Detailed Project Report

Development of an E-commerce Sales Chatbot

1. Introduction

The increasing competition in e-commerce demands innovative and user-friendly tools that enhance the customer shopping experience. This project aims to develop a conversational sales chatbot for an e-commerce platform focused on a specific product category. The chatbot enables users to interact via a simple chat interface to search for products, explore details, and facilitate the purchase process seamlessly.

2. Technology Stack

Layer	Technology Used	Reason / Benefits
Frontend	React.js, HTML5, CSS	Highly responsive UI, component-based architecture, ease of integration with REST APIs
Backend	Python, Flask	Lightweight, modular, easy API development and session management
Database	MySQL (via MySQL Workbench)	Reliable RDBMS, widely used, supports complex queries
Authentication	Flask sessions, bcrypt hashing	Secure user login and session handling
Tools	VS Code, PowerShell, npm, pip	Popular IDE, terminal, and package managers

3. System Architecture

- **Frontend (React)**:
  Provides a responsive UI that works on desktop, tablet, and mobile devices. Includes login, chatbot interface, and product display components.
- **Backend (Flask API)**:
  Handles user authentication, processes search queries, fetches product data from the MySQL database, and manages user sessions.
- **Database (MySQL)**:
  Stores user credentials and a mock inventory of 100 products with fields such as product ID, name, description, category, price, and image URL.
- Communication occurs through RESTful API calls secured by session tokens.

4. Mock Data and Database Design

- The product table includes the following fields:
  - id (Primary key)
  - name (Product name)
  - description (Brief product details)
  - category (Product category like electronics, books, textiles)
  - price (Numeric value)
  - image_url (Link to product image)
- 100 mock products were created with varied categories and price ranges to simulate a realistic catalog.

5. Implementation Details

- **Authentication Module**:
  Users log in with credentials checked against hashed passwords in the database. Flask sessions maintain login state.
- **Chatbot Interface**:
  Accepts user input, sends search queries to backend, displays products in card format with image, name, price, and category.
- **Product Search Logic**:
  Backend processes queries using SQL LIKE to find matching products by name or category.
- **Session Management**:
  User chat sessions persist during their interaction and can be reset anytime with a reset button.

6. Sample Queries and Results

User Query	Backend Search Performed	Result Displayed
"Product 10"	Search for products with name LIKE '%Product 10%'	Single product card with details for Product 10 shown, including image and price
"Electronics"	Search products with category LIKE '%Electronics%'	List of all electronic category products displayed as cards
"Book"	Search for products with category or name LIKE '%Book%'	Relevant book category products shown

7. Challenges Faced and Solutions

- **Session Continuity**:
  Maintaining session across React frontend and Flask backend was challenging. Solved by using Flask session cookies with proper CORS and credentials handling.
- **Data Seeding**:
  Generating realistic mock product data was time-consuming. Resolved by scripting SQL insert queries and randomizing categories and prices.
- **User Experience**:
  Designing a chatbot that is intuitive yet simple required iterative UI improvements.

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8. Learnings and Future Enhancements

- Learned to integrate React and Flask for full-stack application development.
- Gained experience in handling user sessions securely and efficiently.
- Explored REST API design and modular code structuring.
- Future scope includes implementing NLP for better query understanding, adding shopping cart functionality, and enhancing security with JWT tokens.

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9. Conclusion

This project successfully demonstrates the development of a sales chatbot that improves customer interaction by simplifying product search and exploration. It integrates modern frontend and backend technologies with a robust database layer, providing a scalable and maintainable solution for e-commerce platforms.

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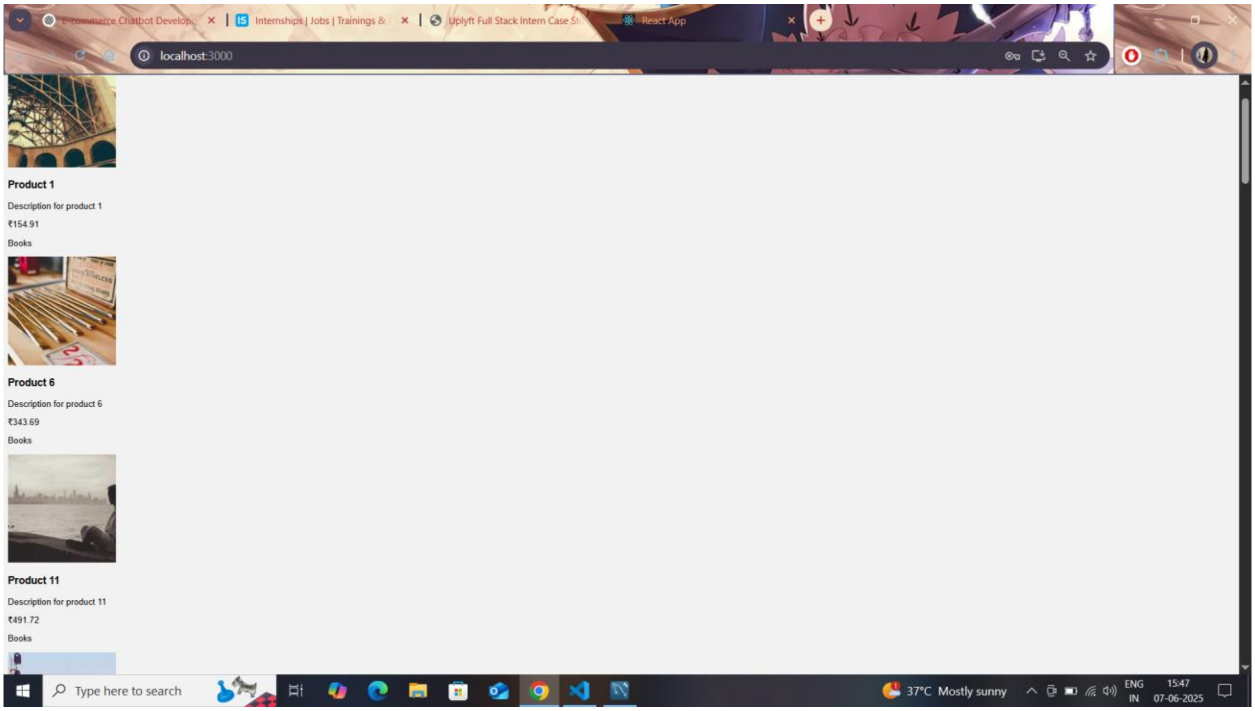
10. Output


E-commerce Chatbot Develop
Internships | Jobs | Trainings &
Uplyft Full Stack Intern Case St
React App
localhost:3000
Type here to search
37°C Mostly sunny
ENG
IN
15:47
07-06-2025

Product 1

Description for product 1

₹154.91

Books

Product 6

Description for product 6

₹343.69

Books

Product 11

Description for product 11

₹491.72

Books