Sahyadri Forts Explorer – Project Report

Full Stack Development (CA II)

MAHATMA EDUCATION SOCIETY'S

PILLAI COLLEGE OF ARTS, COMMERCE & SCIENCE

(Autonomous)

NEW PANVEL

PROJECT REPORT ON

"Sahyadri Forts Explorer"

IN PARTIAL FULFILLMENT OF

BACHELOR OF <u>COMPUTER APPLICATION</u>

SEMESTER IV: 2025-26

PROJECT GUIDE

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**3. Table of Contents**

4. Introduction

Purpose and Importance

The project provides a centralized digital platform to explore Sahyadri forts, plan trekking activities, and view structured historical and safety information. It is designed for trekking enthusiasts, students, and heritage visitors.

Project Overview

Sahyadri Forts Explorer is a full-stack web application that allows users to view forts on an interactive map (Leaflet.js), browse listings with search and filters (difficulty, region, and season), and access detailed information including history, trek duration, safety tips, and facilities. An admin panel enables authorized users to add, edit, and delete fort data.

The system is built using **Node.js, Express.js, MySQL, Bootstrap 5, and Leaflet.js**.
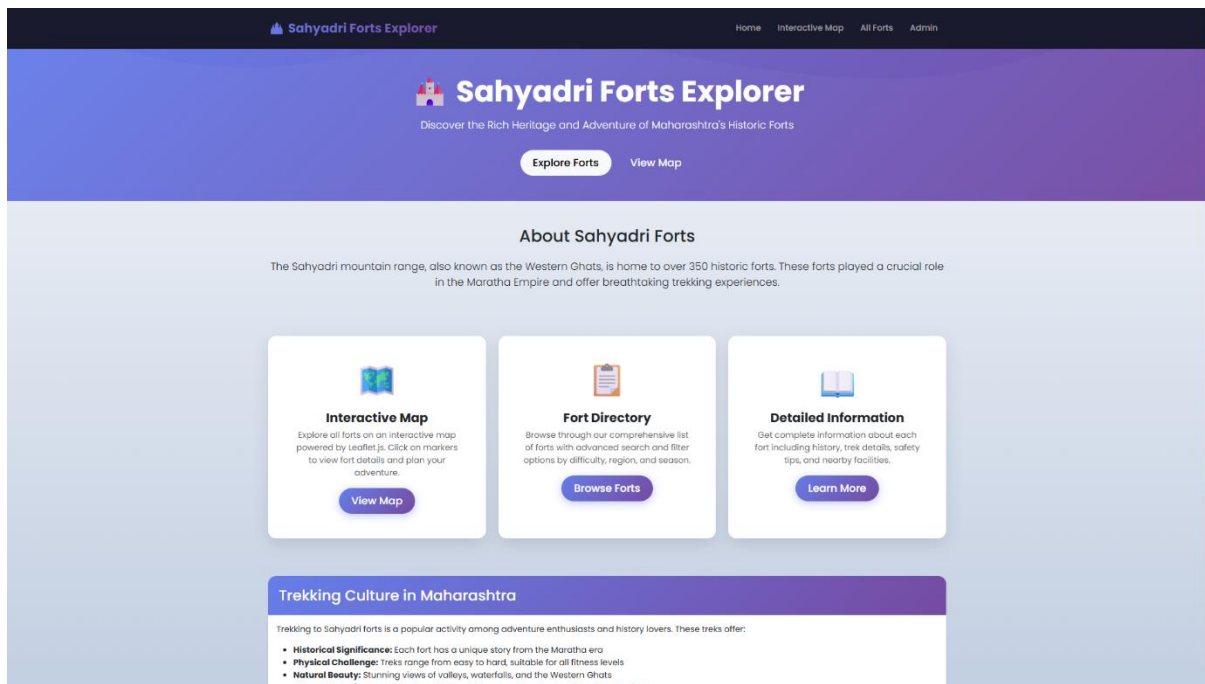
5. Problem Definition

Information about Sahyadri forts is scattered across multiple sources and often lacks structure. Users find it difficult to view all forts on a single map, filter them by difficulty or season, and access organized trekking and safety details.

This project addresses the issue by providing a unified web application where fort data is stored in a database, displayed visually on a map, and managed through an administrative dashboard.

6. Objectives

- Develop a user-friendly web application to explore Sahyadri forts

- Implement CRUD operations using REST-style APIs

- Store fort data permanently in a MySQL database

- Display forts on an interactive map using Leaflet.js

- Provide search and filtering by difficulty, region, and season

- Create an admin panel for adding, editing, and deleting forts

- Ensure responsive UI using Bootstrap 5

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7. Methodology

System Architecture

Frontend (Bootstrap, EJS, Leaflet.js) communicates with the Backend (Node.js, Express.js), which connects to the Database (MySQL). REST APIs and server-rendered pages manage request flow.

Technology Stack

Frontend: HTML5, CSS3, JavaScript, Bootstrap 5, EJS, Leaflet.js
Backend: Node.js, Express.js
Database: MySQL

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8. Literature Review

Full-stack web applications integrate frontend, backend, and database layers to deliver dynamic functionality. Express.js is widely used for routing and server logic, while EJS enables server-side rendering of pages. Leaflet.js provides lightweight, open-source mapping capabilities without requiring API keys.
Sahyadri forts hold historical and trekking importance within the Western Ghats, making a centralized mapping and information system beneficial for planning and safety.

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9. Implementation

Project Structure

- server.js – Express server entry point

- routes/forts.js – Public pages (home, map, listing, details)

- routes/admin.js – Admin CRUD routes

- views/ – EJS frontend templates

- config/database.js – MySQL connection configuration

- database/schema.sql – Table structure and sample data

Database Design

A primary table **forts** stores attributes such as name, historical information, difficulty level, trek duration, best season, safety tips, coordinates, and region.
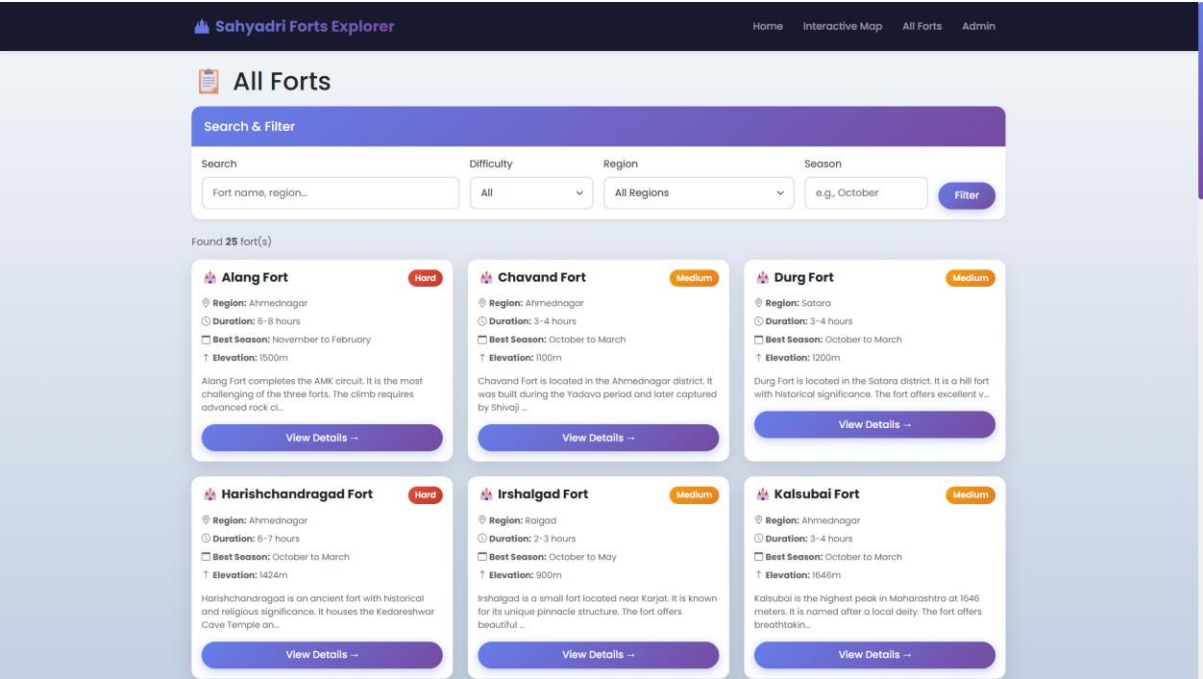
Sample Code – Fetching Forts for Map

```
router.get('/map', async (req, res) => {

  const [forts] = await db.execute(

    'SELECT id, name, latitude, longitude, difficulty, region FROM forts'

  );

  res.render('map', { forts: forts });

});
```
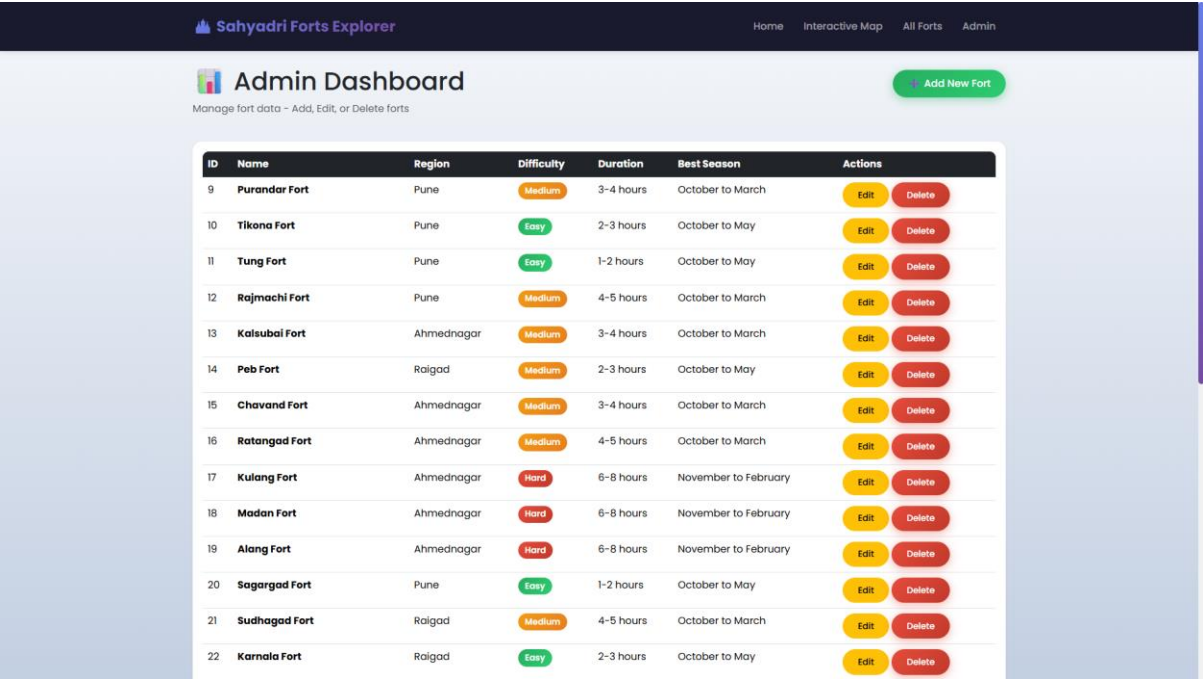
MAP PAGE :
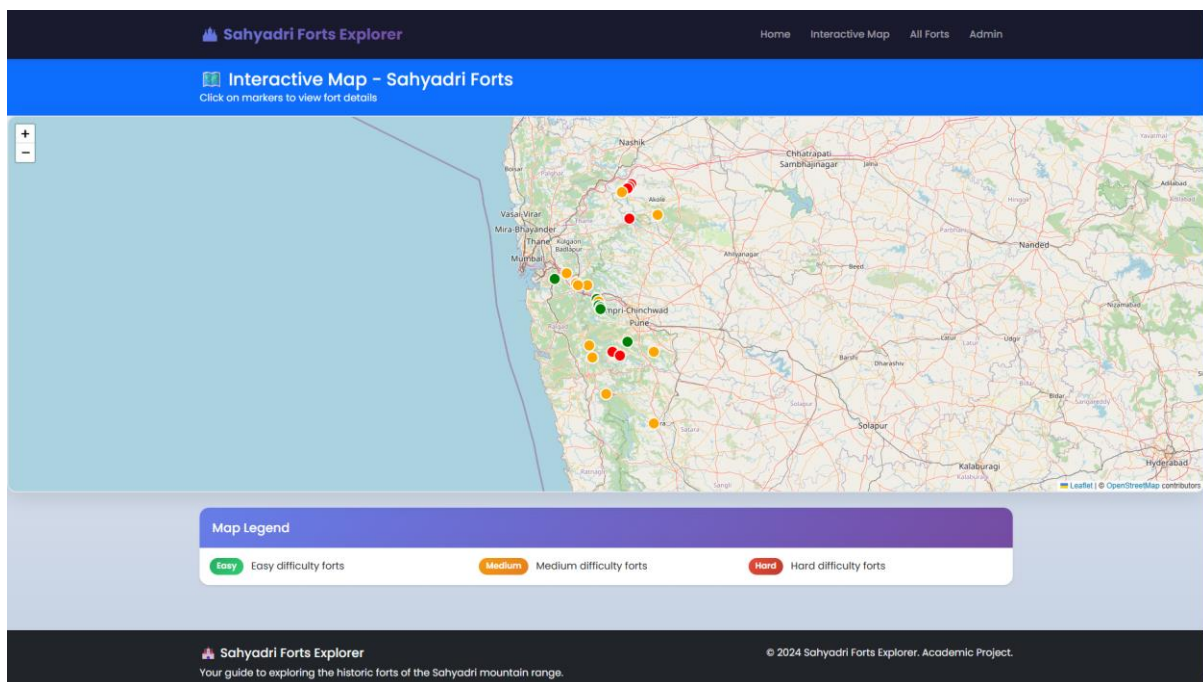
Fort Detail / Listing :

Admin Dashboard :

10. API Endpoints (CRUD Operations)

Create: POST /admin/add → Inserts new fort record (INSERT INTO)
Read:

- GET / → Landing Page

- GET /map → Map View

- GET /forts → Listing with Filters

- GET /forts/:id → Fort Details

- GET /api/forts → JSON Data
  Update: POST /admin/edit/:id → Updates fort (UPDATE)
 **Delete:** POST /admin/delete/:id → Removes fort (DELETE)

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11. Features

- Responsive UI using Bootstrap 5

- Persistent MySQL database storage

- Interactive map with markers and popups

- Search and filter functionality
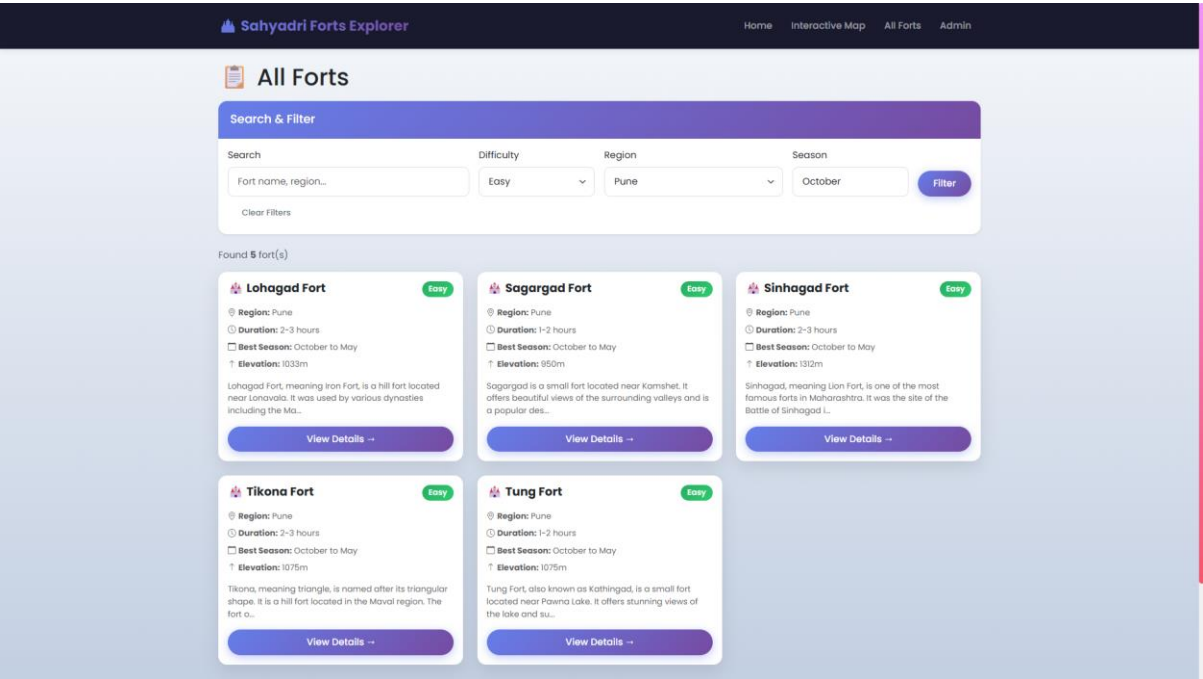
- Admin CRUD dashboard

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12. Result

The application successfully delivers a working landing page, interactive map with markers, searchable fort listings, detailed fort pages, and an admin interface for CRUD operations. Data persistence is maintained through MySQL, and the UI adapts across devices.

Detailed Fort Information :
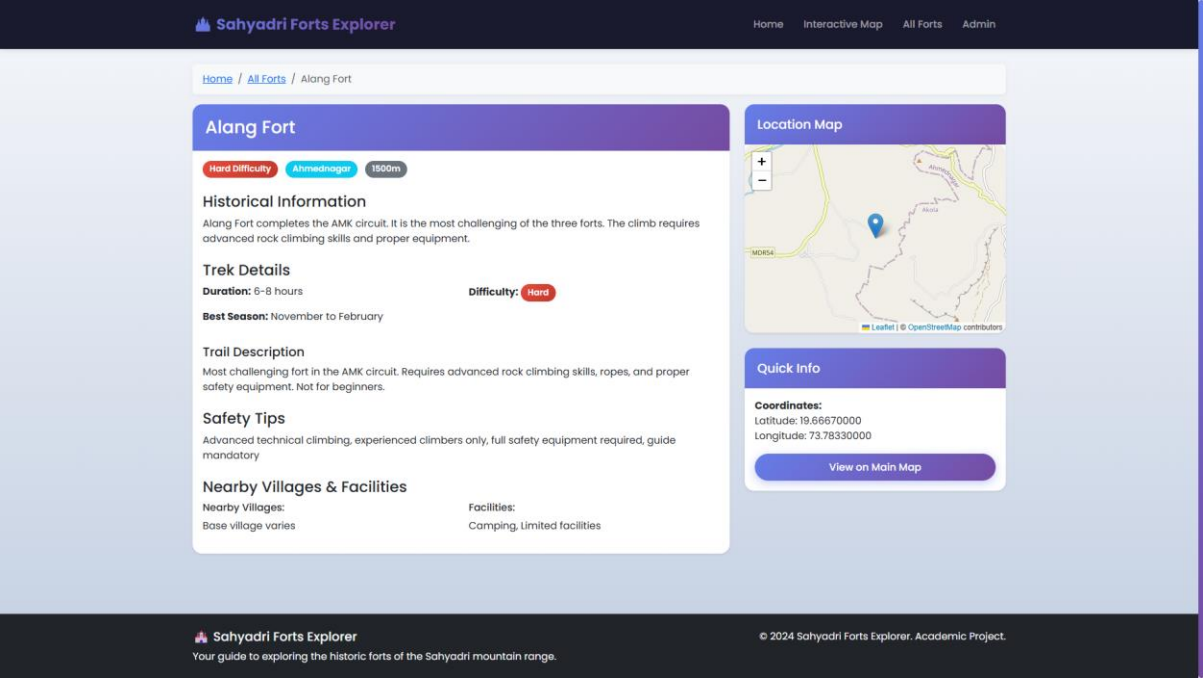
With Filters Applied :

13. Conclusion

The Sahyadri Forts Explorer project demonstrates the practical implementation of a full-stack web application using Node.js, Express.js, MySQL, Bootstrap, and Leaflet.js. It

effectively integrates frontend design, backend logic, and database management to provide a functional heritage exploration system that fulfills academic project requirements.

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14. Future Scope

Possible enhancements include user authentication, reviews and ratings, offline data support, and development of a mobile application using the same backend and database.

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15. References

- Express.js – https://expressjs.com/

- Leaflet.js – https://leafletjs.com/

- Bootstrap 5 – https://getbootstrap.com/

- MySQL – https://dev.mysql.com/doc/

- Node.js – https://nodejs.org/

END OF REPORT

Mahatma Education Society's

**PILLAI COLLEGE OF ARTS, COMMERCE & SCIENCE
(Autonomous), New Panvel**

Re-accredited "A" Grade by NAAC (3rd Cycle)

Project Completion Certificate

THIS IS TO CERTIFY THAT

Anirudha Pawar

of **SYBCA** has completed the project titled

" *Sahyadri Forts Explorer* "

Under our guidance and supervision during the academic year
2025-26 in the department of Information Technology

Course Coordinator   Head of Department