Cyber Security Internship

Project : Black-Fortress

(Role Based Secure Login System)

Harsh M Parikh

ph400764@gmail.com

1. Introduction

The Black Fortress project is a secure authentication and authorization system designed to provide role-based access control (RBAC) for web applications. It ensures safe user login, protects against unauthorized access, and provides an admin panel for user management.

2. Key Features

- Secure User Registration & Login with password hashing (bcrypt)
- Role-Based Access Control (RBAC) with admin and user roles
- Admin Dashboard to manage users and update roles
- Security Enhancements: Helmet CSP, CORS, rate limiting, account lockouts
- Input Validation & Sanitization using express-validator
- Google reCAPTCHA v3 Integration (optional, to prevent bots)
- Frontend UI with login, registration, user dashboard, and admin dashboard pages

3. Technology Stack

- Backend: Node.js, Express.js
- Database: MongoDB with Mongoose
- Authentication: JWT (HttpOnly cookies), bcrypt
- Frontend: HTML, CSS, Vanilla JavaScript
- Security Middleware: Helmet, CORS, express-rate-limit
- Deployment: Render
- Optional: Google reCAPTCHA v3

4. System Workflow

1. User registers → credentials validated and stored securely
2. User logs in → JWT issued and stored in HttpOnly cookie
3. Access granted based on role:
    - User: Can access user dashboard only
    - Admin: Can manage users, assign/remove roles
4. Logout clears session cookies

5. Project Structure

src/

server.js

middleware/auth.js

models/User.js

routes/auth.js

routes/admin.js

routes/me.js

public/

index.html

login.html / login.js

register.html / register.js

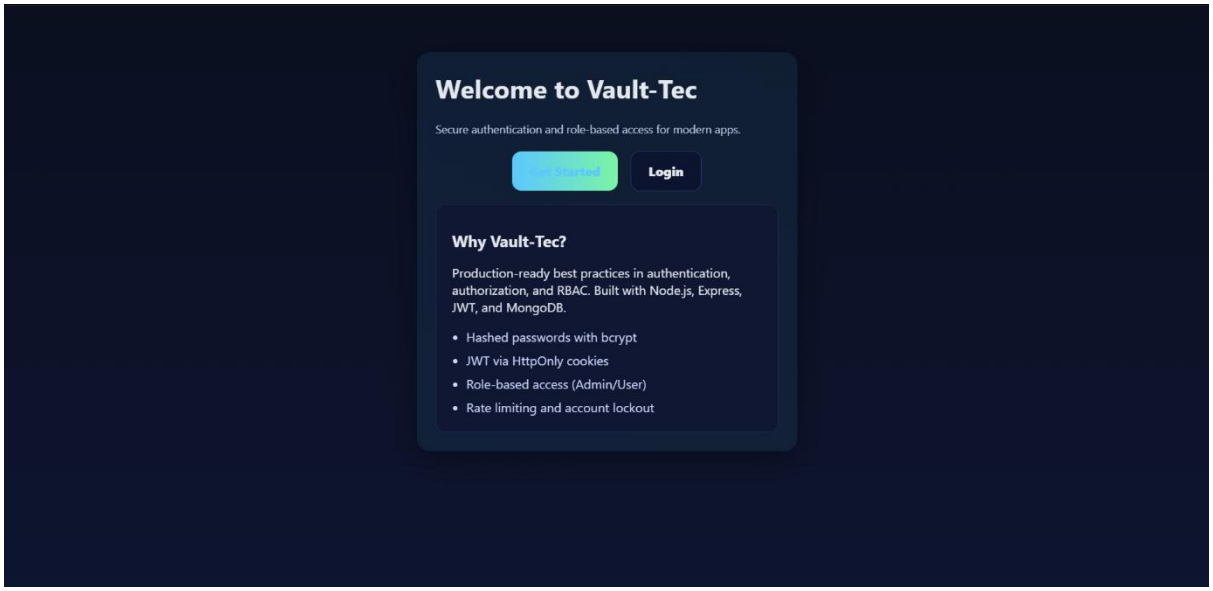
user.html / user.js

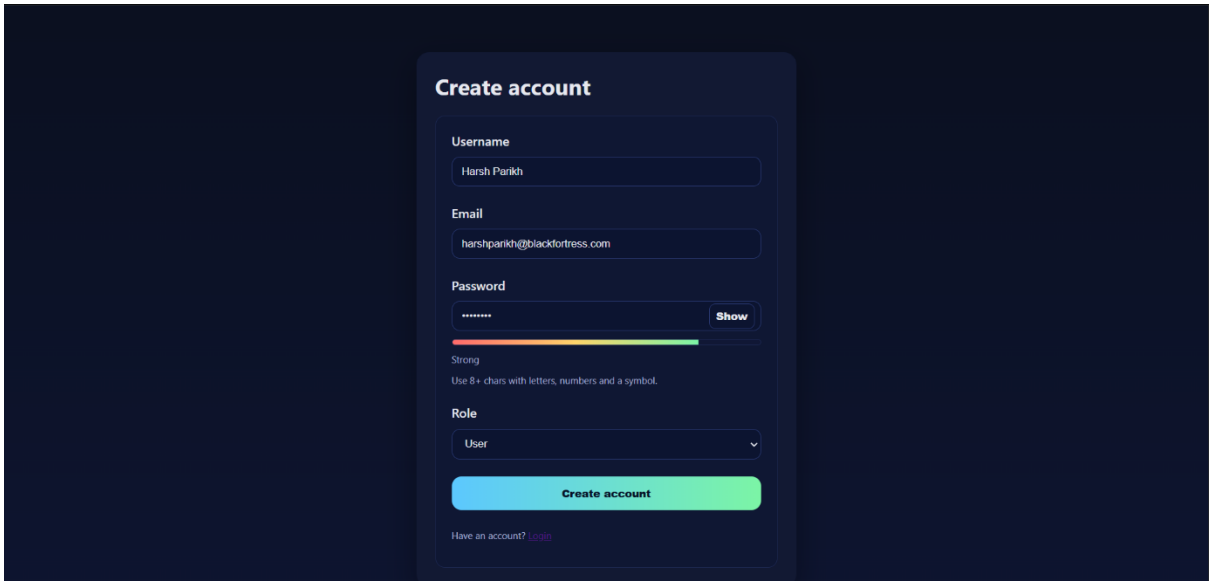
admin.html / admin.js

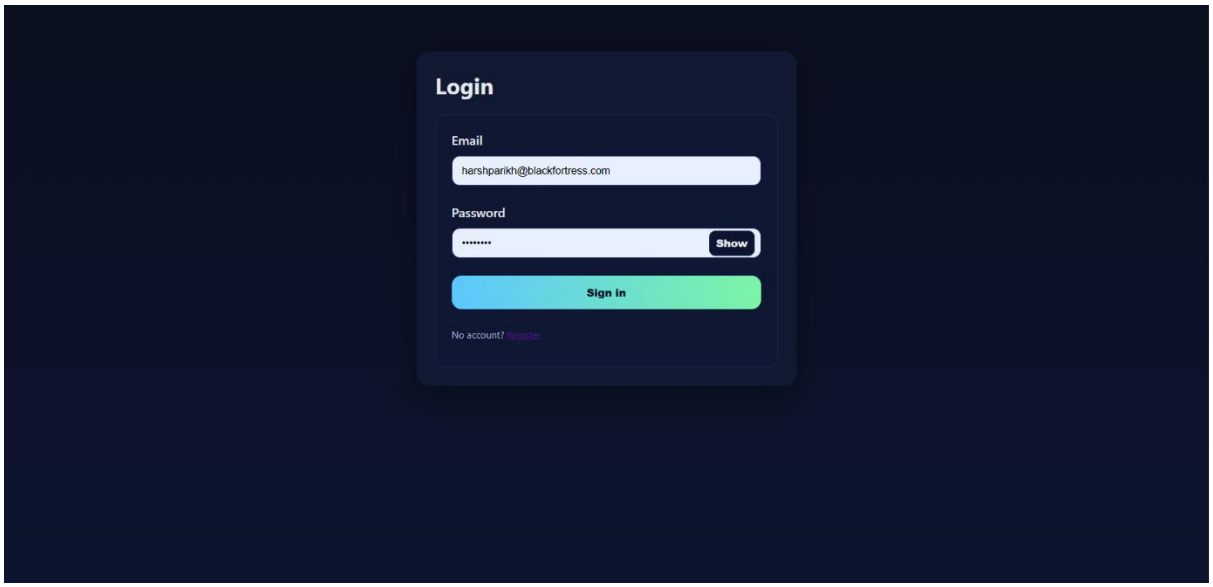
styles.css

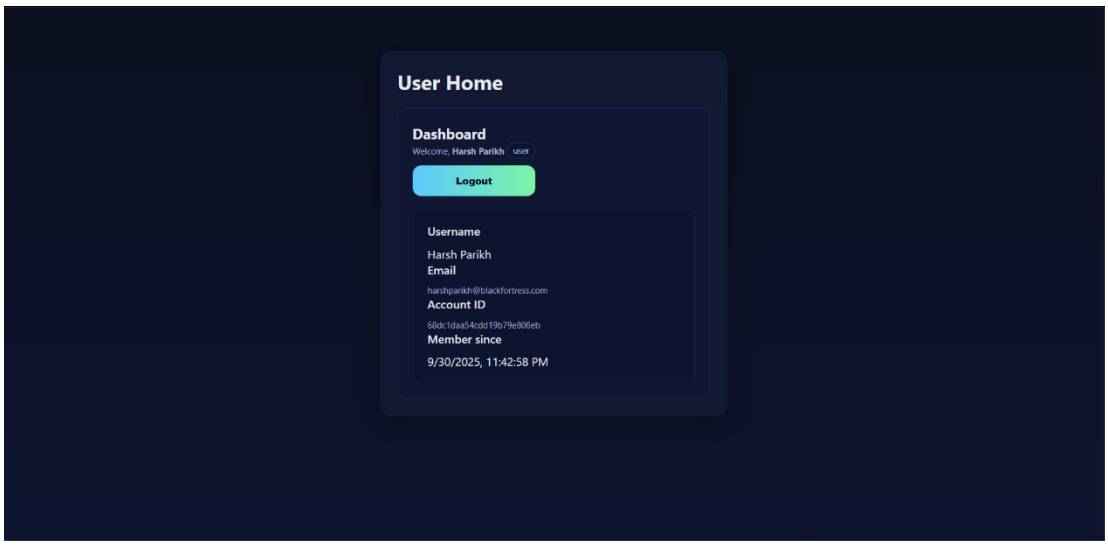
captcha.js

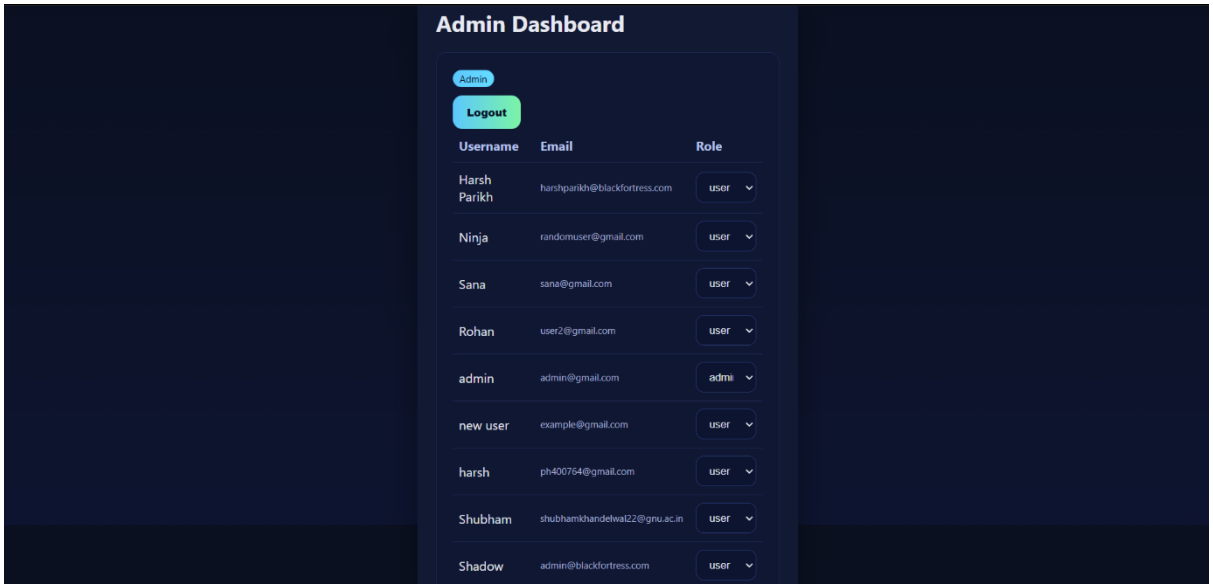
6. Screenshots




Create account
Username
Harsh Parikh
Email
harshparikh@blackfortress.com
Password
Show
Strong
Use 8+ chars with letters, numbers and a symbol.
Role
User
Create account
Have an account? Login


Login
Email
harshparikh@blackfortress.com
Password
Show
Sign in
No account? Register


User Home
Dashboard
Welcome, Harsh Parikh user
Logout
Username
Harsh Parikh
Email
harshparikh@blackfortress.com
Account ID
68dc1daa54cdd19b79e808eb
Member since
9/30/2025, 11:42:58 PM



7. Deployment Instructions

1. Clone the repository
2. Run npm install
3. Configure .env file with:
4. PORT=5000
5. NODE_ENV=production
6. JWT_SECRET=yourSecretKey
7. MONGO_URI=yourMongoConnectionString
8. RECAPTCHA_SITE_KEY=optional
9. RECAPTCHA_SECRET=optional
10. Start server: node src/server.js
11. Open in browser: http://localhost:5000

8. Conclusion

The Black Fortress project delivers a secure, modular authentication system with role-based access control. It emphasizes security, scalability, and usability, making it suitable for integration into production-grade applications.