EXPERIMENT-09

- **AIM: -** To design and implement a simple Library Management UI that allows users to search for books, add new books, and remove existing books, demonstrating core full-stack development concepts.
- **THEORY: -** Full Stack Development integrates both frontend (UI/UX) and backend (server, database).

✓ The frontend (React/HTML + CSS) enables interaction like search, add, and remove.
✓ The backend (Node.js + Express) handles data storage and retrieval.
✓ A database (MongoDB / in-memory for demo) stores book records (title, author, id).
✓ REST APIs (GET, POST, DELETE) facilitate communication between frontend and backend.
✓ Search functionality is implemented via string matching on book titles/authors.

- **CODE: -**

1. **BACKEND→**

```
// backend/index.js
const express = require("express");
const cors = require("cors");
const app = express();
app.use(cors());
app.use(express.json());

let books = [
  { id: 1, title: "Harry Potter", author: "J.K. Rowling" },
  { id: 2, title: "The Alchemist", author: "Paulo Coelho" },
];

// Get all books
app.get("/books", (req, res) => {
  res.json(books);
```

```
});

// Add a new book
app.post("/books", (req, res) => {
  const { title, author } = req.body;
  const newBook = { id: books.length + 1, title, author };
  books.push(newBook);
  res.json(newBook);
});

// Delete a book
app.delete("/books/:id", (req, res) => {
  const { id } = req.params;
  books = books.filter((book) => book.id !== parseInt(id));
  res.json({ message: "Book removed" });
});

app.listen(5000, () => console.log("Server running on port
5000"));
```

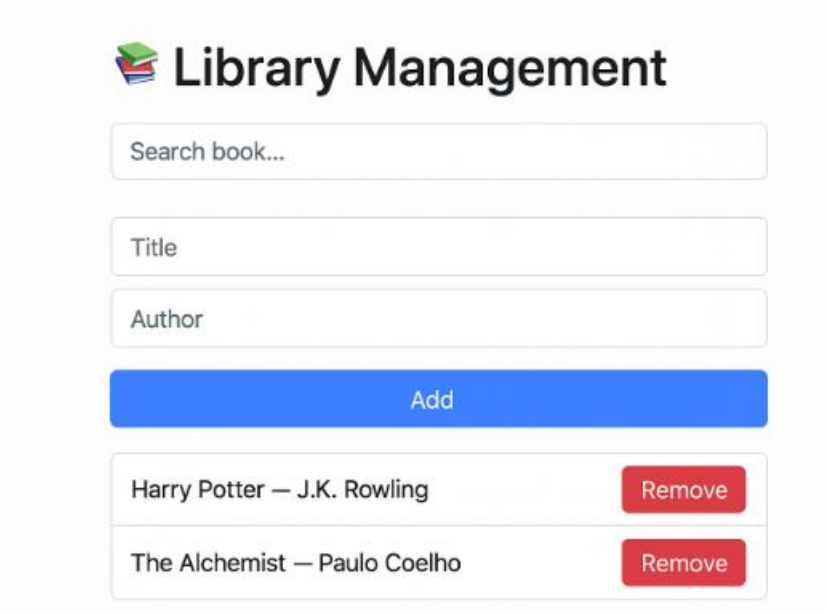
2. **FRONTEND→**

```
// frontend/App.js
import React, { useState, useEffect } from "react";

function App() {
  const [books, setBooks] = useState([]);
  const [search, setSearch] = useState("");
  const [title, setTitle] = useState("");
  const [author, setAuthor] = useState("");

  useEffect(() => {
    fetch("http://localhost:5000/books")
      .then(res => res.json())
      .then(data => setBooks(data));
  }, []);
```

```
  const addBook = () => {
    fetch("http://localhost:5000/books", {
      method: "POST",
      headers: { "Content-Type": "application/json" },
      body: JSON.stringify({ title, author }),
    })
    .then(res => res.json())
    .then(data => setBooks([...books, data]));
  };

  const removeBook = (id) => {
    fetch(`http://localhost:5000/books/${id}`, { method:
"DELETE" })
      .then(() => setBooks(books.filter(book => book.id !==
id)));
  };

  return (
    <div className="p-6 max-w-lg mx-auto">
      <h1 className="text-2xl font-bold mb-4">📚 Library
Management</h1>

      {/* Search */}
      <input
        type="text"
        placeholder="Search book..."
        className="border p-2 w-full mb-4"
        value={search}
        onChange={(e) => setSearch(e.target.value)}
      />

      {/* Add Book */}
      <div className="flex gap-2 mb-4">
        <input type="text" placeholder="Title"
className="border p-2"
```

```
        value={title} onChange={(e) =>
setTitle(e.target.value)} />
      <input type="text" placeholder="Author"
className="border p-2"
        value={author} onChange={(e) =>
setAuthor(e.target.value)} />
      <button onClick={addBook} className="bg-blue-500
text-white px-3 rounded">
        Add
      </button>
    </div>

    {/* Book List */}
    <ul>
      {books
        .filter(b =>
b.title.toLowerCase().includes(search.toLowerCase()))
        .map((book) => (
        <li key={book.id} className="flex justify-between
items-center border-b py-2">
          <span>{book.title} — {book.author}</span>
          <button onClick={() => removeBook(book.id)}
className="bg-red-500 text-white px-2 rounded">
            Remove
          </button>
        </li>
      ))}
    </ul>
  </div>
 );
}

export default App;
```

- **<u>OUTPUT→</u>**



- **<u>LEARNING OUTCOMES→</u>**

✓ Understood integration of frontend and backend in a full-stack app.
✓ Learned how to implement CRUD operations (Create, Read, Delete) in REST APIs.
✓ Practiced state management in React with dynamic updates.
✓ Understood how to handle search filters in frontend UI.
✓ Gained experience in designing a realistic library management prototype.