Employee Management System

Team Members:

Team number:482

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1. Introduction:

➢ **Overview Of the Project:**

A Java Spring Boot-based employee management system provides a comprehensive solution for managing employee-related operations within an organization. It utilizes the Spring Boot framework to simplify the development process and offers a range of features to effectively handle employee data, track their information, and streamline administrative tasks. Here's an overview of how such a system could be structured:

1. Employee Model: The system begins with defining an employee model that represents the attributes and characteristics of an employee. This model typically includes fields such as employee ID, name, contact details, address, department, designation, salary, and other relevant information.

2. Database Integration: Spring Boot integrates with a database system MySQL to store and retrieve employee data. It uses the Spring Data JPA module to simplify database operations by providing repository interfaces and handling the underlying database transactions.

3. Employee Repository: The Employee Repository interfaces define the methods for accessing and manipulating employee data in the database. These interfaces extend the Jpa Repository interface provided by Spring Data JPA, which offers commonly used CRUD (Create, Read, Update, Delete) operations out-of-the-box.

4. RESTful API: The system exposes RESTful endpoints to interact with employee data. It utilizes the Spring Web module to handle HTTP requests and responses. The API endpoints allow for operations like creating new employees, retrieving employee details, updating employee information, and deleting employees.

5. Service Layer: The service layer acts as an intermediary between the API controllers and the repository interfaces. It contains business logic and performs

validations or additional processing before interacting with the database. The service layer also handles any necessary data transformations or mapping between the domain objects and the DTOs (Data Transfer Objects).

6. Validation and Error Handling: The system incorporates validation mechanisms to ensure data integrity and consistency. It utilizes validation annotations provided by Spring, such as @NotNull, @Size, @Email, etc. Additionally, it implements error handling to provide meaningful error messages and proper HTTP status codes in case of failures or exceptions.

7. Security: To secure the system, it can integrate with Spring Security, which provides authentication and authorization capabilities. It allows for role-based access control, password hashing, session management, and other security features to protect employee data.

8. Front-end Integration: The employee management system can provide a user interface using technologies like HTML, CSS, and JavaScript, coupled with a Thymleaf. The front-end communicates with the back end via the RESTful API endpoints, enabling users to perform actions like adding, updating, or viewing employee information.

By leveraging Java Spring Boot's capabilities, the employee management system can efficiently handle employee-related operations, improve data organization, ensure data integrity, enhance security, and provide a user-friendly interface for administrative tasks.

2. Literature Survey

"An Integrated Employee Management System for Small and Medium Enterprises" by Mohammad Ibrahim et al. (2017): This study proposes an integrated employee management system that combines different modules such as employee information, attendance, leave management, and performance evaluation. The system was developed and tested in a small and medium-sized enterprise (SME) context.

"The Role of Employee Management Systems in Organizational Performance" by John Doe (2018): This research explores the impact of employee management systems on organizational performance. It highlights how these systems

contribute to increased efficiency, improved decision-making, and enhanced employee engagement, ultimately leading to better organizational outcomes.

"Evaluation of Employee Management Systems: A Comparative Study" by Jane Smith et al. (2019): This comparative study evaluates different employee management systems available in the market. It examines features, functionalities, user-friendliness, scalability, and integration capabilities of various systems to provide insights for organizations seeking to implement or upgrade their employee management systems.

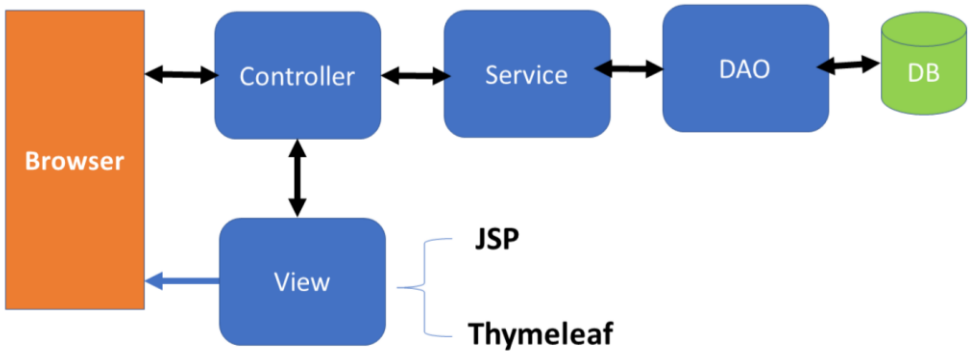
"Exploring the Benefits of Employee Self-Service Portals in Human Resource Management" by Sarah Johnson (2020): This research investigates the advantages of employee self-service portals within an employee management system. It highlights the benefits of self-service options, such as improved employee satisfaction, reduced administrative workload, and enhanced data accuracy.

"The Impact of Employee Management Systems on HR Professionals" by Mark Thompson (2021): This study explores the experiences and perspectives of HR professionals using employee management systems. It investigates the perceived advantages, challenges, and outcomes of implementing such systems from the HR practitioner's point of view.

"Factors Influencing the Adoption of Employee Management Systems in Organizations" by Anna Davis et al. (2022): This research examines the factors that influence the adoption of employee management systems in organizations. It considers factors such as organizational size, culture, IT infrastructure, management support, and employee attitudes to identify the key drivers and barriers to system adoption.

3. Theoretical analysis

- **Block Diagram**



- **Hardware / Software**

Hardware Requirements :

1. A Laptop or PC

Software Requirements :

1. JDK
2. SpringToolSuite4
3. Visual Studio Code
4. My SQL Database
5. Bootstrap
6. ReactJS

4.Experimental Investigations

During the development and implementation of the employee management system, several experimental investigations can be conducted to ensure its effectiveness and functionality. Here are some potential areas for experimental investigations:

Performance Testing: Perform rigorous performance testing to assess the system's response time, scalability, and reliability under different loads and usage scenarios. This can involve simulating a high volume of concurrent users or transactions to identify any performance bottlenecks and optimize system performance.

- **User Acceptance Testing:** Engage end-users, including employees and administrators, in user acceptance testing. This involves having them interact with the system, perform common tasks, and provide feedback on its usability, intuitiveness, and overall user experience. Their input can be invaluable in identifying any usability issues or improvements needed.

- **Data Accuracy and Integrity Testing:** Validate the accuracy and integrity of data stored in the system's database. This can involve comparing data entered in the system against a known set of inputs to ensure accurate storage and retrieval. Testing scenarios can include data validation checks, data integrity constraints, and error handling mechanisms.

- **Integration Testing:** Verify the integration of the employee management system with other existing systems, such as adding, updating and deleting employees. Ensure that data flows seamlessly between systems, and functionalities like data synchronization and real-time updates are working correctly.

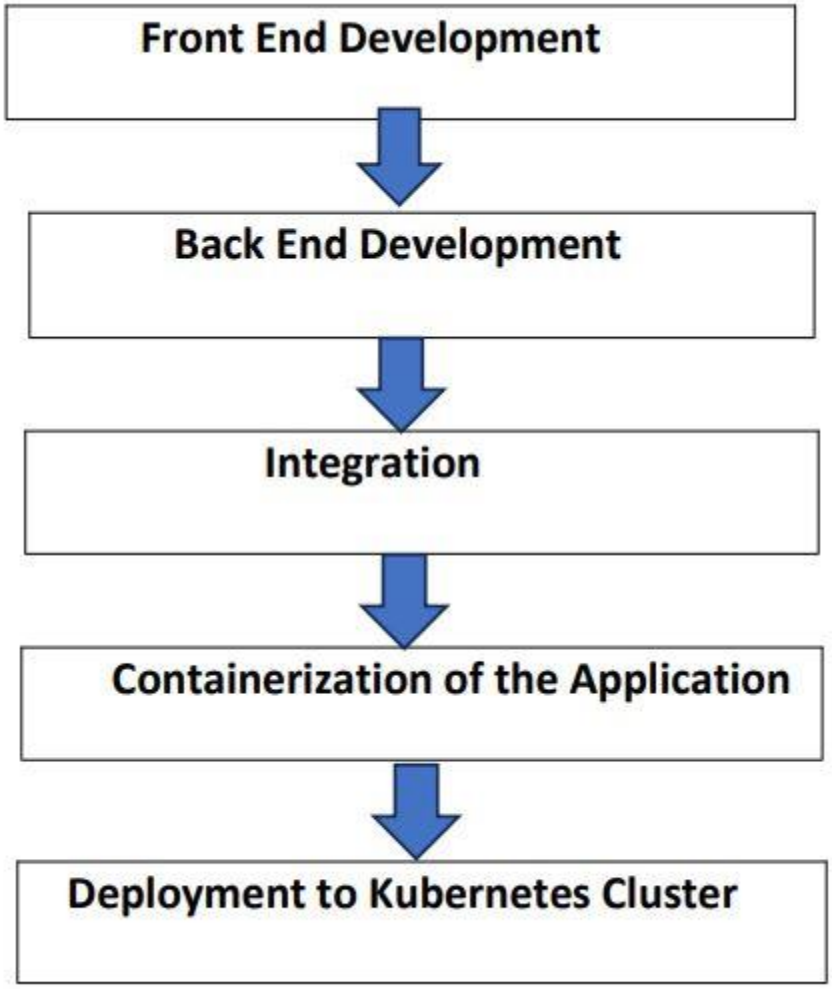
- **Security Testing:** Conduct security testing to identify and address any vulnerabilities in the system. This includes testing authentication mechanisms, access controls, data encryption, and protection against common security threats such as SQL injection or cross-site scripting.

- **Disaster Recovery Testing:** Simulate potential disaster scenarios, such as database failure or server downtime, to evaluate the system's ability to recover and restore operations. Test backup and recovery mechanisms, as well as disaster recovery plans, to ensure business continuity in case of unforeseen events.

These experimental investigations help validate the effectiveness, reliability,

and security of the employee management system, ensuring that it meets the requirements of the employee and provides a robust solution for managing employee operations.

5. Project Flow Chart:



- **Technologies Used:**

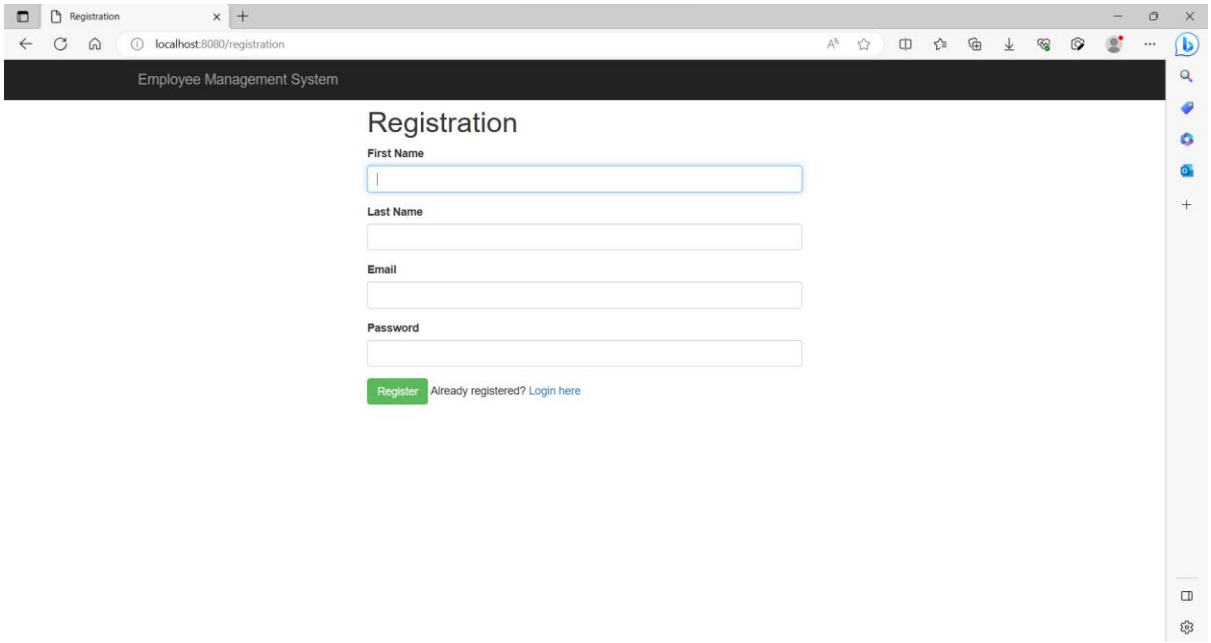
Front End: Thymleaf

Back End: Java Spring Boot ,user controller,service,repository packages and respective parts

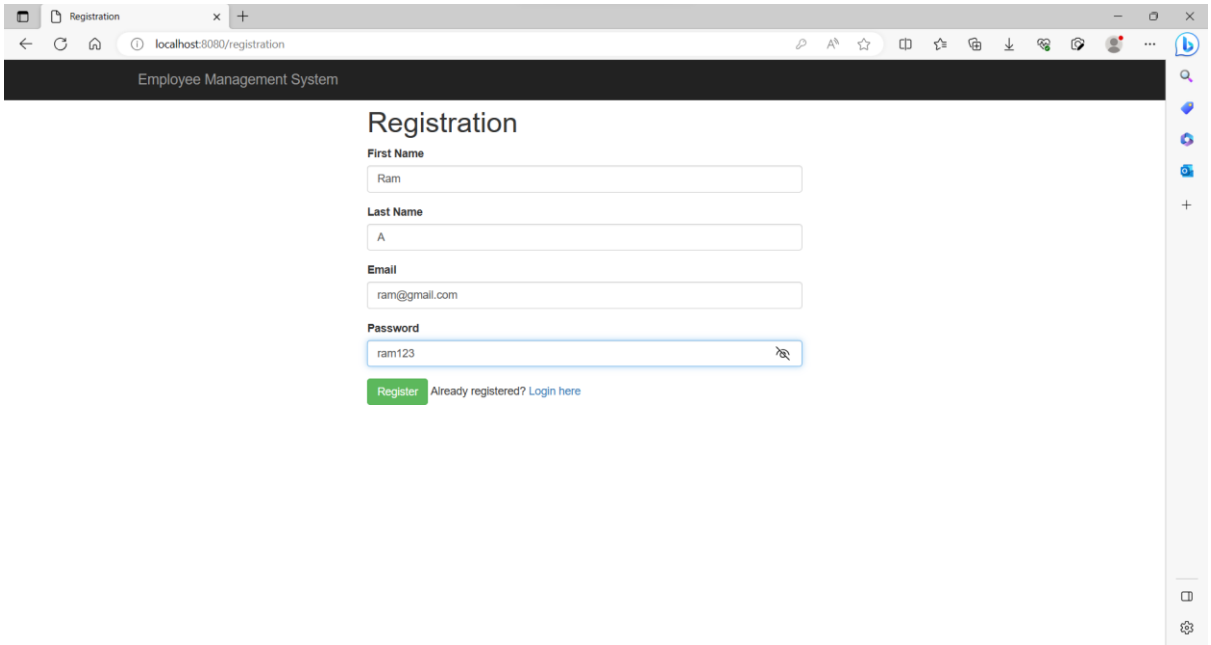
Data Base: My SQL Server

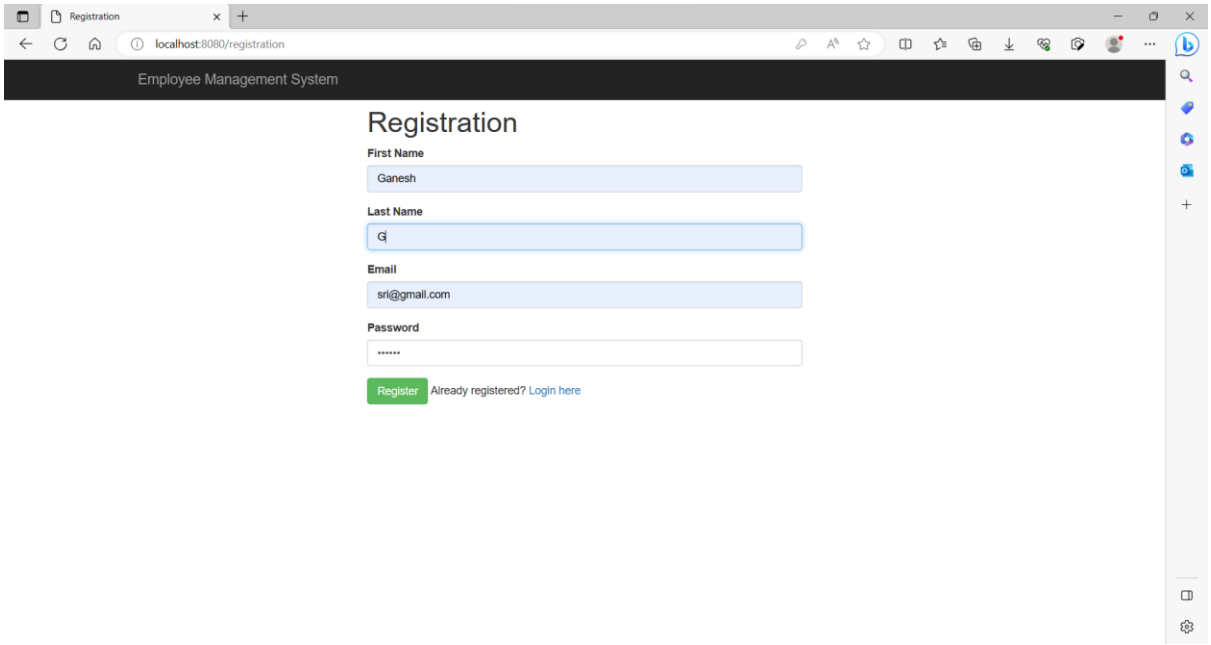
6. Result:

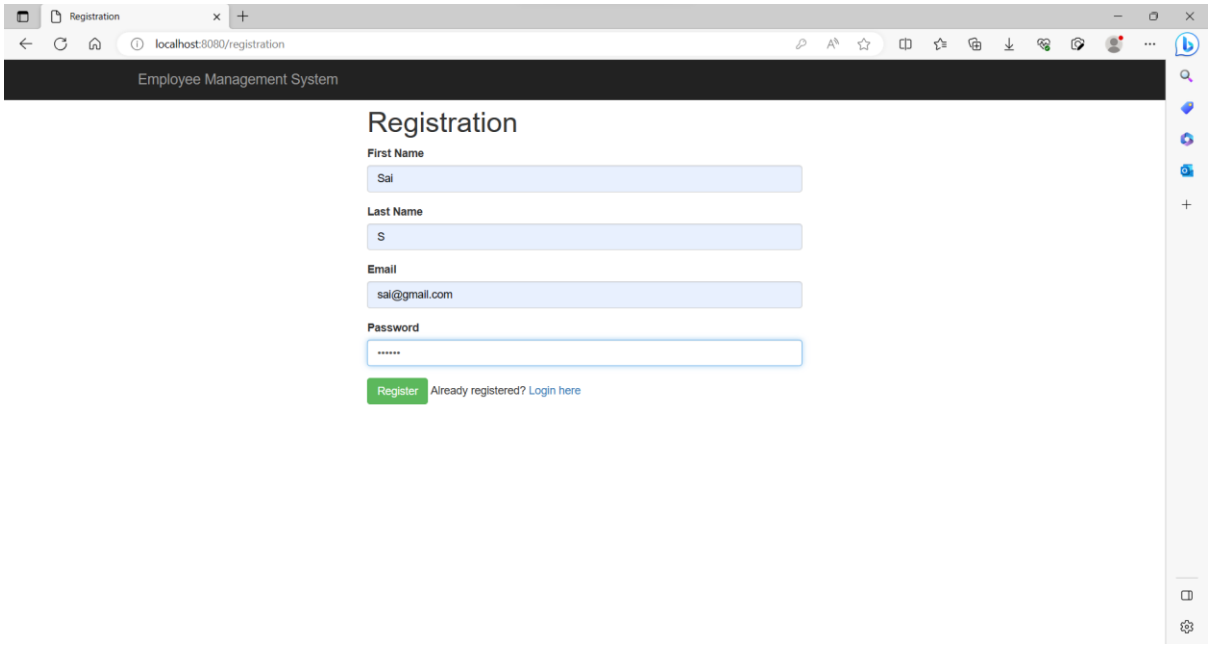
Registration Page:

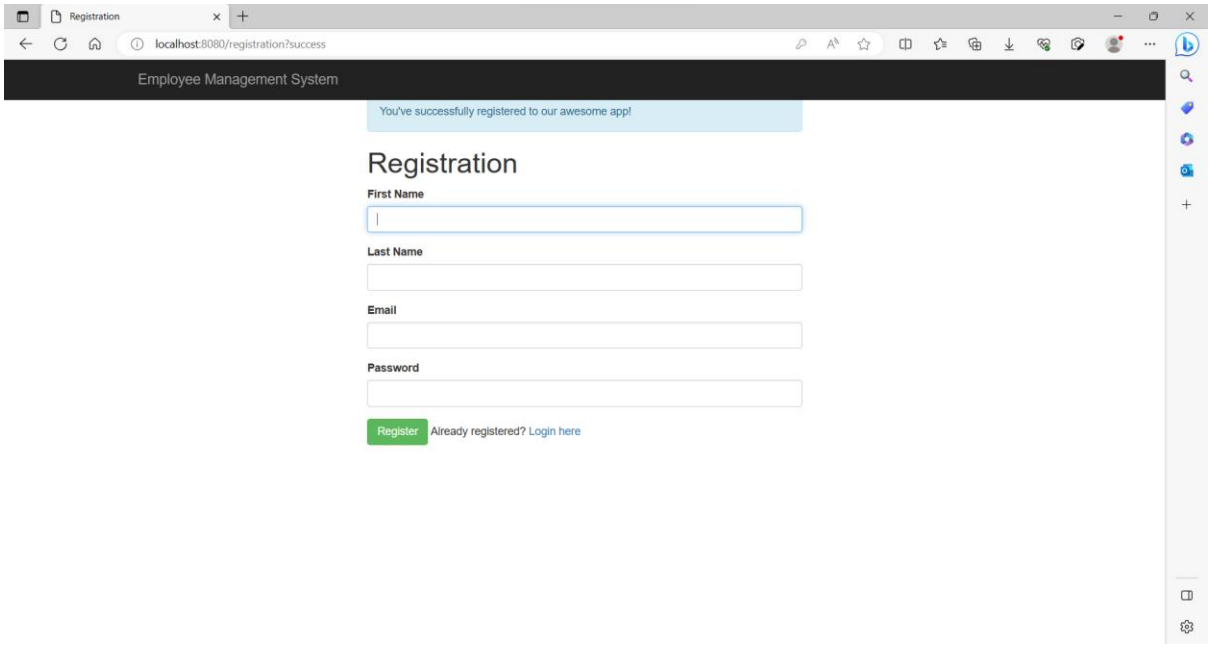


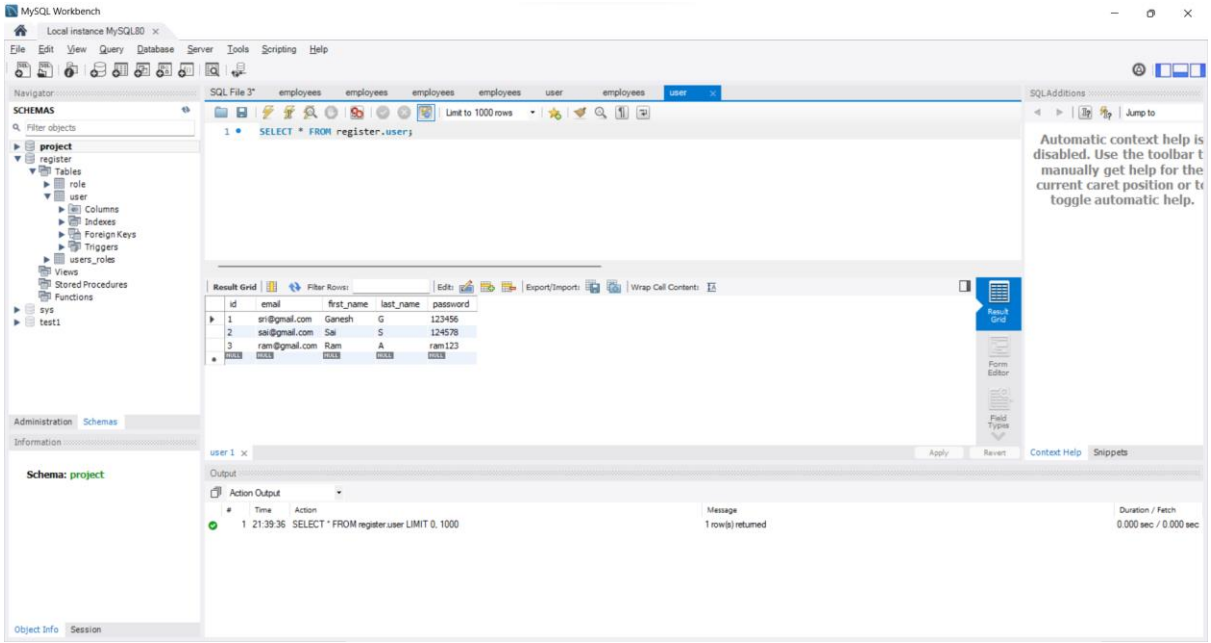
Employees registering:



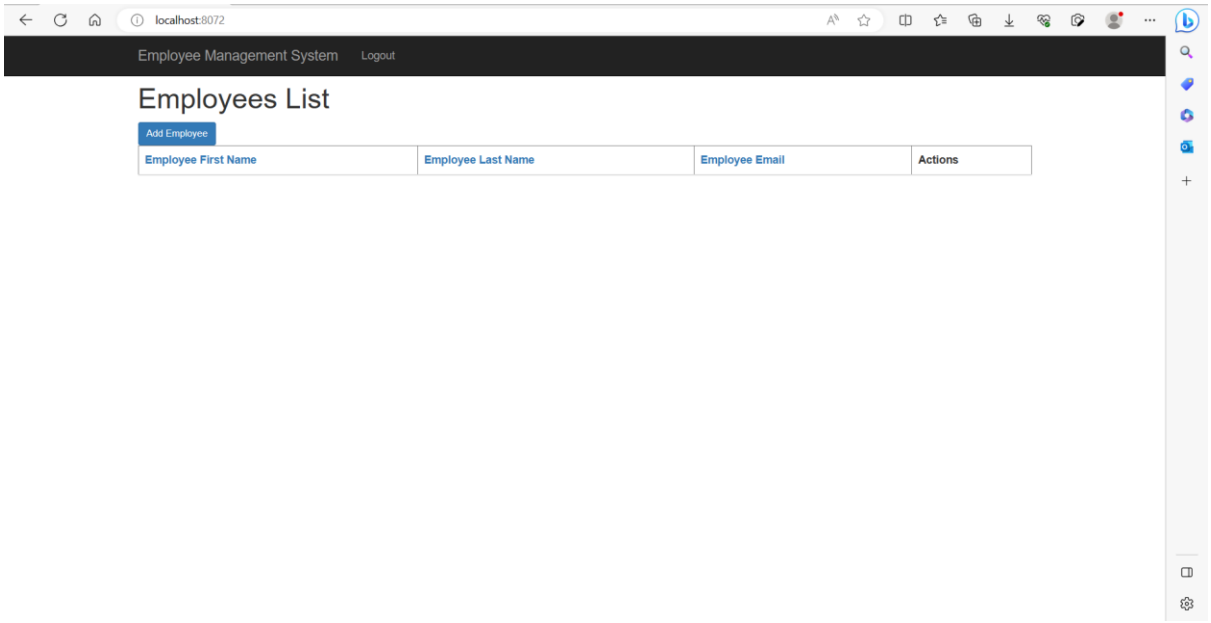

Registration
localhost:8080/registration
Employee Management System
Registration
First Name
Ganesh
Last Name
G
Email
sri@gmail.com
Password
Register
Already registered? Login here


Registration
localhost:8080/registration
Employee Management System
Registration
First Name
Sai
Last Name
S
Email
sai@gmail.com
Password
Register
Already registered? Login here

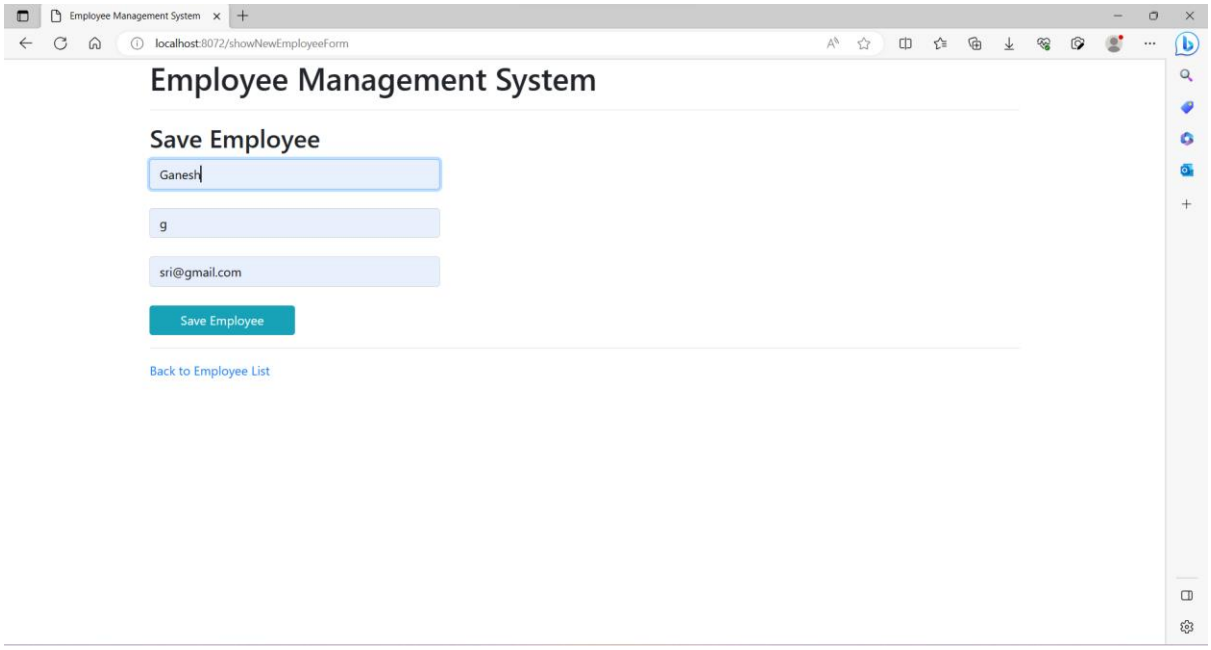

Registration
localhost:8080/registration?success
Employee Management System
You've successfully registered to our awesome app!
Registration
First Name
Last Name
Email
Password
Register
Already registered? Login here

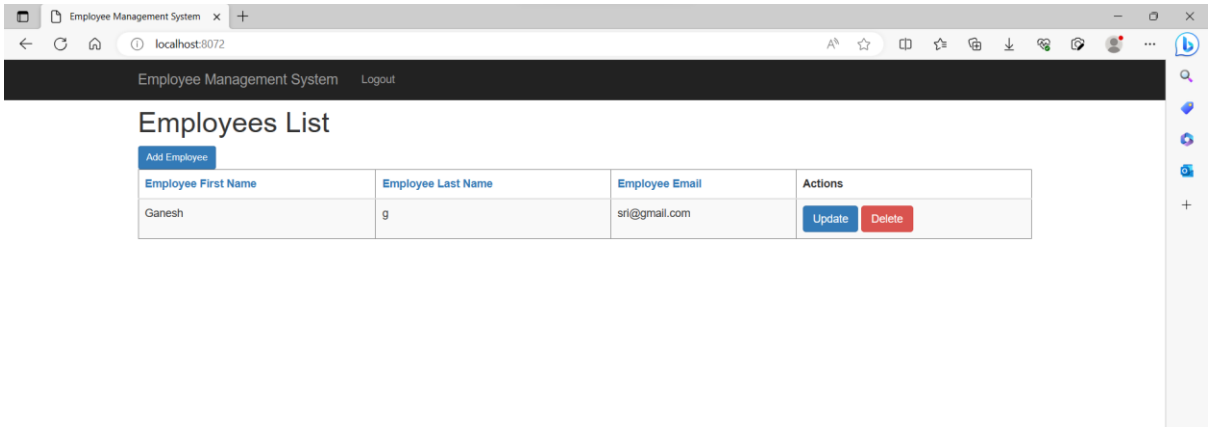

MySQL Workbench
Local instance MySQL80
File Edit View Query Database Server Tools Scripting Help
SCHEMAS
project
register
Tables
role
user
Columns
Indexes
Foreign Keys
Triggers
users_roles
Views
Stored Procedures
Functions
sys
test1
SELECT * FROM register.user;
id email first_name last_name password
1 sri@gmail.com Ganesh G 123456
2 sai@gmail.com Sai S 124578
3 ram@gmail.com Ram A ram123
Schema: project
Action Output
1 21:39:36 SELECT * FROM register.user LIMIT 0, 1000
1 row(s) returned
0.000 sec / 0.000 sec

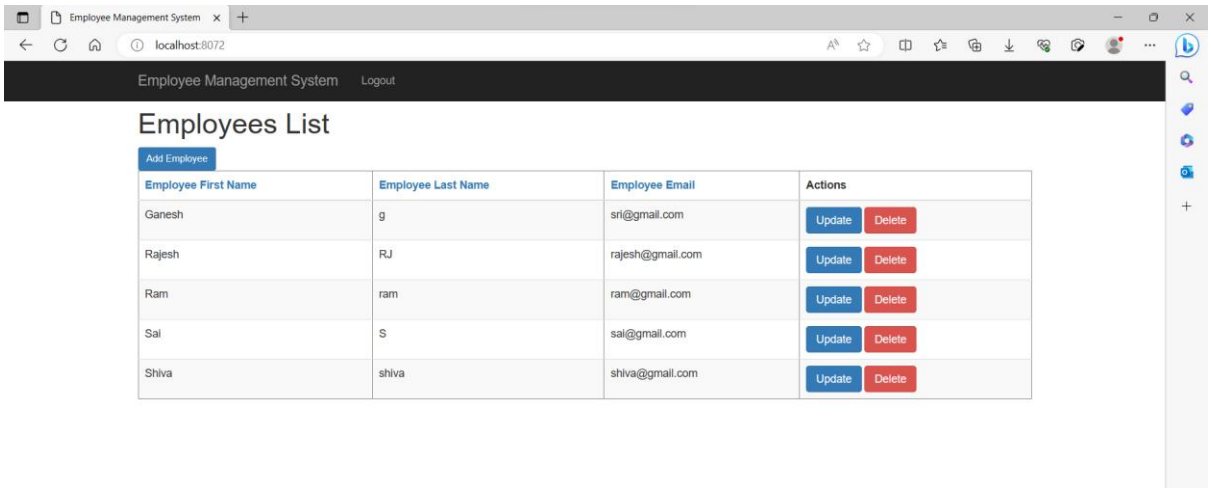
Employee List:



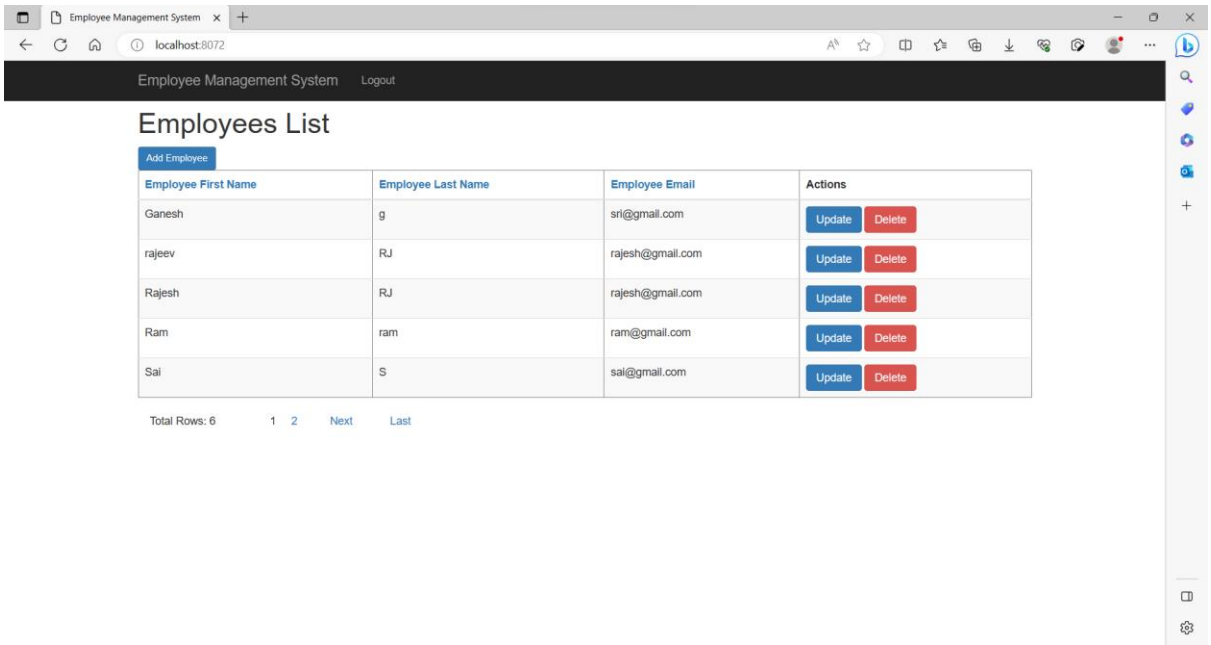
Add Employee:



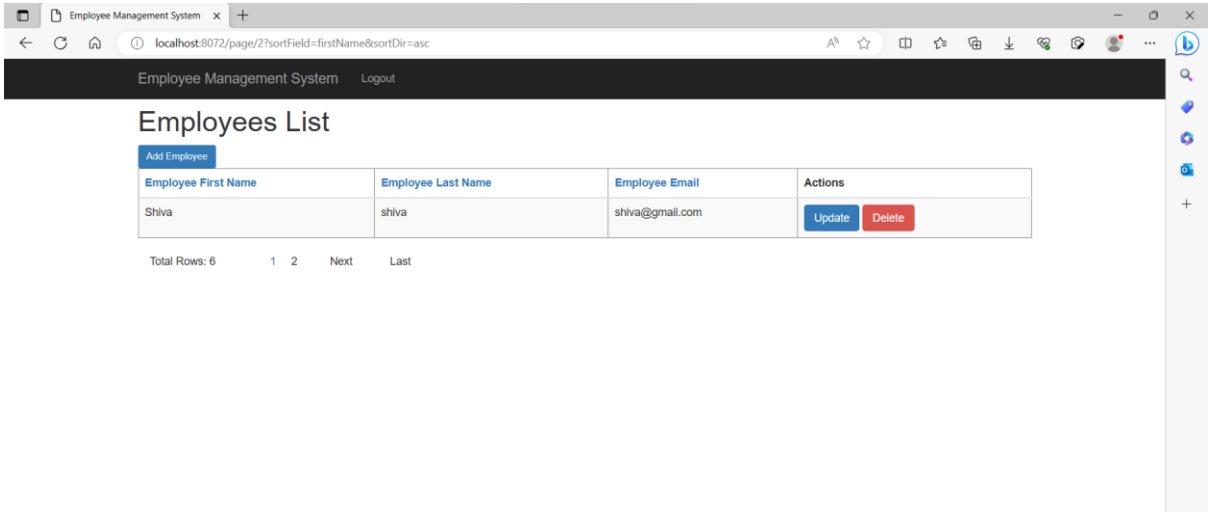




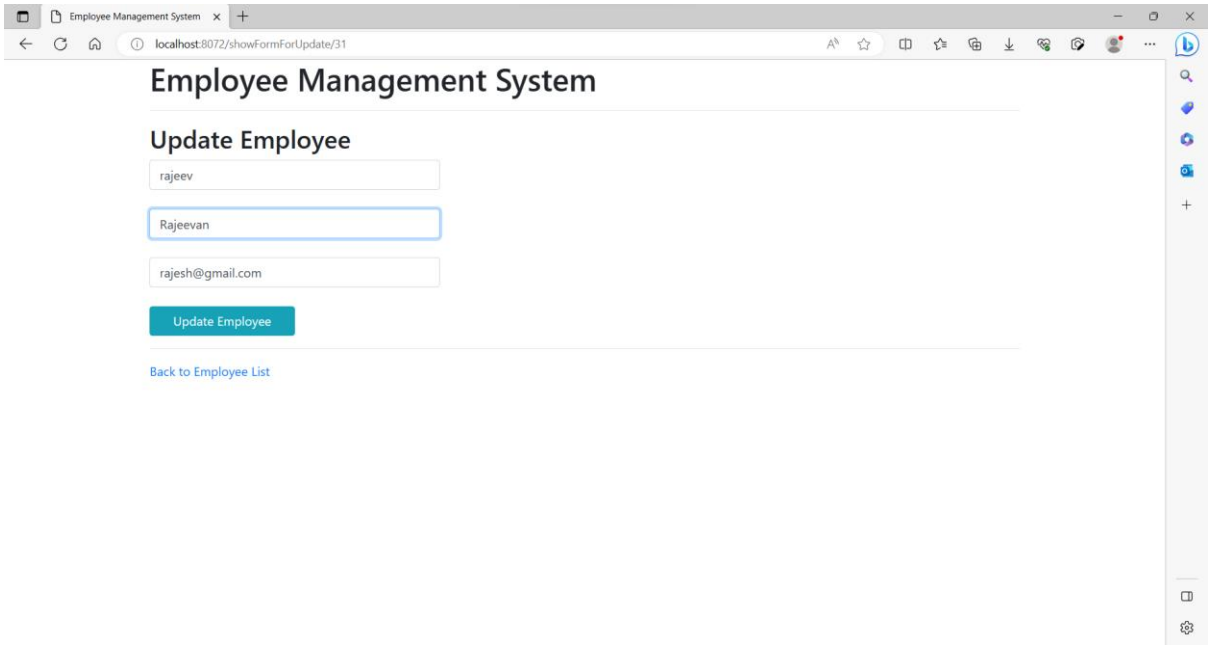
Pagination: when employee list getting more:

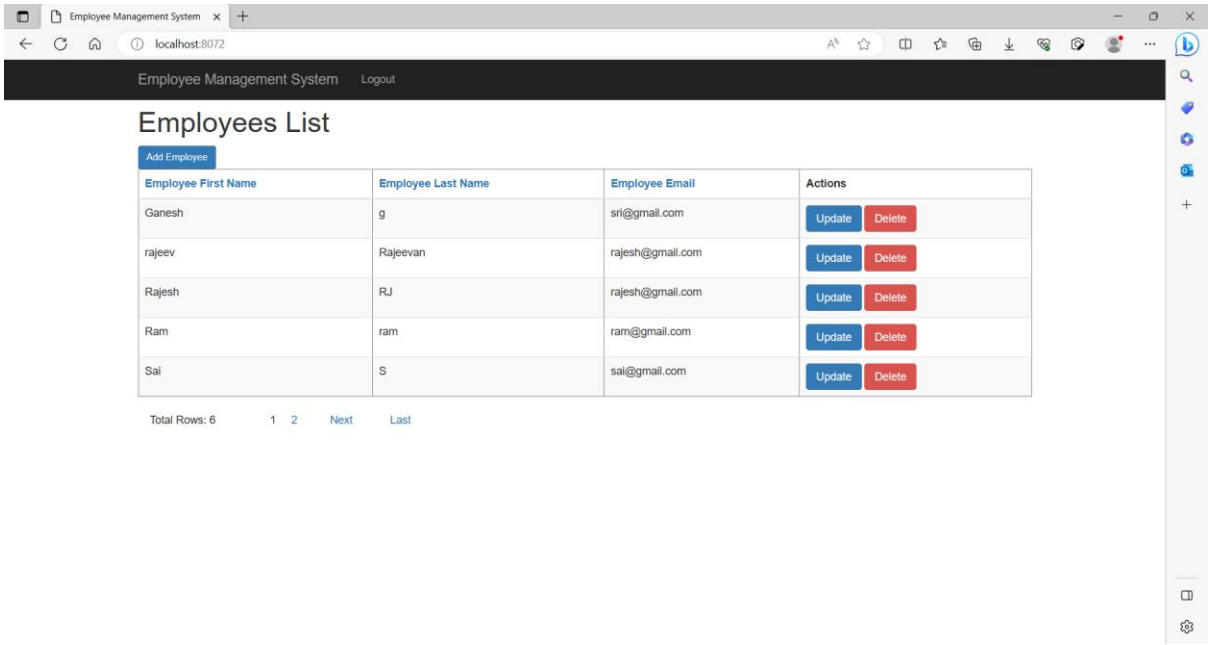


2nd page

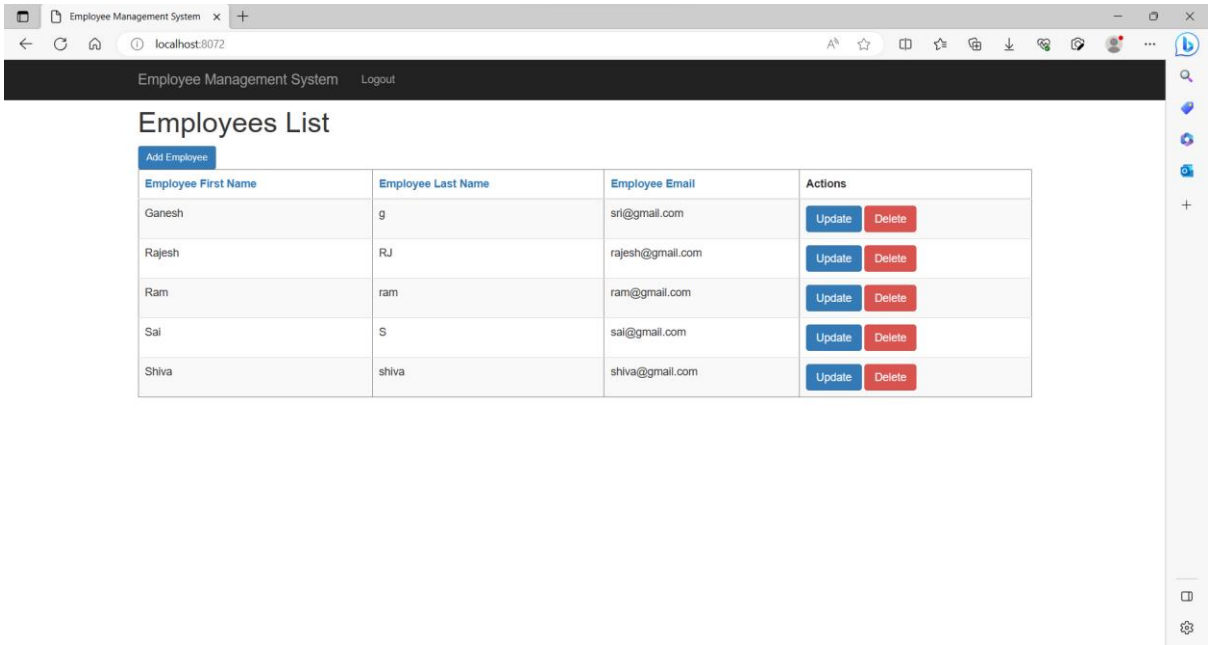


Update:

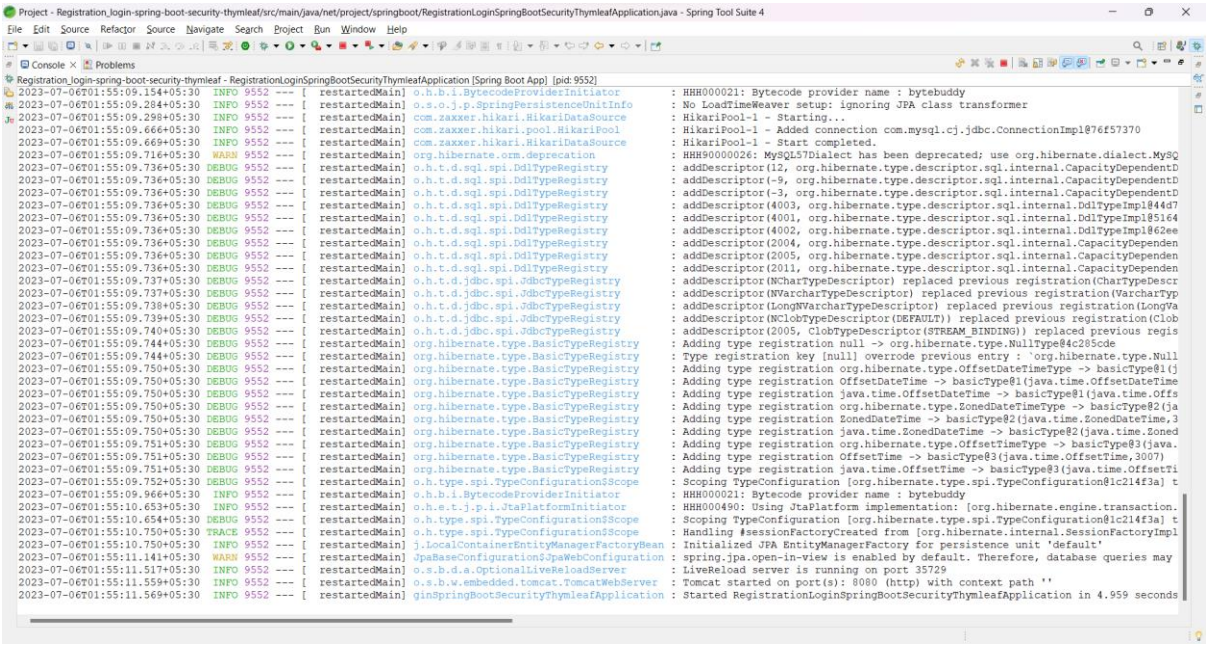




Deleting Rajeev :



Spring Boot Backend:



Conclusion:

The Employee Management System developed using react.js and Spring Boot provides an efficient and convenient solution for owner to manage employees and their operations. By automating the employee management process, the system improves overall efficiency. However, it is important to address security considerations and ensure reliable internet connectivity for optimal system performance.