Experiment - 3

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Subject Name: Full Stack- I	**Subject Code:** 23CSP-339

Aim: To build an interactive library management interface using React components with full CRUD (Create, Read, Update, Delete) functionality.

Objective: The main objective is to-

1. Design a book listing component.
2. Implement search functionality.
3. Add a form for new book entries.
4. Enable update and delete capabilities for each book.
5. Manage state using React hooks.

Hardware/Software Requirements:

1. Processor: Intel i5/Ryzen 5 or higher
2. RAM: 8GB minimum.
3. Display: 1920x1080 resolution.
4. Node.js v18+
5. React.js v18+
6. VS code with ES7 + extensions.
7. JSON server(for mock PIs).

About the Experiment -

This experiment demonstrates how to build a dynamic and responsive Library Management System using React.

Concepts covered-

1. Component-based architecture.
2. State management with hooks(useState, useEffect).
3. Controlled forms and event handling.
4. Conditional rendering.
5. RESTful API interaction with fetch.

Code implementation -

```
import React, { useState, useEffect } from 'react';


function App() {
  const [books, setBooks] = useState([]);
  const [formData, setFormData] = useState({ title: '', author: '' });
  const [searchTerm, setSearchTerm] = useState('');
  const [editingBookId, setEditingBookId] = useState(null);

  // Fetch initial books from JSON Server
  useEffect(() => {
  fetch('http://localhost:3001/books')
      .then(res => res.json())
      .then(data => setBooks(data));
  }, []);

  // Handle form input change
  const handleChange = e => {
    setFormData({ ...formData, [e.target.name]: e.target.value });
  };
```

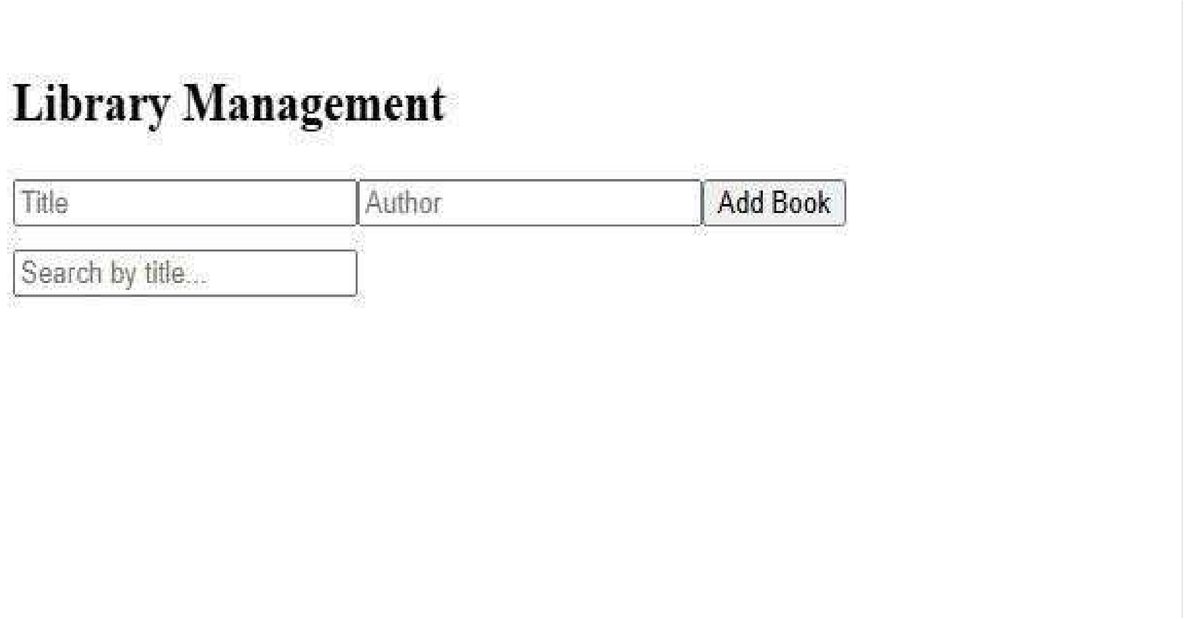
```
 // Handle Add / Update book
 const handleSubmit = e => {
 e.preventDefault();
  if (editingBookId) {
   // Update book
   fetch(`http://localhost:3001/books/${editingBookId}`, {
   method: 'PUT',
    headers: { 'Content-Type': 'application/json' },
    body: JSON.stringify(formData),
   })
    .then(res => res.json())
    .then(updatedBook => {
     setBooks(books.map(book => (book.id === editingBookId ? updatedBook :
book)));
     setEditingBookId(null);
     setFormData({ title: '', author: '' });
    });
  } else {
   // Add new book
```

```
    fetch('http://localhost:3001/books', {
      method: 'POST',
      headers: { 'Content-Type': 'application/json' },
      body: JSON.stringify(formData),
    })
      .then(res => res.json())
      .then(newBook => {
        setBooks([...books, newBook]);
        setFormData({ title: '', author: '' });
      });
  }
};

// Edit book
const handleEdit = book => {
  setEditingBookId(book.id);
  setFormData({ title: book.title, author: book.author });
};

// Delete book
```

```
const handleDelete = id => {
  fetch(`http://localhost:3001/books/${id}`, {
  method: 'DELETE',
  }).then(() => {
    setBooks(books.filter(book => book.id !== id));
  });
};

// Filtered books for search
const filteredBooks = books.filter(book =>
  book.title.toLowerCase().includes(searchTerm.toLowerCase())
);

return (
  <div style={{ padding: '20px' }}>
    <h2>Library Management</h2>

    {/* Add / Update Book Form */}
    <form onSubmit={handleSubmit}>
      <input
    name="title"
    placeholder="Title"
    value={formData.title}
    onChange={handleChange}
    required
  />
  <input
    name="author"
    placeholder="Author"
    value={formData.author}
    onChange={handleChange}
    required
  />
  <button type="submit">{editingBookId ? 'Update' : 'Add'} Book</button>
</form>

{/* Search Bar */}
<input
  placeholder="Search by title..."
  value={searchTerm}
```

```
        onChange={e => setSearchTerm(e.target.value)}
        style={{ marginTop: '10px' }}
      />

      {/* Book List */}
      <ul>
        {filteredBooks.map(book => (
          <li key={book.id}>
            <strong>{book.title}</strong> by {book.author}
            <button onClick={() => handleEdit(book)}>Edit</button>
            <button onClick={() => handleDelete(book.id)}>Delete</button>
          </li>
        ))}
      </ul>
    </div>
  );
}

export default App;
```

Output:


Library Management
Title
Author
Add Book
Search by title...