

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 COMPUTER APPLICATION

SEMESTER IV: 2025-26

PROJECT GUIDE

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4. Introduction

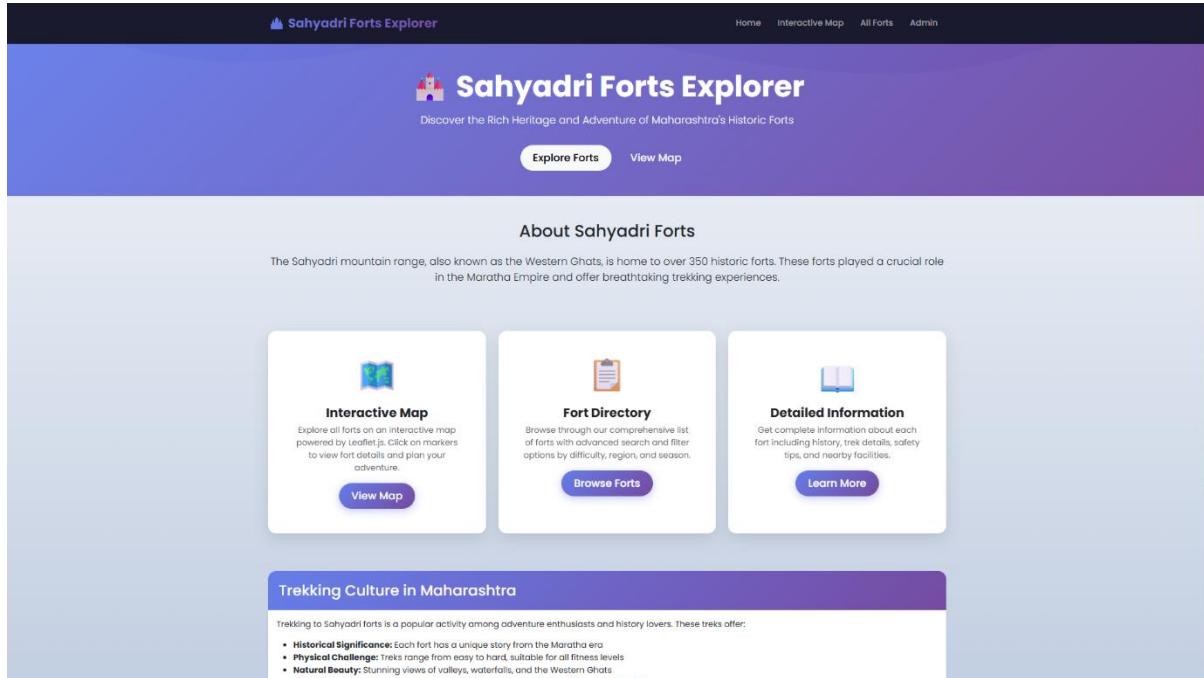
Purpose and Importance

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
-

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

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.

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

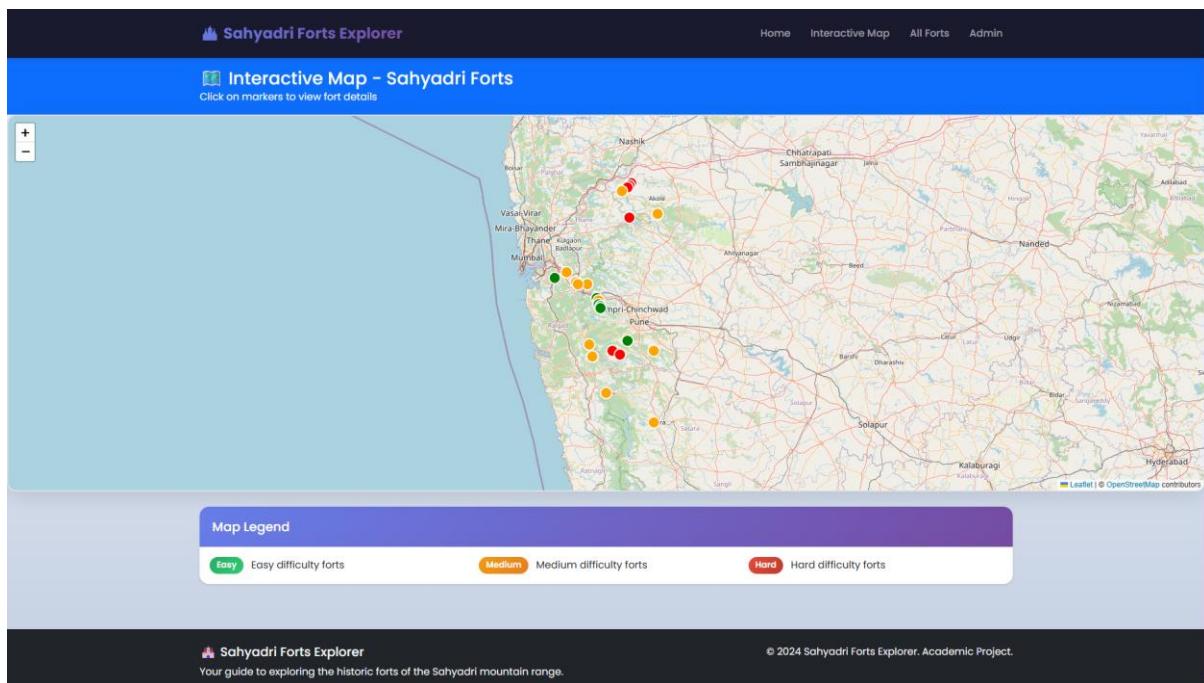
Database Design

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 :

The screenshot shows the 'All Forts' page of the Sahyadri Forts Explorer website. At the top, there's a search bar with placeholder text 'Fort name, region...', dropdown menus for 'Difficulty' (All), 'Region' (All Regions), and 'Season' (e.g., October), and a 'Filter' button. Below the search bar, it says 'Found 25 fort(s)'. There are six fort cards displayed in a grid:

- Alang Fort** (Hard): Region: Ahmednagar, Duration: 6-8 hours, Best Season: November to February, Elevation: 1500m. Description: Alang Fort completes the AMK circuit. It is the most challenging of the three forts. The climb requires advanced rock climbing skills.
- Chavand Fort** (Medium): Region: Ahmednagar, Duration: 3-4 hours, Best Season: October to March, Elevation: 1100m. Description: Chavand Fort is located in the Ahmednagar district. It was built during the Yadava period and later captured by Shivaji.
- Durg Fort** (Medium): Region: Satara, Duration: 3-4 hours, Best Season: October to March, Elevation: 1200m. Description: Durg Fort is located in the Satara district. It is a hill fort with historical significance. The fort offers excellent views of the surrounding area.
- Harishchandragad Fort** (Hard): Region: Ahmednagar, Duration: 6-7 hours, Best Season: October to March, Elevation: 1424m. Description: Harishchandragad is an ancient fort with historical and religious significance. It houses the Kedareshwar Cave Temple.
- Irshalgad Fort** (Medium): Region: Raigad, Duration: 2-3 hours, Best Season: October to May, Elevation: 900m. Description: Irshalgad is a small fort located near Karjat. It is known for its unique pinnacle structure. The fort offers beautiful views of the surrounding hills.
- Kalsubai Fort** (Medium): Region: Ahmednagar, Duration: 3-4 hours, Best Season: October to March, Elevation: 1646m. Description: Kalsubai is the highest peak in Maharashtra at 1646 meters. It is named after a local deity. The fort offers breathtaking views of the surrounding landscape.

Each fort card has a 'View Details →' button.

Admin Dashboard :

The screenshot shows the Admin Dashboard page of the Sahyadri Forts Explorer website. At the top, there's a header with the logo 'Sahyadri Forts Explorer' and navigation links for Home, Interactive Map, All Forts, and Admin. A green button labeled 'Add New Fort' is visible. Below the header, it says 'Manage fort data ~ Add, Edit, or Delete forts.' A table lists 22 fort records:

ID	Name	Region	Difficulty	Duration	Best Season	Actions
9	Purandar Fort	Pune	Medium	3-4 hours	October to March	<button>Edit</button> <button>Delete</button>
10	Tikona Fort	Pune	Easy	2-3 hours	October to May	<button>Edit</button> <button>Delete</button>
11	Tung Fort	Pune	Easy	1-2 hours	October to May	<button>Edit</button> <button>Delete</button>
12	Rajmachi Fort	Pune	Medium	4-5 hours	October to March	<button>Edit</button> <button>Delete</button>
13	Kalsubai Fort	Ahmednagar	Medium	3-4 hours	October to March	<button>Edit</button> <button>Delete</button>
14	Peb Fort	Raigad	Medium	2-3 hours	October to May	<button>Edit</button> <button>Delete</button>
15	Chavand Fort	Ahmednagar	Medium	3-4 hours	October to March	<button>Edit</button> <button>Delete</button>
16	Ratangad Fort	Ahmednagar	Medium	4-5 hours	October to March	<button>Edit</button> <button>Delete</button>
17	Kulang Fort	Ahmednagar	Hard	6-8 hours	November to February	<button>Edit</button> <button>Delete</button>
18	Madan Fort	Ahmednagar	Hard	6-8 hours	November to February	<button>Edit</button> <button>Delete</button>
19	Alang Fort	Ahmednagar	Hard	6-8 hours	November to February	<button>Edit</button> <button>Delete</button>
20	Sagardag Fort	Pune	Easy	1-2 hours	October to May	<button>Edit</button> <button>Delete</button>
21	Sudhagad Fort	Raigad	Medium	4-5 hours	October to March	<button>Edit</button> <button>Delete</button>
22	Karnala Fort	Raigad	Easy	2-3 hours	October to May	<button>Edit</button> <button>Delete</button>

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)
-

11. Features

- Responsive UI using Bootstrap 5
 - Persistent MySQL database storage
 - Interactive map with markers and popups
 - Search and filter functionality
 - Admin CRUD dashboard
-

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 :

The screenshot shows the detailed information page for Alang Fort. At the top, there's a header with the logo 'Sahyadri Forts Explorer' and navigation links for Home, Interactive Map, All Forts, and Admin. Below the header, the page title is 'Alang Fort'. Key details include: Difficulty: Hard, Location: Ahmednagar, Elevation: 1500m. The 'Historical Information' section notes that Alang Fort completes the AMK circuit and requires advanced rock climbing skills. 'Trek Details' mention a duration of 6-8 hours and a best season from November to February. The 'Trail Description' is described as most challenging with advanced rock climbing requirements. 'Safety Tips' advise using advanced technical climbing and safety equipment. 'Nearby Villages & Facilities' show nearby villages like Base village varies and facilities like Camping, Limited facilities. A 'Location Map' shows the fort's location in Ahmednagar district, with coordinates: Latitude: 19.66670000, Longitude: 73.78330000. A 'Quick Info' sidebar provides a 'View on Main Map' button.

With Filters Applied :

The screenshot shows the 'All Forts' page with applied filters. The search bar includes fields for 'Search' (Fort name, region...), 'Difficulty' (Easy), 'Region' (Pune), and 'Season' (October). A 'Filter' button is present. The results section shows five fort cards: Lohagad Fort (Easy, Region: Pune, Duration: 2-3 hours, Best Season: October to May, Elevation: 1033m), Sagardad Fort (Easy, Region: Pune, Duration: 1-2 hours, Best Season: October to May, Elevation: 950m), Sinhagad Fort (Easy, Region: Pune, Duration: 2-3 hours, Best Season: October to May, Elevation: 1312m), Tikona Fort (Easy, Region: Pune, Duration: 2-3 hours, Best Season: October to May, Elevation: 1075m), and Tung Fort (Easy, Region: Pune, Duration: 1-2 hours, Best Season: October to May, Elevation: 1075m). Each fort card has a 'View Details' button.

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.

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.

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/>
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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

