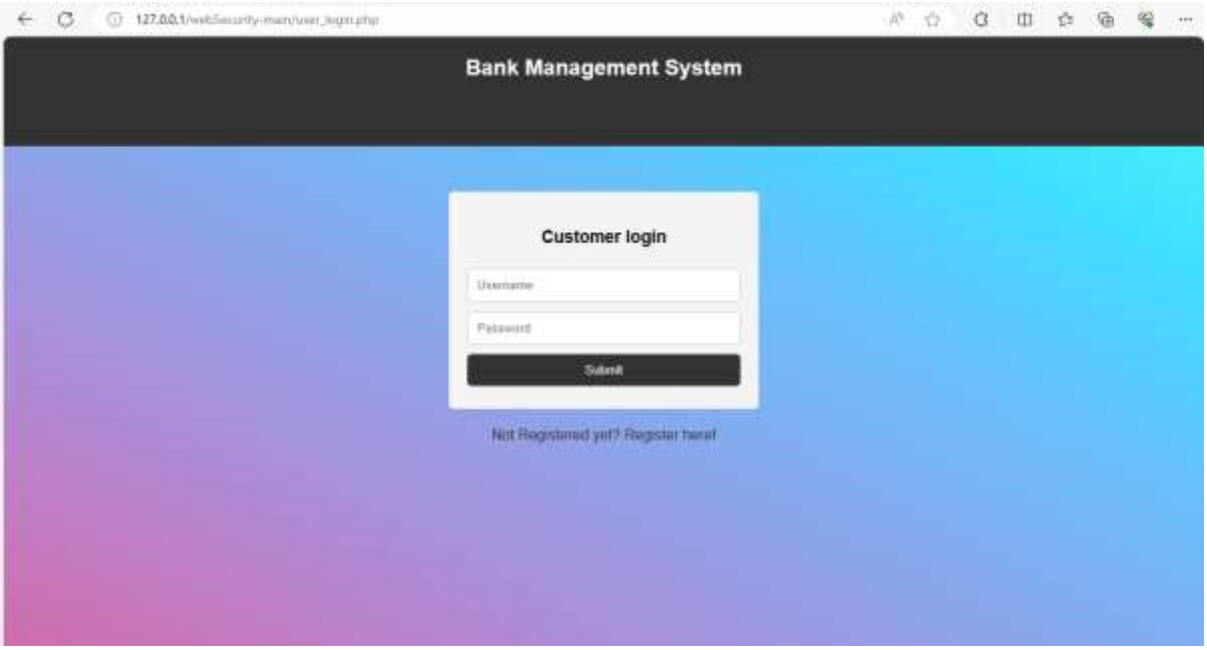
The novelty of this project lies in its comprehensive approach to security. By combining strong password policies, encrypted passwords, additional authentication measures, and protection against common security threats, the project provides a robust and secure solution for online banking. The project's focus on enhancing the security and integrity of sensitive financial data sets it apart from other similar projects, making it a valuable contribution to the field of cybersecurity.

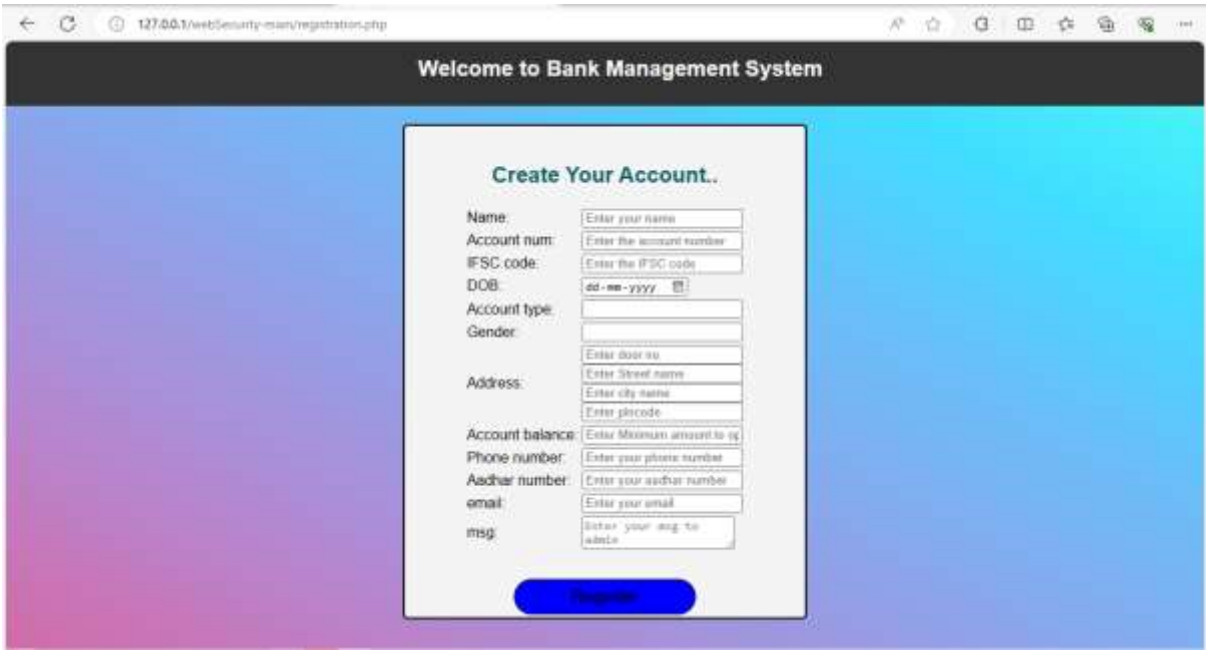
Implementation

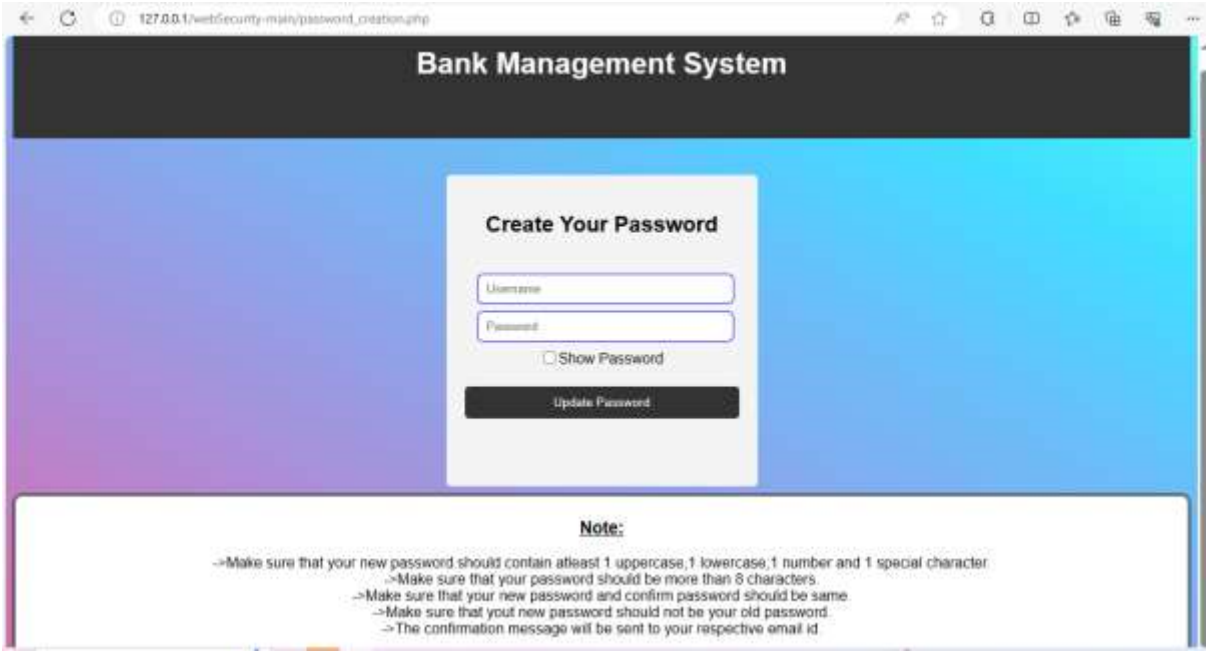
HOME PAGE:

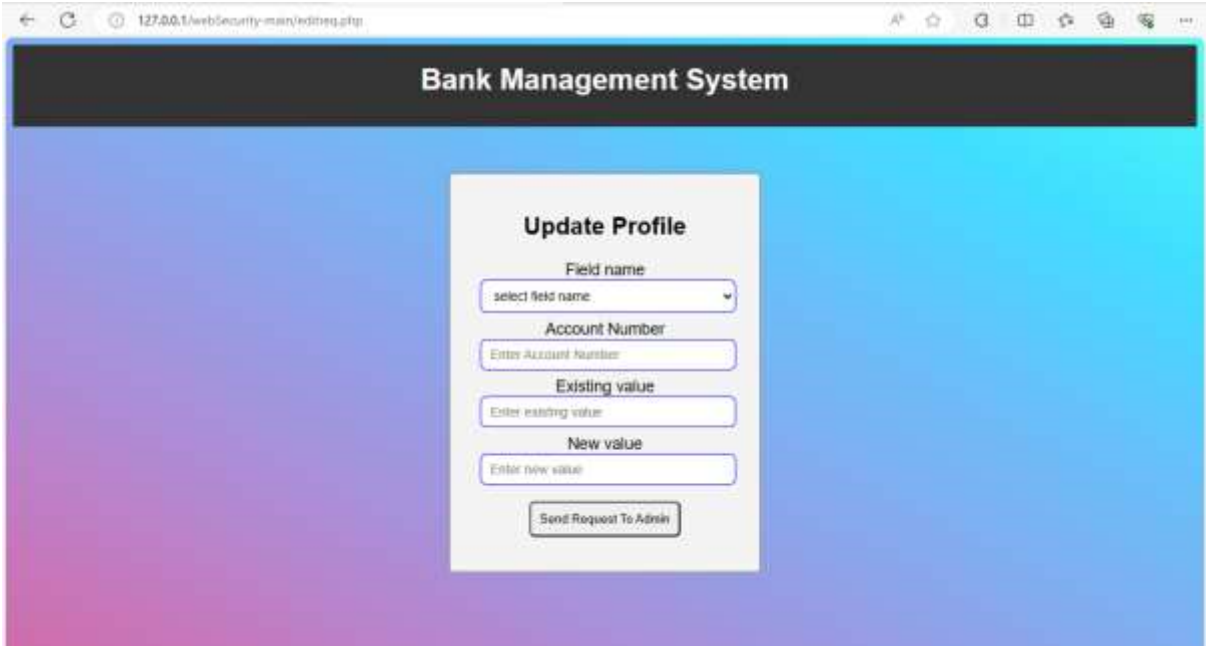


CUSTOMER PAGE:

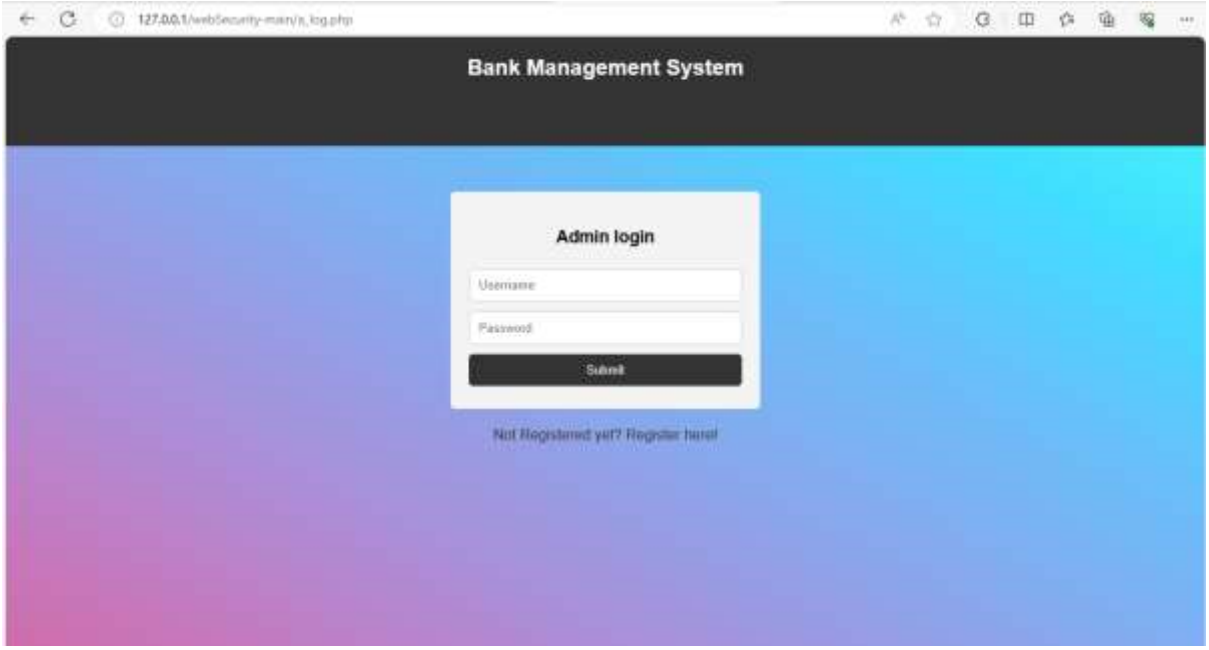


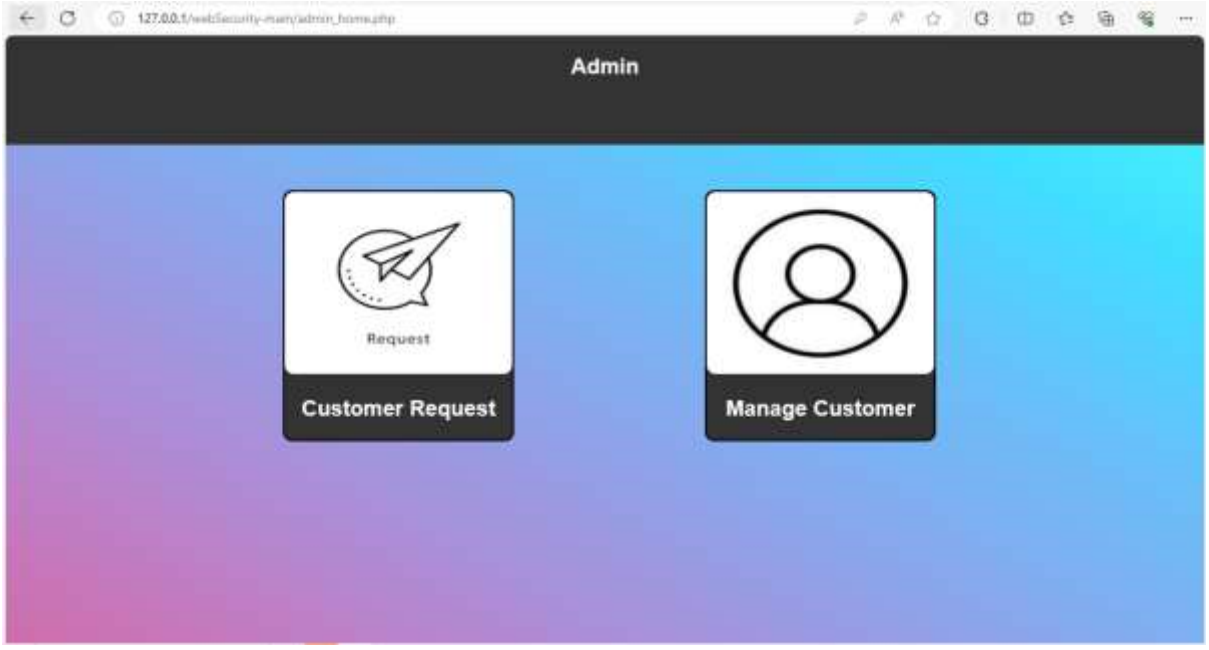


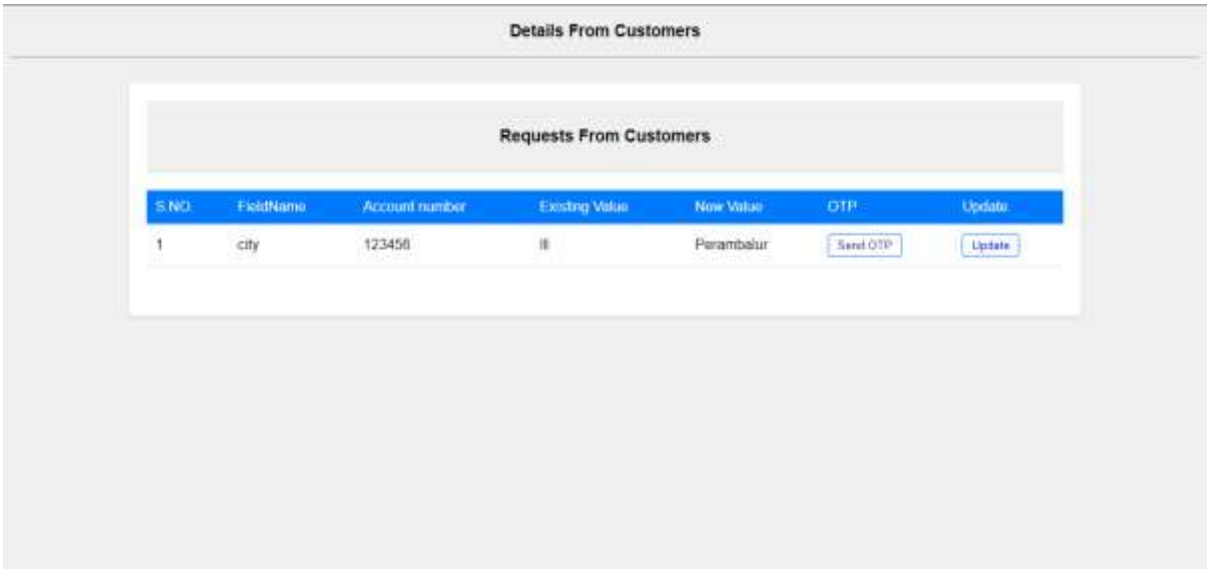

127.0.0.1/webSecurity-main/password_creation.php
Bank Management System
Create Your Password
Username
Password
Show Password
Update Password
Note:
->Make sure that your new password should contain atleast 1 uppercase,1 lowercase,1 number and 1 special character.
->Make sure that your password should be more than 8 characters.
->Make sure that your new password and confirm password should be same.
->Make sure that yout new password should not be your old password.
->The confirmation message will be sent to your respective email id


127.0.0.1/webSecurity-main/editreq.php
Bank Management System
Update Profile
Field name
select field name
Account Number
Enter Account Number
Existing value
Enter existing value
New value
Enter new value
Send Request To Admin

ADMIN PAGE:

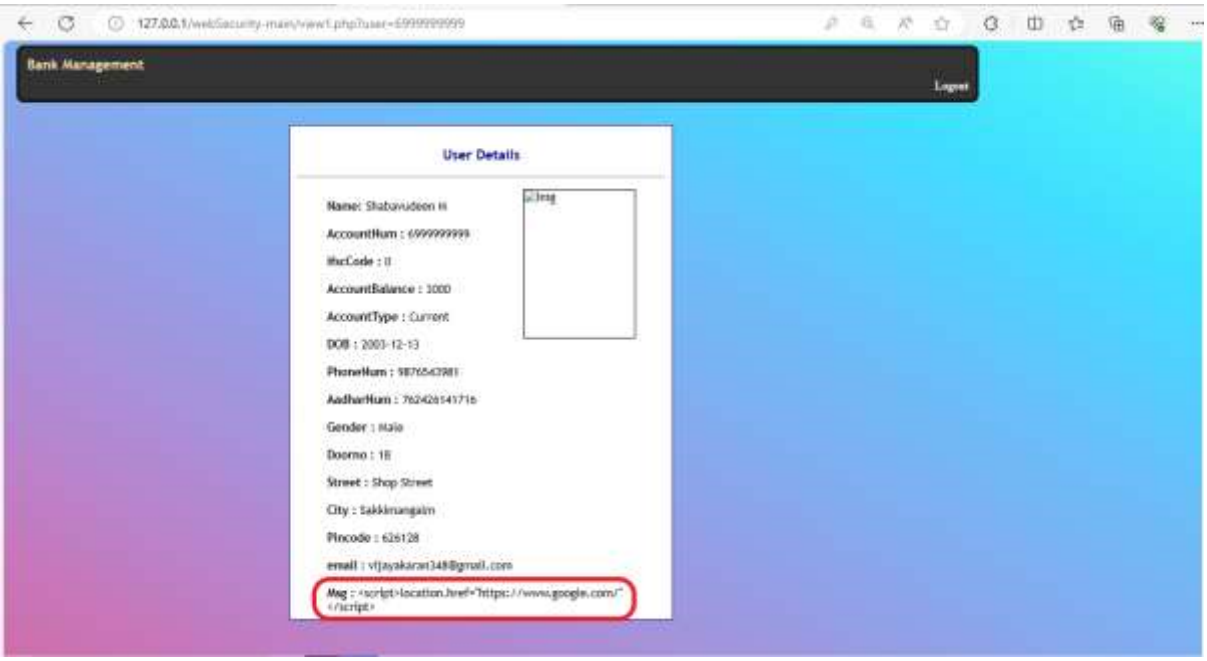

Bank Management System
Admin login
Username
Password
Submit
Not Registered yet? Register here!


Admin
Request
Customer Request
Manage Customer

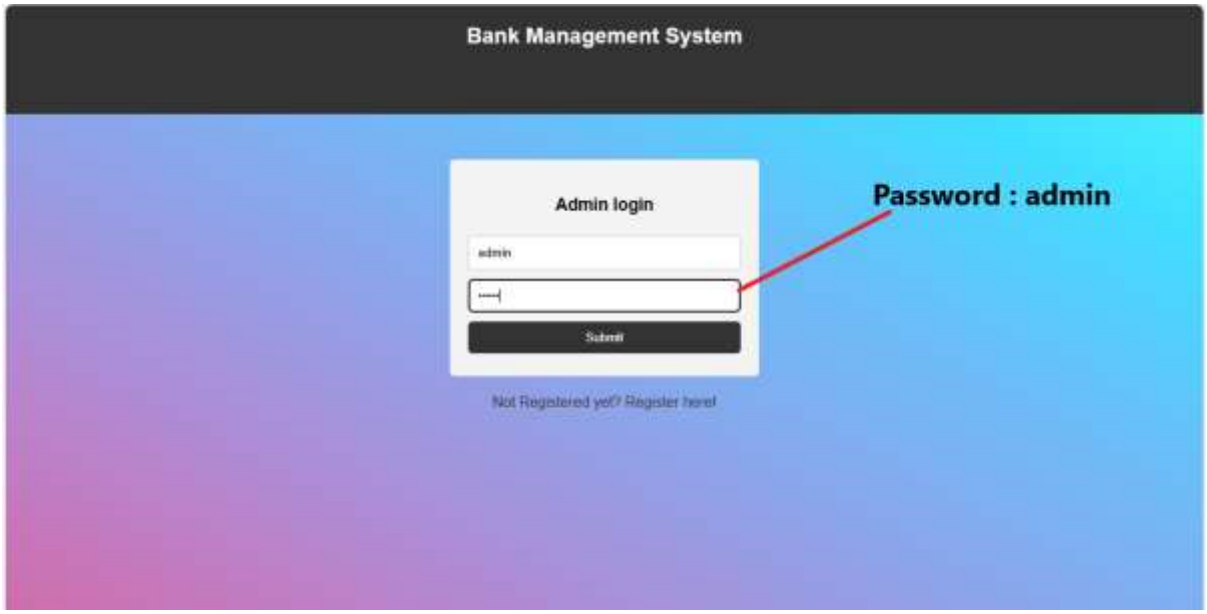


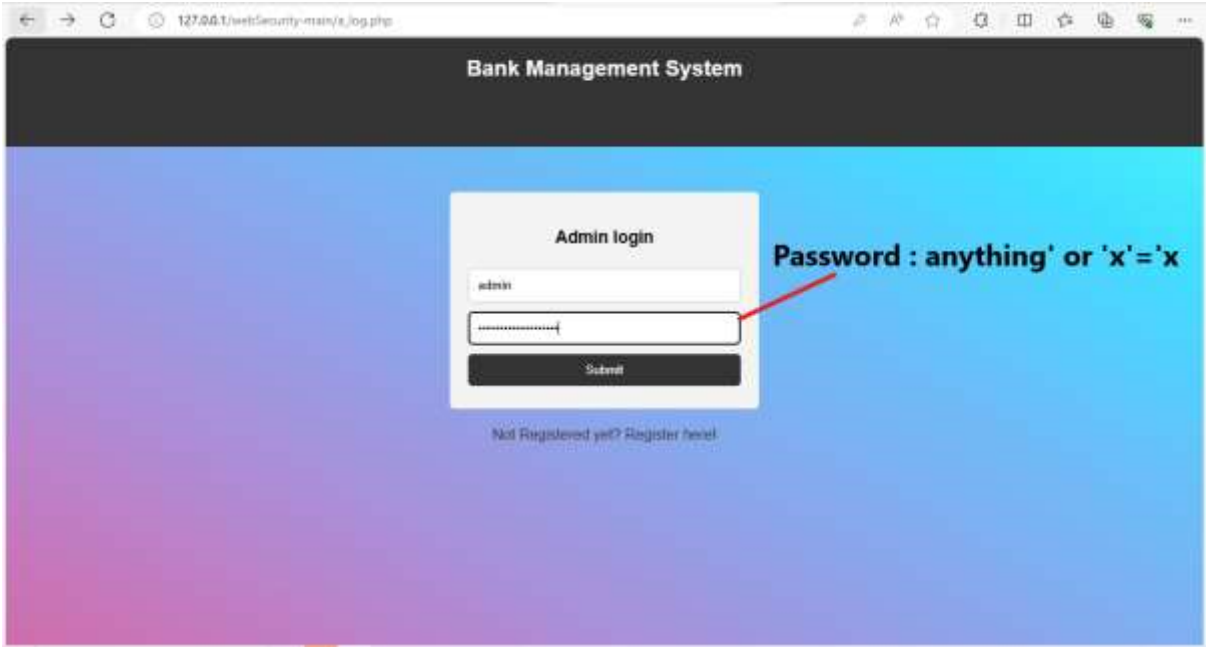
Testing and Screenshots

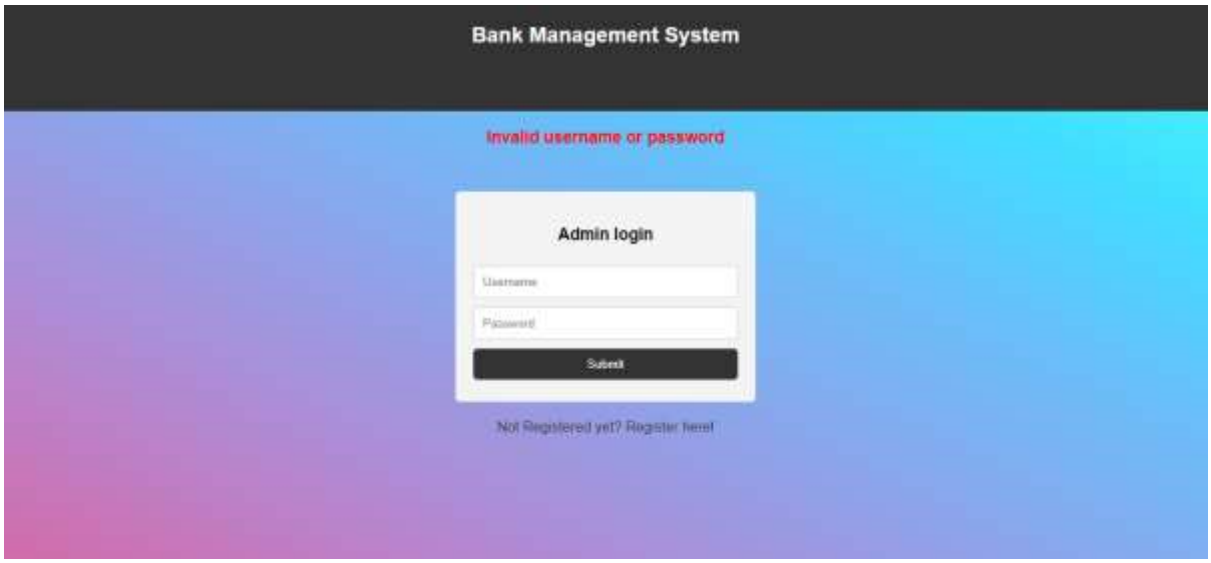
XSS PREVENTION:



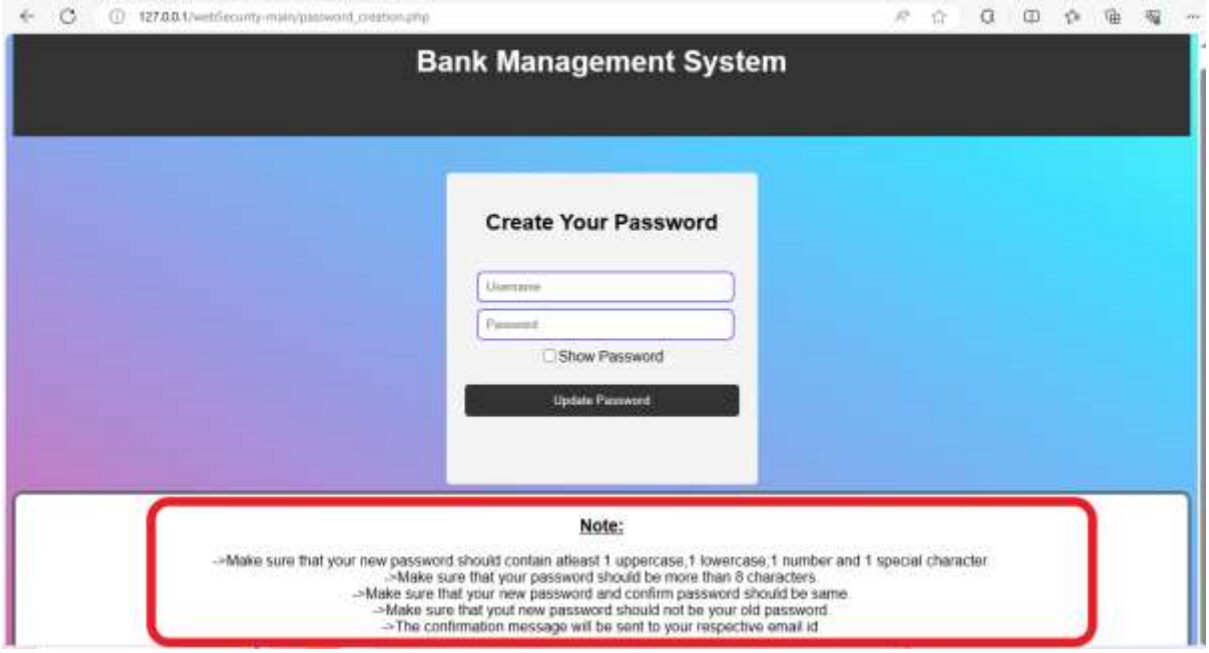
SQL INJECTION PREVENTION:

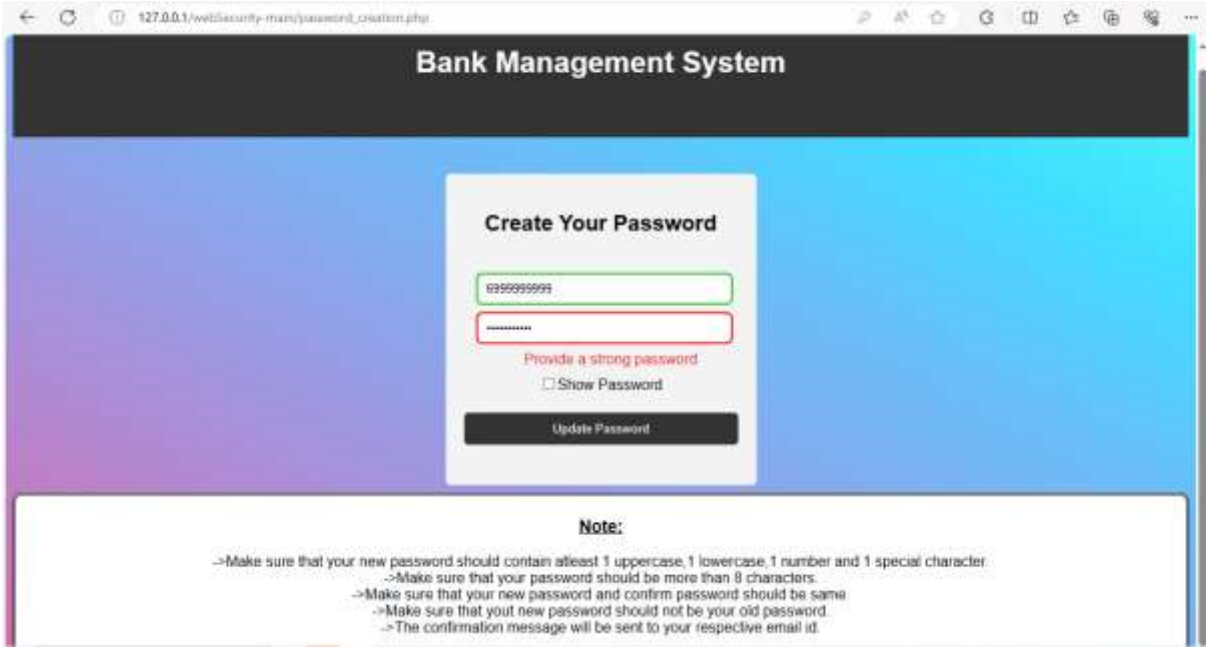

Bank Management System
Admin login
admin
Submit
Not Registered yet? Register here!
Password : admin


127.0.0.1/webSecurity-main/a_log.php
Bank Management System
Admin login
admin
Submit
Not Registered yet? Register here!
Password : anything' or 'x'='x

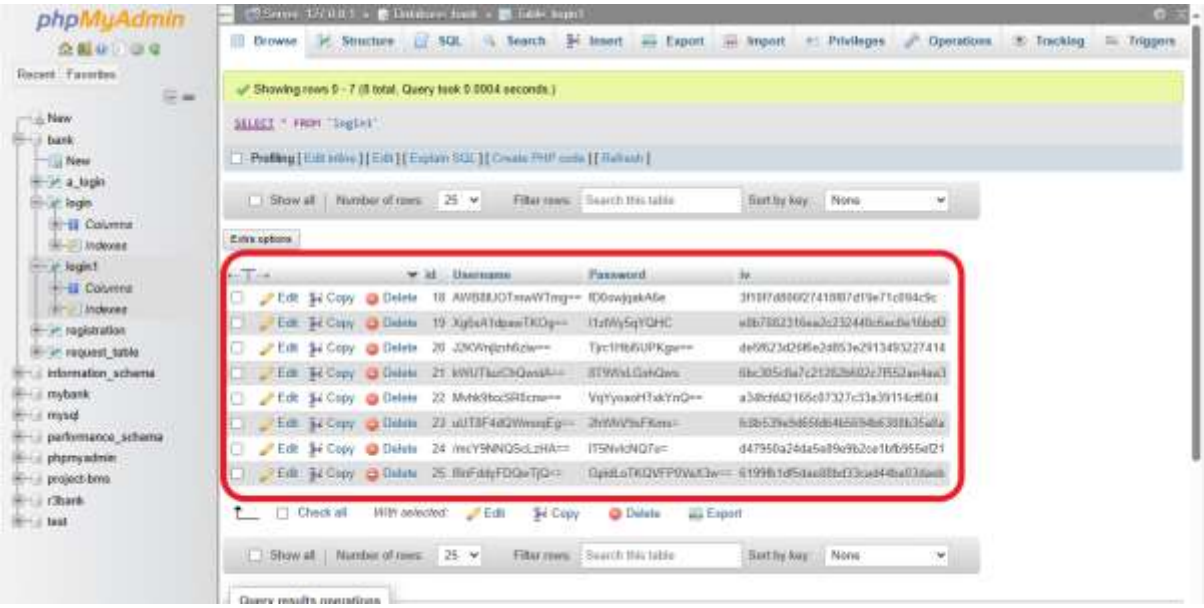

Bank Management System
Invalid username or password
Admin login
Username
Password
Submit
Not Registered yet? Register here!

PASSWORD CREATION:

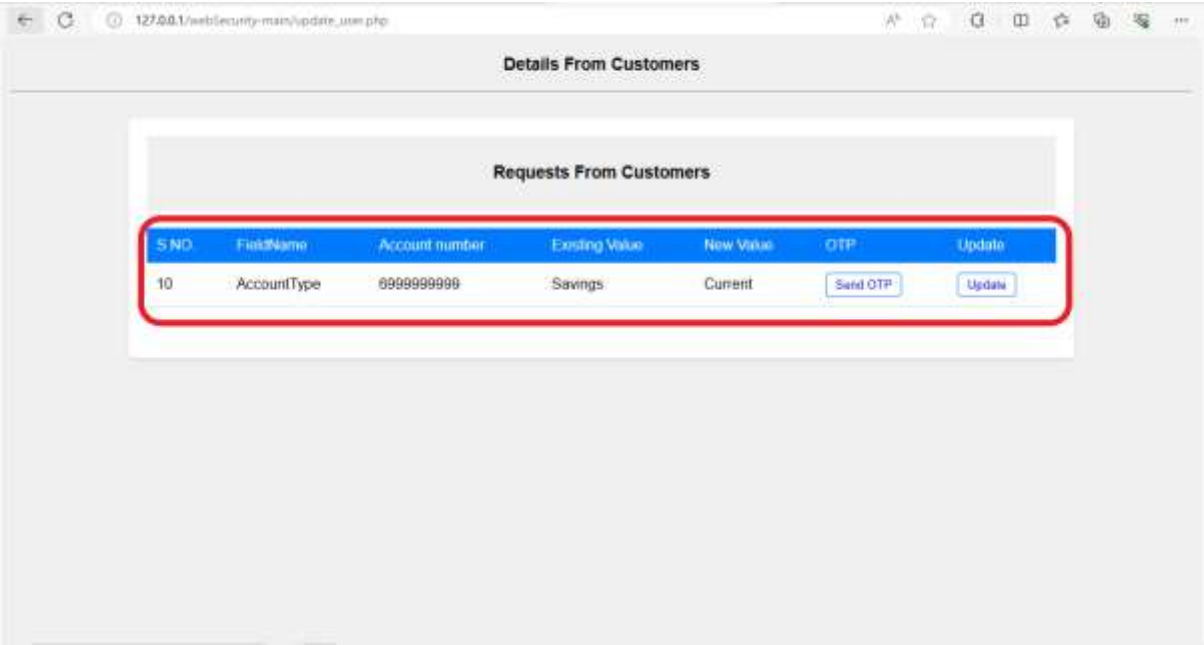


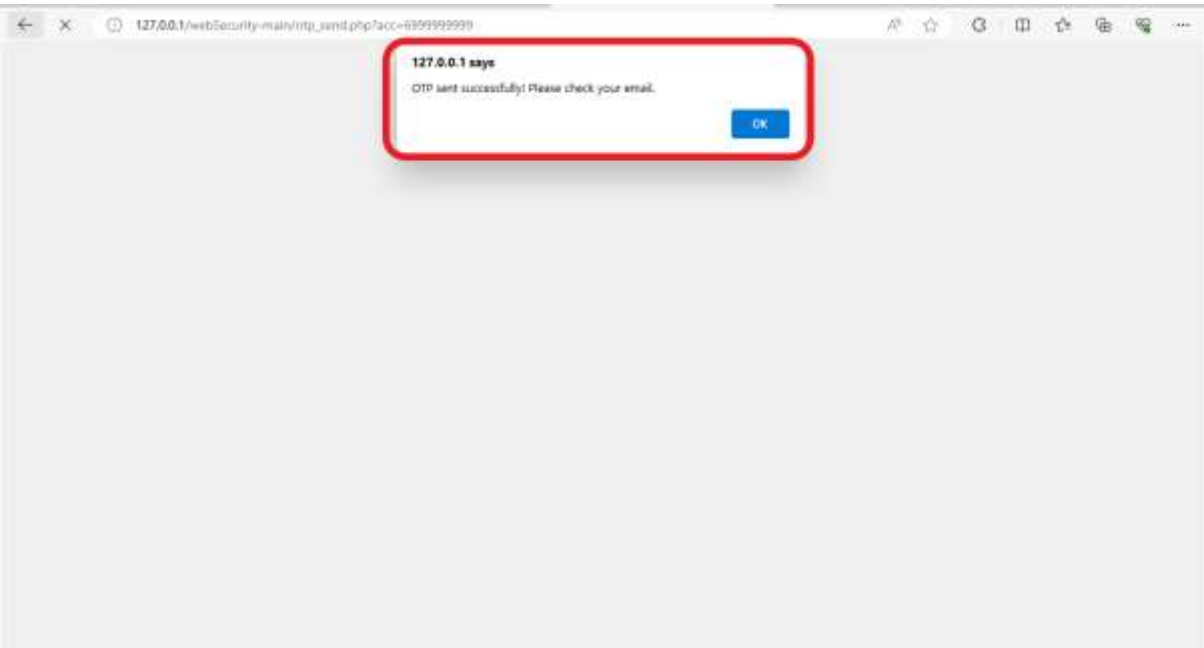


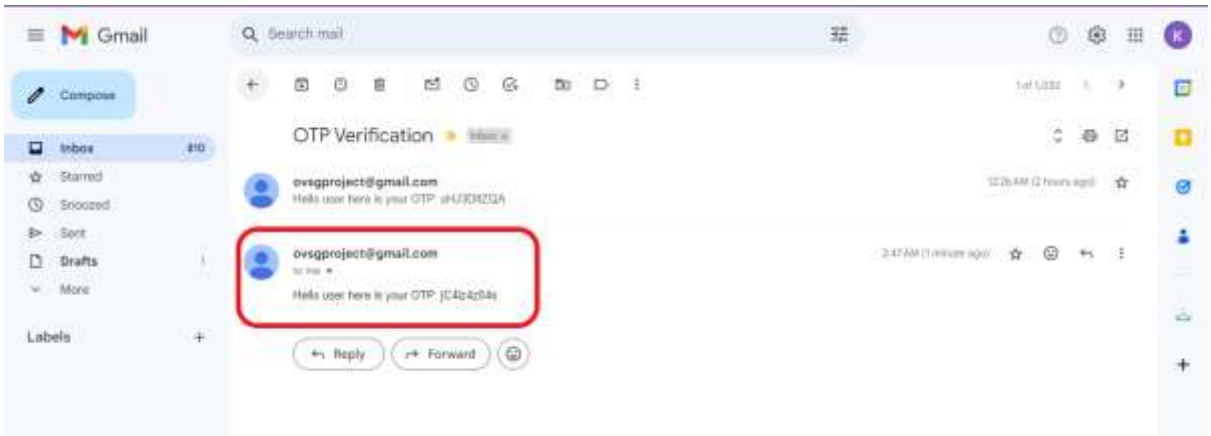
ENRYPTION AND DECRYPTION:

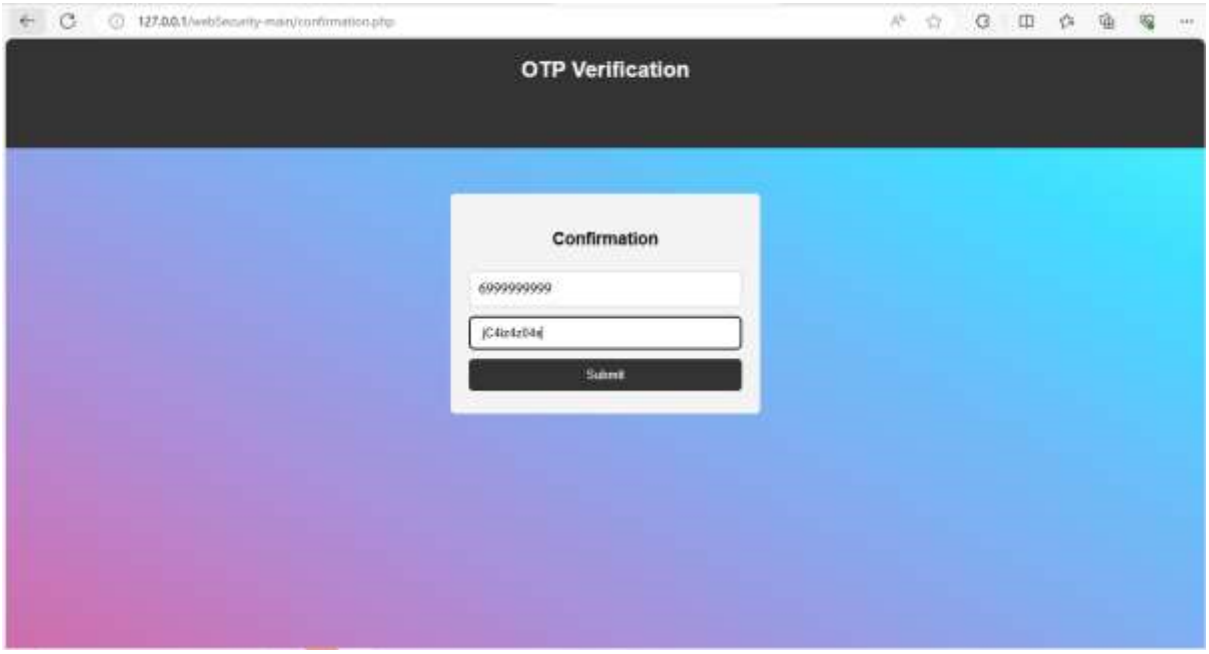


EDIT REQUEST-OTP AUTHENTICATION




127.0.0.1 says
OTP sent successfully! Please check your email.
OK


Gmail
Search mail
Compose
Inbox
Starred
Snoozed
Sent
Drafts
More
Labels
OTP Verification
ovsgproject@gmail.com
ovsgproject@gmail.com
Hello user here is your OTP jC4z4z04s
Reply
Forward


OTP Verification
Confirmation
6999999999
jC4z4z04s
Submit

Conclusion

In conclusion, this project successfully enhances the security of a bank management website by implementing various measures such as strong password policies, encrypted passwords, and additional authentication steps. These measures help protect sensitive financial data from common security threats like brute force attacks, SQL injection, cross-site scripting (XSS), and unauthorized access. By improving the security and integrity of the website, users can have a safer online banking experience. The project's comprehensive approach to security makes it a valuable contribution to the field of information security and cybersecurity.