

Jury Examination Presentation

Attharv Banage
ADT23SOCB1514

Course: Full Stack Development

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B.Tech IT SMAD

Department of Information Technology

MIT School of Computing, Pune

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Introduction



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A Leap Towards World Class Education

DSA Learning is an interactive **web-based platform** built using **React + Vite**.

It helps students understand **Data Structures & Algorithms** through structured content, visually appealing course cards, and easy navigation.

- The platform includes:
- Home Page
- About Page
- Courses Page
- Contact Page
- Cart System
- Login & Registration

This project demonstrates concepts of **React components, React Router, Hooks, State Management, and Front-end development**.

Problem Statement

Many students find Data Structures & Algorithms difficult because traditional learning is **text-heavy and non-interactive**.

There is a need for a **clean, structured, easy-to-use web interface** that helps students:

- Browse DSA topics
- View course summaries
- Add & manage courses in a cart
- Access information without confusion

DSA Learning solves this by offering a **simple, attractive, and functional website** for learning DSA.

Scope

- **The scope of the platform includes:**
 - Displaying DSA-related courses
 - Adding courses to the cart (local storage)
 - User Registration & Login (localStorage)
 - Basic navigation using React Router
 - Responsive UI using Bootstrap
- **It does *not* include:**
 - Backend database
 - Payment gateway
 - Live coding IDE
 - Real-time user authentication

Objectives

- To design a React-based single-page website for DSA learning
- To implement modular components (Navbar, Footer, Course Cards)
- To apply React Router for seamless navigation
- To use JSX, Hooks (useState, useEffect), and LocalStorage
- To create a responsive & aesthetic UI using Bootstrap
- To provide functional Login & Registration without backend

Technology Stack

Frontend

- **React.js** (for UI components)
- **Vite** (for fast bundling & dev server)
- **JavaScript (ES6+)**
- **JSX** (for HTML + JS mixing)
- **Bootstrap 5** (for styling)
- **CSS3** (custom styling)
- **React Router DOM** (for routing)

Tools

- **VS Code**
- **Node.js**
- **npm**
- **Google Chrome / Edge**

Data Storage

- Browser **localStorage** for:
 - User details
 - Cart items

Database Design

**User → React UI → React Components →
LocalStorage → Rendered Pages**

Pages include:

- Home
- About
- Courses
- Contact
- Login
- Register
- Cart

Components include:

- Navbar
- Footer
- Course Card Component

Implementation – Front-End



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Implementation – Back-End



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- **Add to Cart Logic:**

```
const addToCart = (course) => {  
  const items = JSON.parse(localStorage.getItem("cartItems")) || [];  
  items.push(course);  
  localStorage.setItem("cartItems", JSON.stringify(items));  
  window.dispatchEvent(new Event("cartUpdated"));  
};
```

- **Login Validation:**

```
if (storedUser && storedUser.email === email && storedUser.password === password) {  
  navigate("/");  
} else {  
  setError("Invalid email or password");  
}
```

- **Register Logic:**

```
if (storedUser && storedUser.email === email && storedUser.password === password) {  
  navigate("/");  
} else {  
  setError("Invalid email or password");  
}
```


Future Plans

- Add backend using Node/Express or Firebase
- Add user dashboards
- Add real payment gateway for courses
- Add admin panel to manage courses
- Add DSA visualizers (graphs, trees, recursion animation)
- Add quizzes for each topic
- Add dark/light mode

Conclusion

The DSA Learning web app successfully achieves its objective of providing a clean, modular, and interactive front-end platform using React.

The project demonstrates:

- Practical use of React Hooks
- Component-based architecture
- Routing & state management
- LocalStorage handling
- Responsive UI creation