EMPLOYEE MANAGEMENT APPLICATION

Introduction

The Employee Management System is a web-based application that enables seamless employee data management within an organization. The system allows administrators to perform CRUD operations on employee records, manage user accounts, assign roles, and handle user registration securely. Built using Spring Boot with Thymeleaf, it follows an MVC design pattern and integrates features like pagination, sorting, and user authentication.

Technology Stack

- Backend: Spring Boot (Java)
- Frontend: Thymeleaf (HTML, CSS, Bootstrap)
- Database: H2 Database / MySQL
- Security: Spring Security
- API Documentation: SpringDoc OpenAPI / Swagger

Core Functionalities

1. Employee Management

- Create, update, delete, and view employee records.
- Search employees with pagination and sorting features.
- View employee details on a user-friendly dashboard.

2. User Registration and Authentication

- New users can register their accounts via a registration page.
- Secure password storage using BCrypt hashing.
- Role-based access management (e.g., admin or user).

3. Role Management

- Users are assigned specific roles (ROLE_USER, ROLE_ADMIN).
- Roles determine the accessibility and visibility of system features.

4. Pagination and Sorting

- The application supports pagination for large data sets.
- Data can be sorted dynamically by various fields (e.g., first name, last name).

Usage Instructions

1. Setup

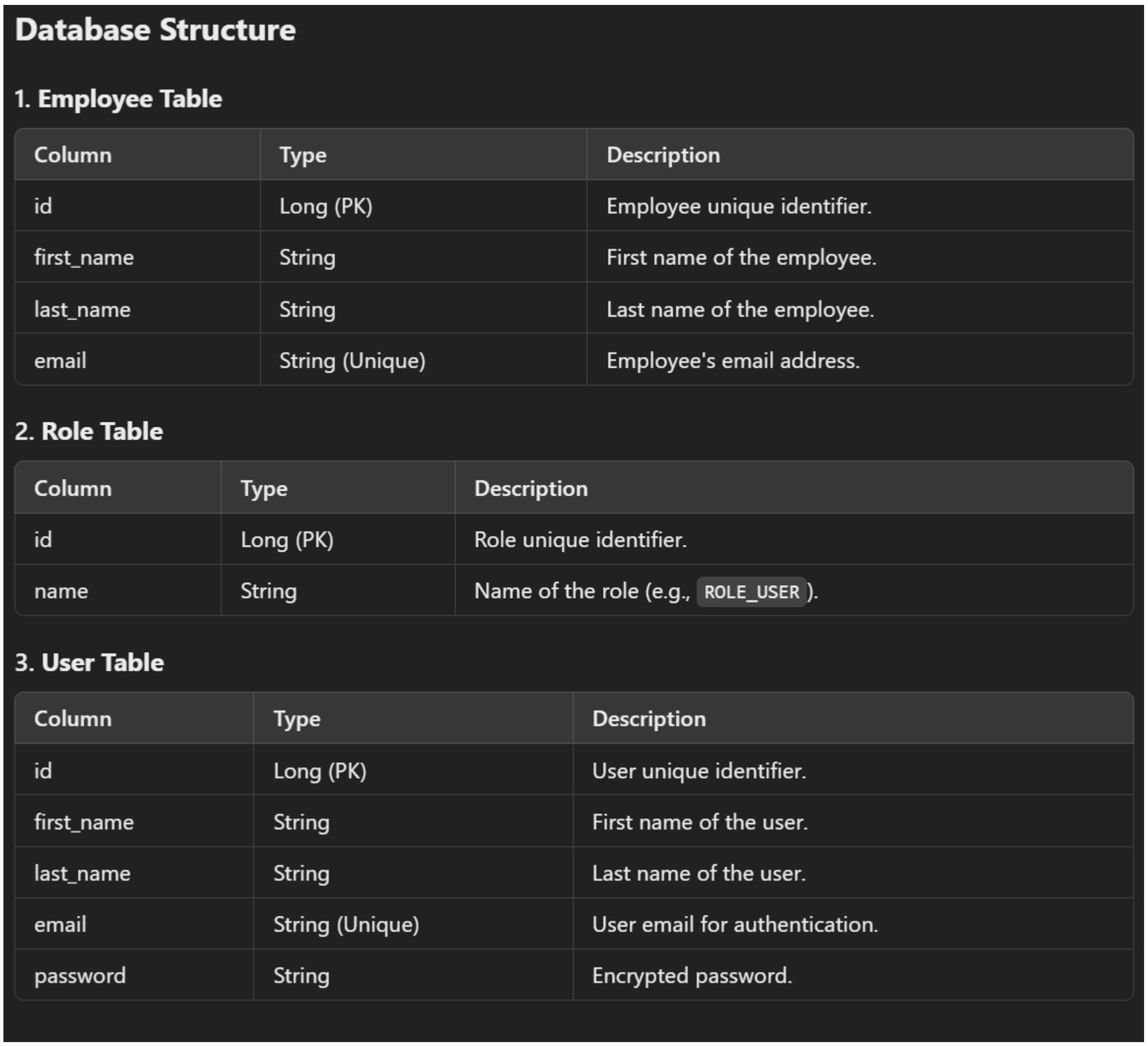
- Clone the project repository.
- Configure the database in the application.properties file.
- Run the application using an IDE or mvn spring-boot:run.

2. Access the Application

- Open the browser and navigate to http://localhost:8080.
- Use the registration page to create a new user or login with an existing account.

3. Managing Employees

- Add, update, or delete employee records from the dashboard.
- View paginated and sorted employee data.



Database Structure

1. Employee Table

Column	Type	Description
id	Long (PK)	Employee unique identifier.
first_name	String	First name of the employee.
last_name	String	Last name of the employee.
email	String (Unique)	Employee's email address.

2. Role Table

Column	Type	Description
id	Long (PK)	Role unique identifier.
name	String	Name of the role (e.g., `ROLE_USER`).

3. User Table

Column	Type	Description
id	Long (PK)	User unique identifier.
first_name	String	First name of the user.
last_name	String	Last name of the user.
email	String (Unique)	User email for authentication.
password	String	Encrypted password.

Controllers

EmployeeController

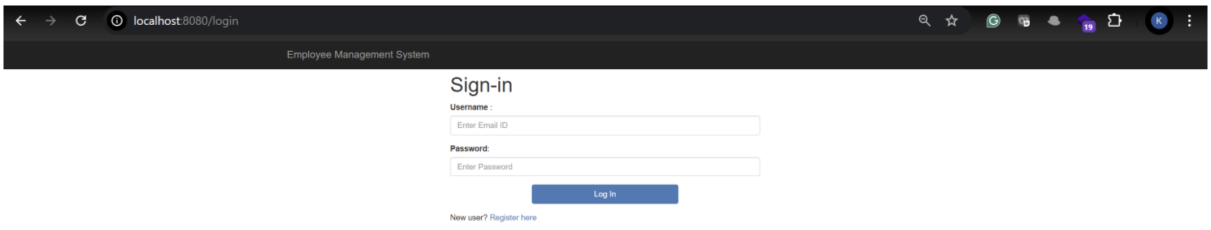
- Endpoints:
  - GET / - Displays the list of employees with pagination and sorting.
  - GET /showNewEmployeeForm - Renders the form to add a new employee.

  - POST /saveEmployee - Saves a new employee.
  - GET /showFormForUpdate/{id} - Displays a pre-filled form to update an employee.
  - GET /deleteEmployee/{id} - Deletes an employee by ID.
  - GET /page/{pageNo} - Fetches paginated data with sorting parameters.
- Thymeleaf Views:
  - index.html: Displays a list of employees.
  - new_employee.html: Form to add a new employee.
  - update_employee.html: Form to update existing employee details.

UserRegistrationController

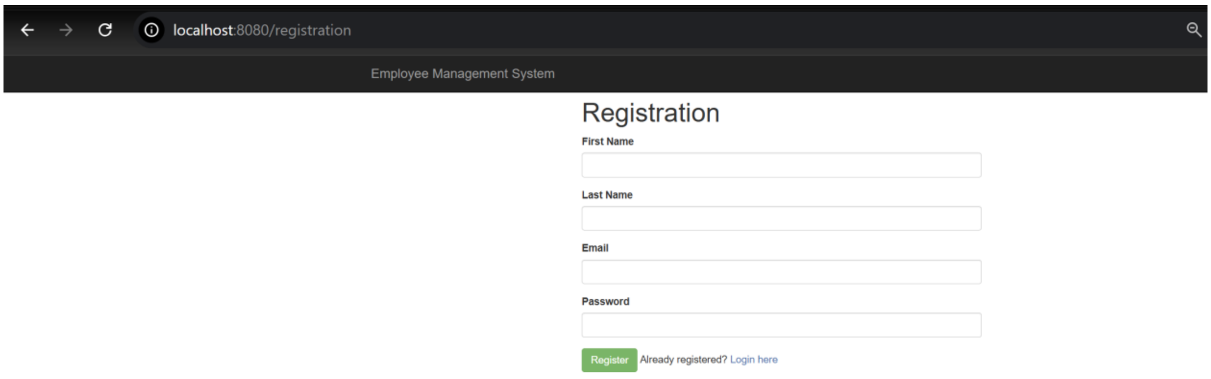
- Endpoints:
  - GET /registration - Renders the user registration form.
  - POST /registration - Handles new user registration.
- Thymeleaf Views:
  - registration.html: Form for new user registration.

Landing page

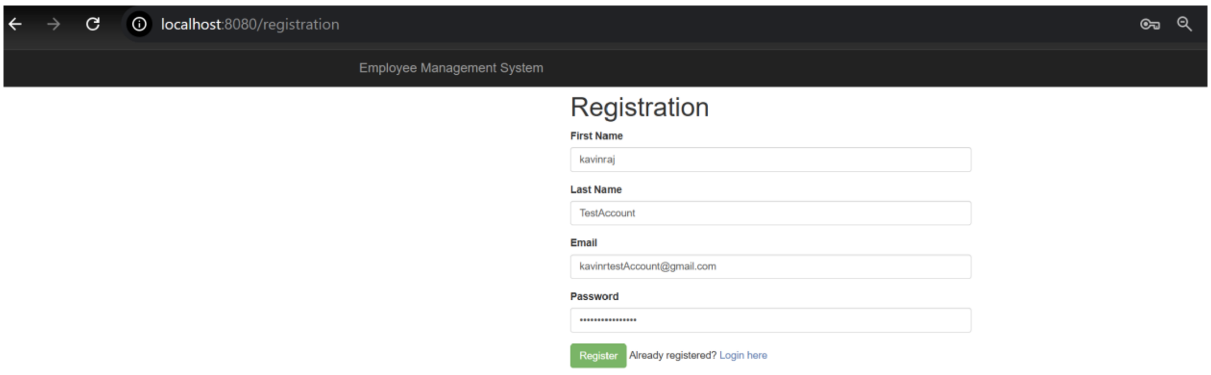


If you already have an account, you can directly provide your credentials and click 'Sign In' to log in.

Else By clicking register here button you can create an account

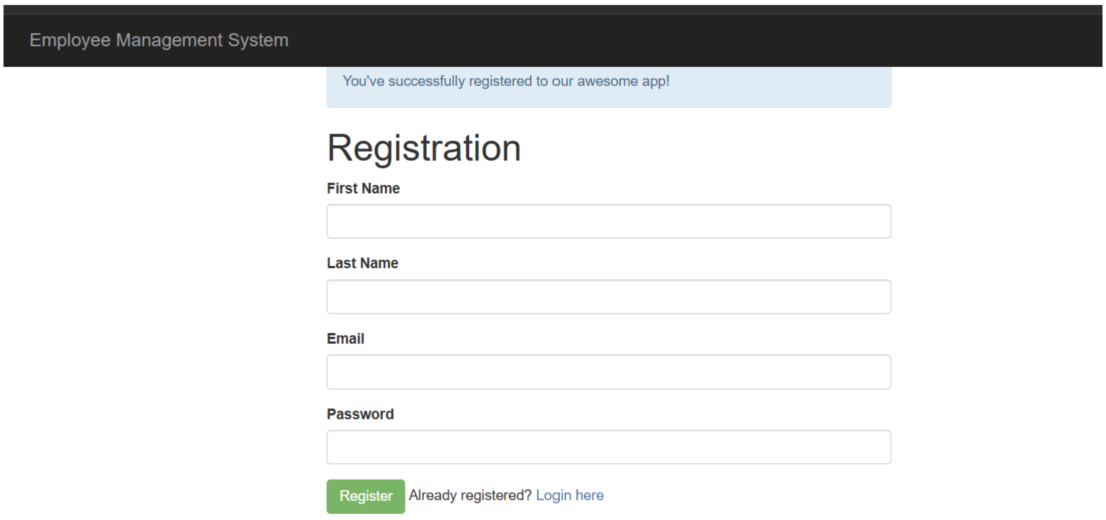

localhost:8080/registration
Employee Management System
Registration
First Name
Last Name
Email
Password
Register
Already registered? Login here

By providing all the information you can create an account


localhost:8080/registration
Employee Management System
Registration
Register
Already registered? Login here

First Name: kavinraj
Last Name: TestAccount
Email: kavinrtestAccount@gmail.com
Password: ••••••••••••••••

Once you click the Register button, you will get a popup like the one below then click on Login Here button to log in


Employee Management System

You've successfully registered to our awesome app!

Registration

First Name

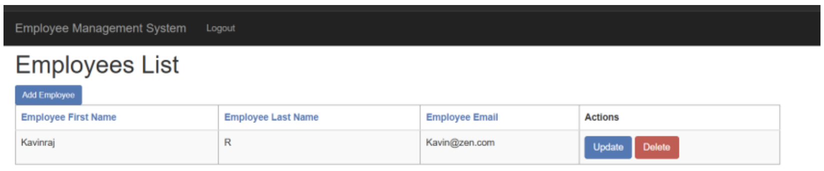
Last Name

Email

Password

Register Already registered? Login here

Home Page After Login

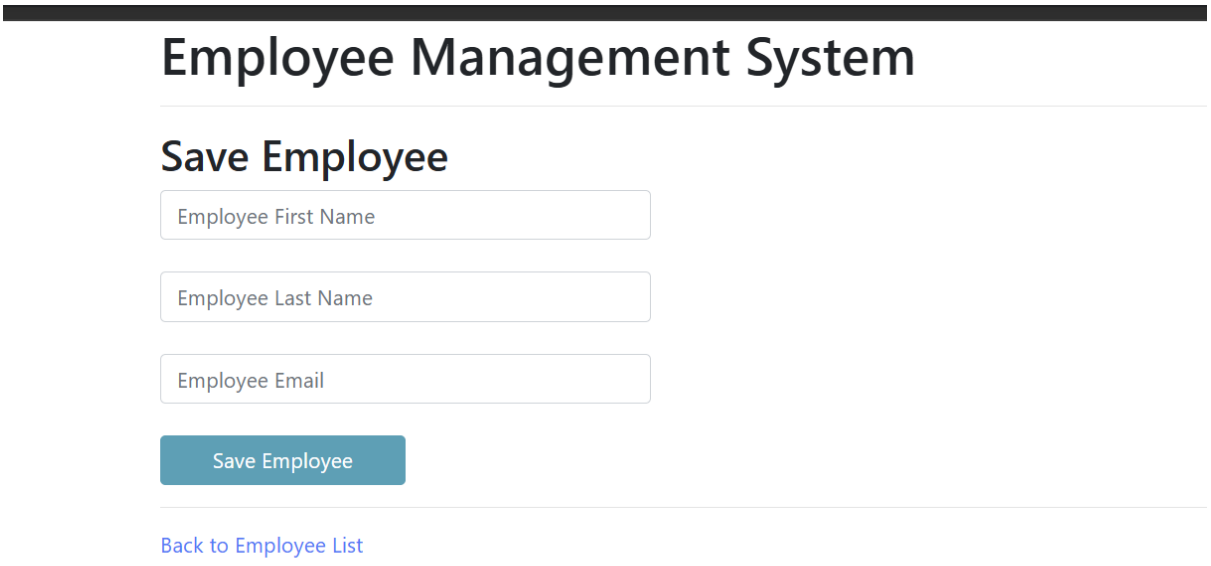

Employee Management System Logout

Employees List

Add Employee

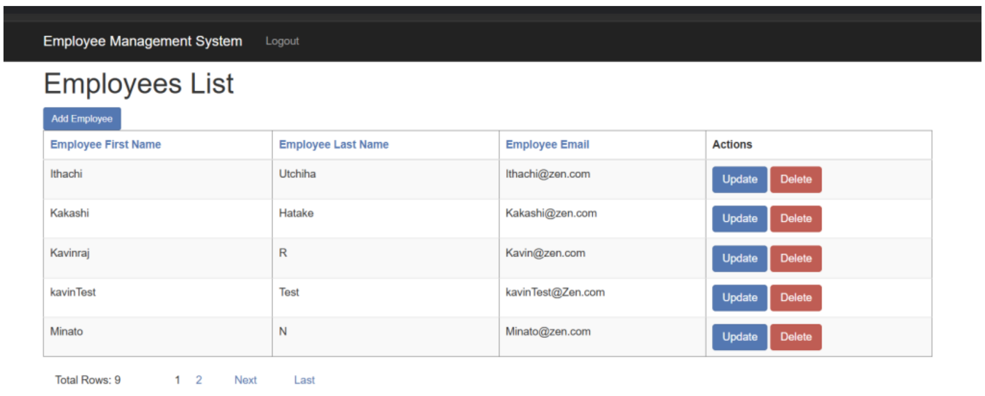
Employee First Name	Employee Last Name	Employee Email	Actions
Kavinraj	R	Kavin@zen.com	Update Delete

By clicking add employee button we can add an employee



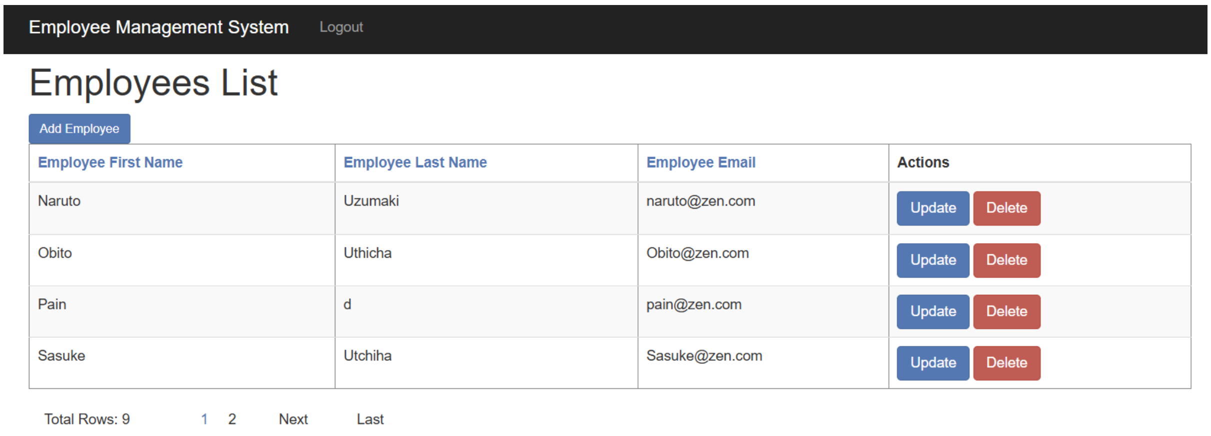
Fill in the employee details and click on the save employee button to the same employee details in DB

I have introduced the pagination so that we do not need to scroll infinite times, it's already sorted in ascending order and based on name we can click on the page number or next button.



Employee First Name	Employee Last Name	Employee Email	Actions
Ithachi	Utchiha	Ithachi@zen.com	Update Delete
Kakashi	Hatake	Kakashi@zen.com	Update Delete
Kavinraj	R	Kavin@zen.com	Update Delete
kavinTest	Test	kavinTest@Zen.com	Update Delete
Minato	N	Minato@zen.com	Update Delete

Total Rows: 9   1 2   Next   Last


Employee Management System Logout

Employees List

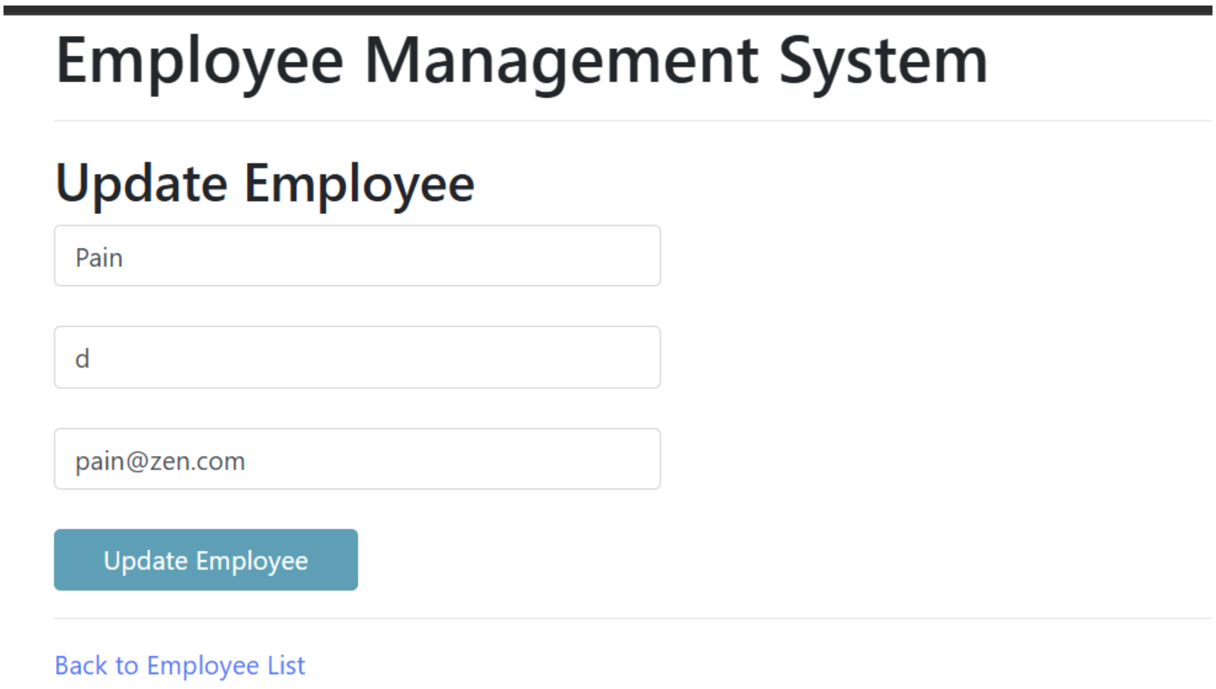
Add Employee

Employee First Name	Employee Last Name	Employee Email	Actions
Naruto	Uzumaki	naruto@zen.com	Update Delete
Obito	Uthicha	Obito@zen.com	Update Delete
Pain	d	pain@zen.com	Update Delete
Sasuke	Utchiha	Sasuke@zen.com	Update Delete

Total Rows: 9 1 2 Next Last

Update:

We can update/ edit the employee details by clicking the update button.


Employee Management System

Update Employee

Pain

d

pain@zen.com

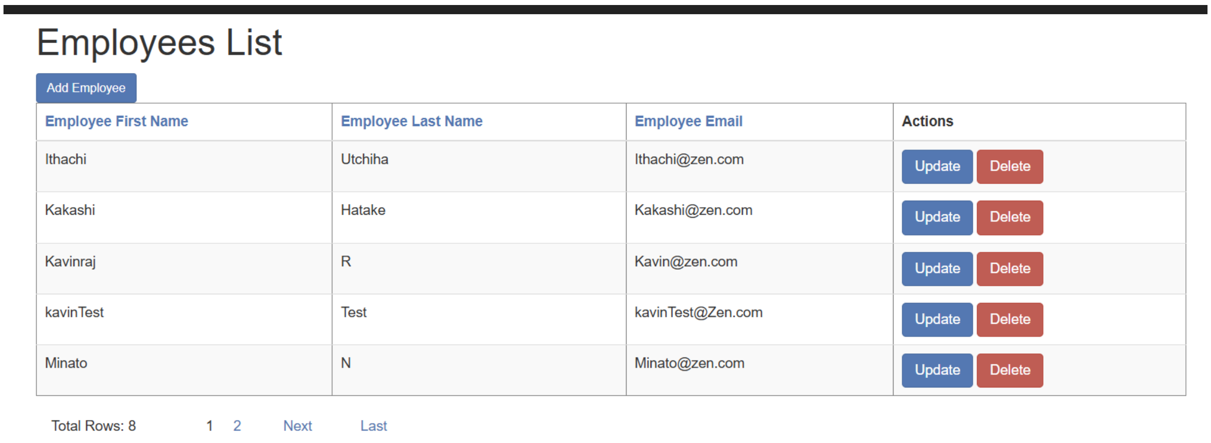
Update Employee

Back to Employee List

Delete:

we can delete the employee by clicking the delete button

After deleting count became 8 from 9

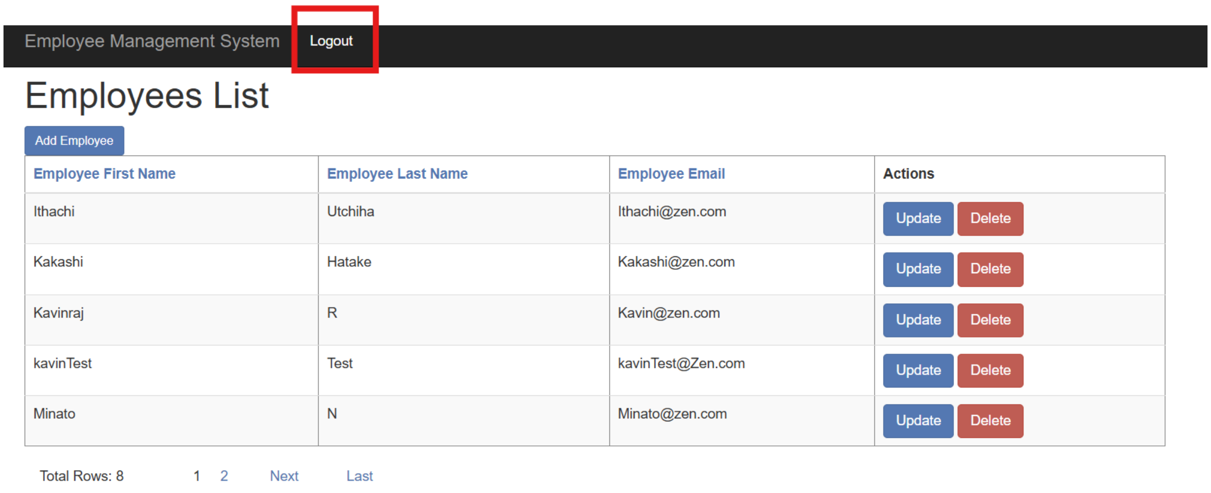


Employees List

Employee First Name	Employee Last Name	Employee Email	Actions
Ithachi	Utchiha	Ithachi@zen.com	Update Delete
Kakashi	Hatake	Kakashi@zen.com	Update Delete
Kavinraj	R	Kavin@zen.com	Update Delete
kavinTest	Test	kavinTest@Zen.com	Update Delete
Minato	N	Minato@zen.com	Update Delete

Total Rows: 8 1 2 Next Last

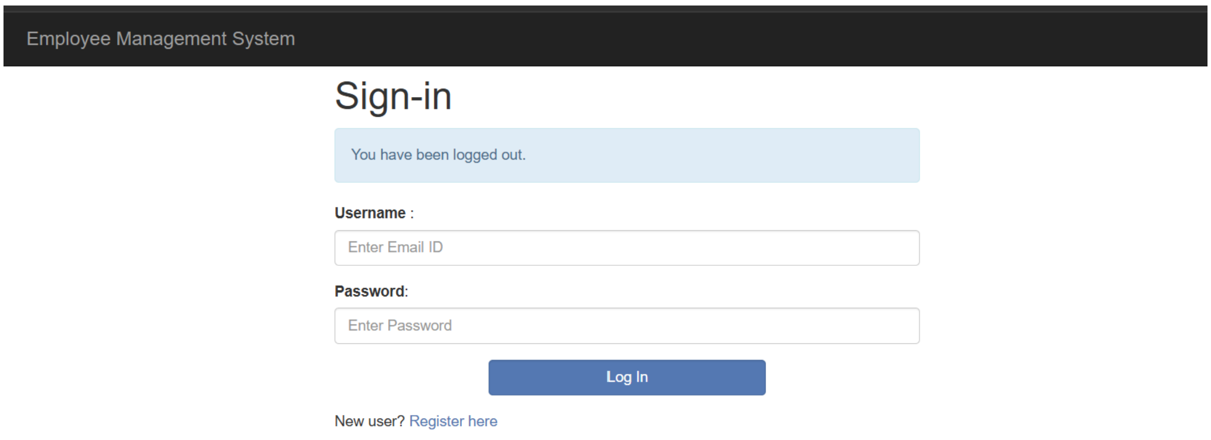
Logout:



Employees List

Employee First Name	Employee Last Name	Employee Email	Actions
Ithachi	Utchiha	Ithachi@zen.com	Update Delete
Kakashi	Hatake	Kakashi@zen.com	Update Delete
Kavinraj	R	Kavin@zen.com	Update Delete
kavinTest	Test	kavinTest@Zen.com	Update Delete
Minato	N	Minato@zen.com	Update Delete

Total Rows: 8 1 2 Next Last



Sign-in

You have been logged out.

Username : Enter Email ID

Password: Enter Password

New user? Register here

Swagger Api details

GET / - Display the homepage with a paginated list of employees.

GET /showNewEmployeeForm - Display a form to add a new employee.

POST /saveEmployee - Save the new employee data.

GET /showFormForUpdate/{id} - Display a form for updating an employee's details.

GET /deleteEmployee/{id} - Delete an employee by their ID.

GET /page/{pageNo} - Fetch paginated employee data with sort functionality.

GET /registration: Shows the registration form.

POST /registration: Handles the user registration by accepting user data and creating a new account. On successful registration, it redirects to the registration page with a success message (?success).

1. Employee Management

1.1 View All Employees

GET /
Description: Fetches a paginated and sorted list of employees.

- **Parameters:**
  - **pageNo (Query, Integer): The page number. Default: 1.**
  - **sortField (Query, String): Field to sort by. Default: firstName.**
  - **sortDir (Query, String): Sort direction (asc or desc). Default: asc.**
- **Response:**
  - **200 OK: List of employees with pagination details.**
  - **Example:**

JSON

CopyEdit

```
{
 "currentPage": 1,
 "totalPages": 5,
 "totalItems": 25,
 "listEmployees": [
  {
   "id": 1,
   "firstName": "John",
   "lastName": "Doe",
   "email": "john.doe@example.com"
  },
  ...
 ]
}
```

1.2 Add a New Employee

GET /showNewEmployeeForm
Description: Displays the form for adding a new employee.

POST /saveEmployee
Description: Saves a new employee to the database.

- **Request Body:**

JSON

CopyEdit

```json
{
  "firstName": "John",
  "lastName": "Doe",
  "email": "john.doe@example.com"
}
```

- **Response:**
  - **302 Redirect: Redirects to /.**

1.3 Update Employee Details

GET /showFormForUpdate/{id}
Description: Displays the form to update employee details.

- **Path Parameter:**
  - **id (Long): ID of the employee to update.**
- **Response:**
  - **200 OK: Returns the employee details for the given ID.**

1.4 Delete an Employee

GET /deleteEmployee/{id}
Description: Deletes an employee by ID.

- **Path Parameter:**
  - **id (Long): ID of the employee to delete.**
- **Response:**
  - **302 Redirect: Redirects to /.**

2. User Registration

2.1 User Registration Form

GET /registration
Description: Displays the user registration form.

2.2 Register a User

POST /registration
Description: Registers a new user.

- **Request Body:**

json

CopyEdit

```
{
  "firstName": "Jane",
  "lastName": "Doe",
  "email": "jane.doe@example.com",
  "password": "securePassword123"
}
```

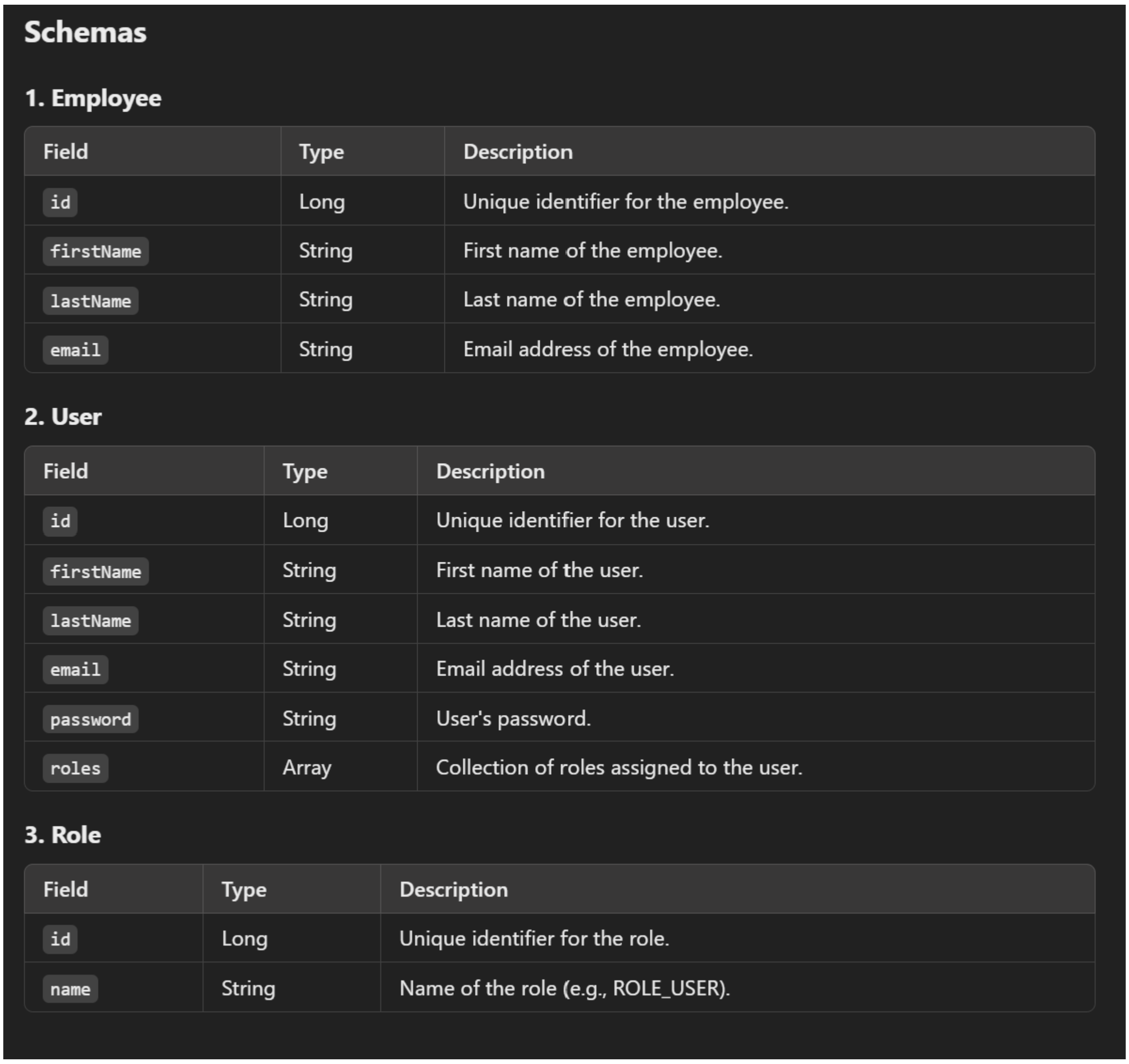
- **Response:**
  - **302 Redirect: Redirects to /registration?success.**

3. Pagination

GET /page/{pageNo}
Description: Fetches a paginated list of employees.

- **Path Parameter:**
  - **pageNo (Integer): Page number to retrieve.**
- **Query Parameters:**
  - **sortField (String): Field to sort by. Default: firstName.**
  - **sortDir (String): Sort direction (asc or desc). Default: asc.**
- **Response:**
  - **200 OK: Returns a list of employees with pagination and sorting details.**

Schemas



Schemas

1. Employee

Field	Type	Description
`id`	Long	Unique identifier for the employee.
`firstName`	String	First name of the employee.
`lastName`	String	Last name of the employee.
`email`	String	Email address of the employee.

2. User

Field	Type	Description
`id`	Long	Unique identifier for the user.
`firstName`	String	First name of the user.
`lastName`	String	Last name of the user.
`email`	String	Email address of the user.
`password`	String	User's password.
`roles`	Array	Collection of roles assigned to the user.

3. Role

Field	Type	Description
`id`	Long	Unique identifier for the role.
`name`	String	Name of the role (e.g., ROLE_USER).

1. Employee

Field	**Type**	**Description**
id	**Long**	**Unique identifier for the employee.**
firstName	**String**	**First name of the employee.**
lastName	**String**	**Last name of the employee.**
email	**String**	**Email address of the employee.**

2. User

Field	**Type**	**Description**
id	**Long**	**Unique identifier for the user.**
firstName	**String**	**First name of the user.**
lastName	**String**	**Last name of the user.**
email	**String**	**Email address of the user.**
password	**String**	**User's password.**
roles	**Array**	**Collection of roles assigned to the user.**

3. Role

Field	**Type**	**Description**
id	**Long**	**Unique identifier for the role.**
name	**String**	**Name of the role (e.g., ROLE_USER).**

Error Responses

- **404 Not Found: When an employee or user is not found.**
  - **Example:**

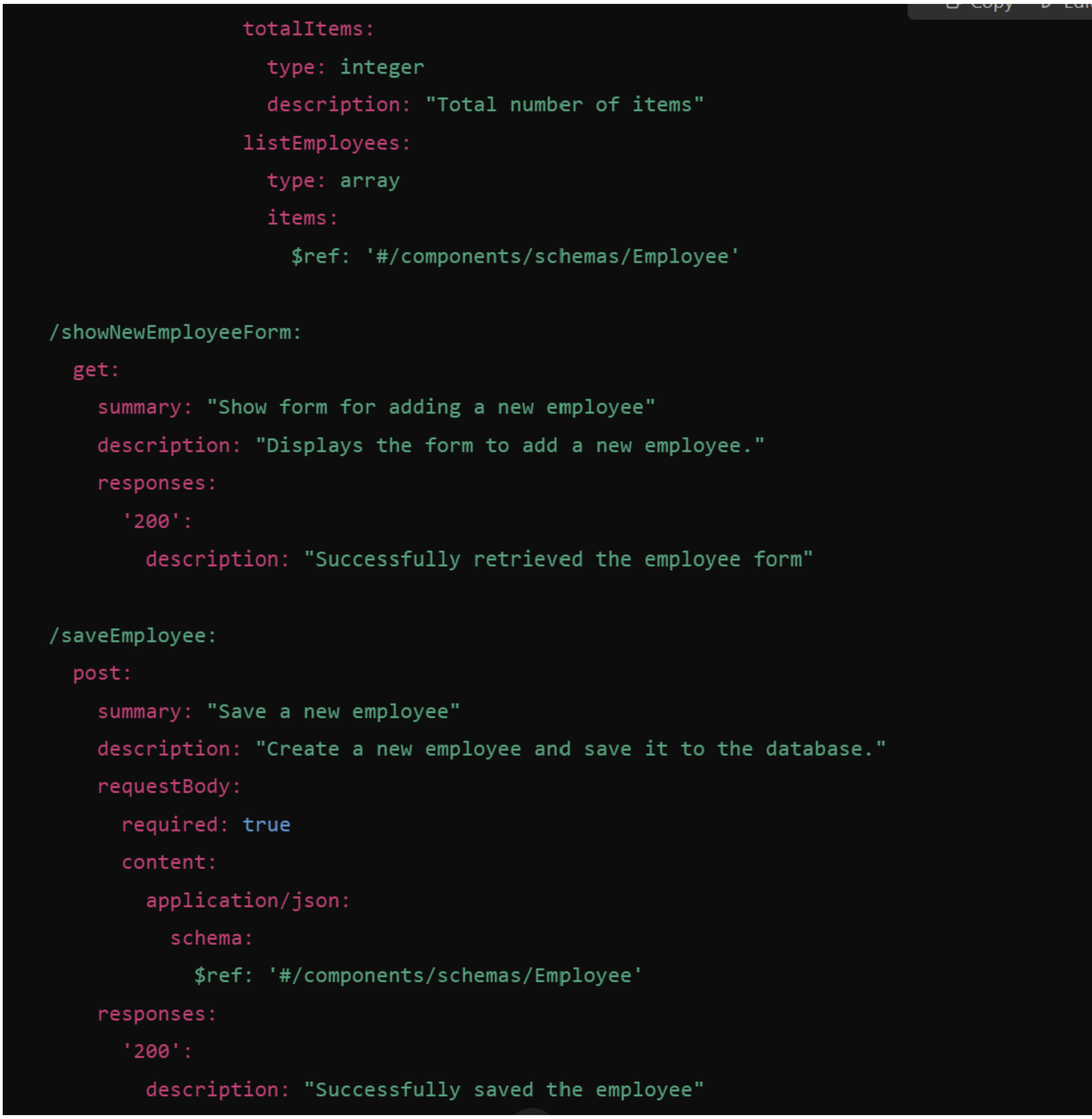
JSON

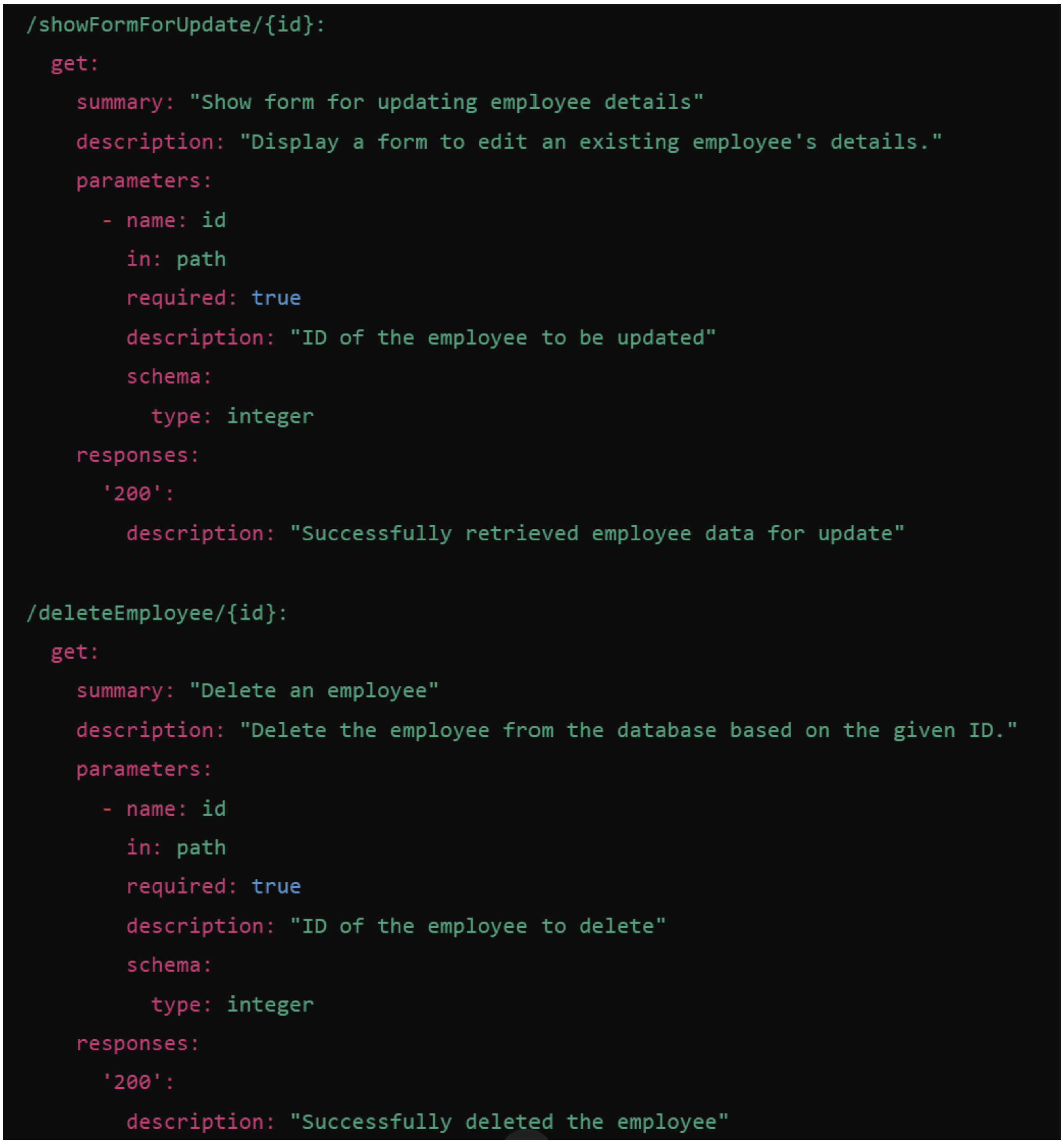
CopyEdit

```json
{
  "timestamp": "2025-01-26T12:00:00Z",
  "status": 404,
  "error": "Not Found",
  "message": "Employee not found for id :: 1",
  "path": "/showFormForUpdate/1"
}
```

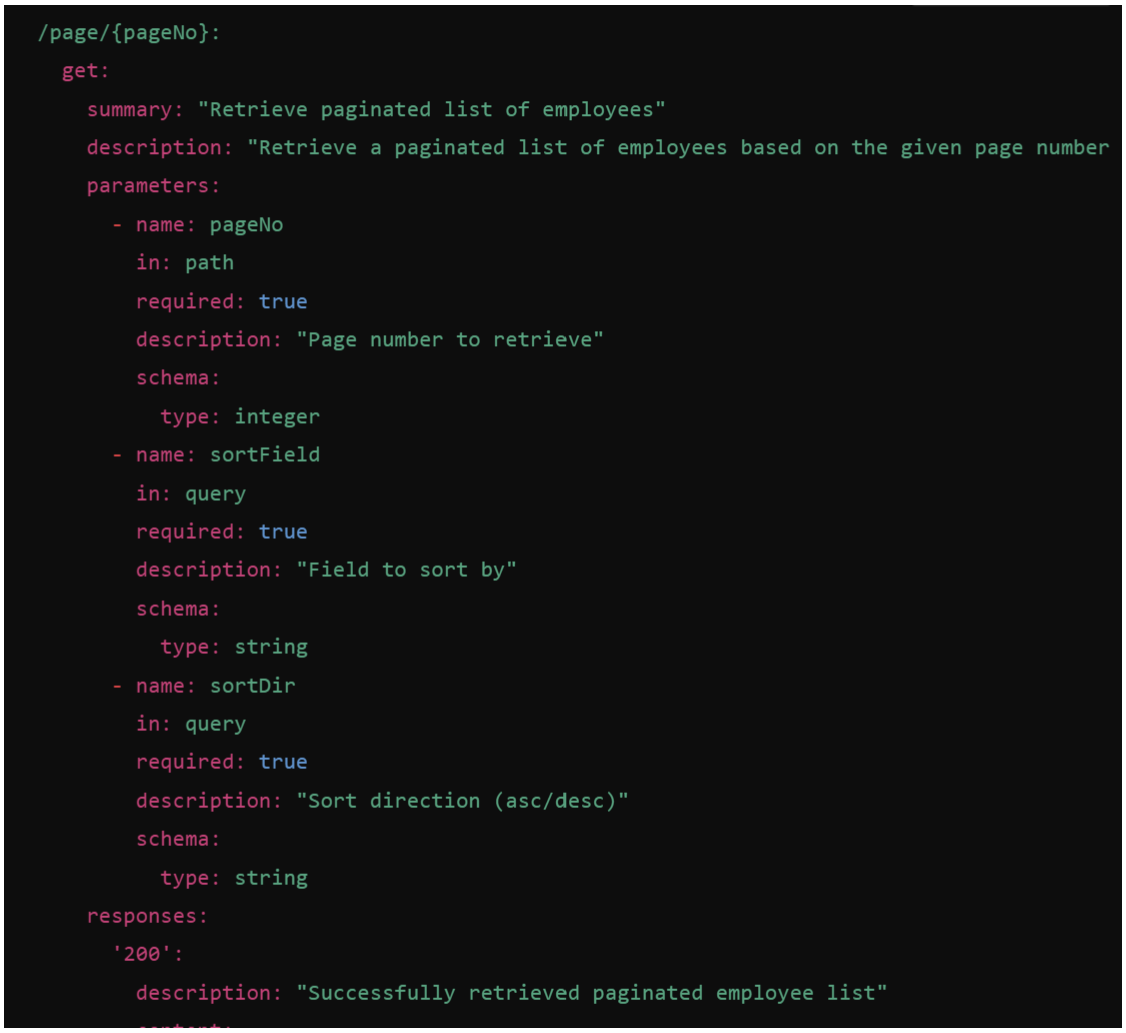
- **400 Bad Request: For invalid input data.**
- **500 Internal Server Error: For unexpected server issues.**

```yaml
openapi: 3.0.0
info:
  title: Employee Management System API
  description: API documentation for managing employees
  version: 1.0.0
servers:
  - url: 'http://localhost:8080'
paths:
  /:
    get:
      summary: "Display list of employees"
      description: "Retrieve the homepage that lists employees in a paginated format."
      responses:
        '200':
          description: "Successfully retrieved list of employees"
          content:
            application/json:
              schema:
                type: object
                properties:
                  currentPage:
                    type: integer
                    description: "Current page number"
                  totalPages:
                    type: integer
                    description: "Total pages available"
```

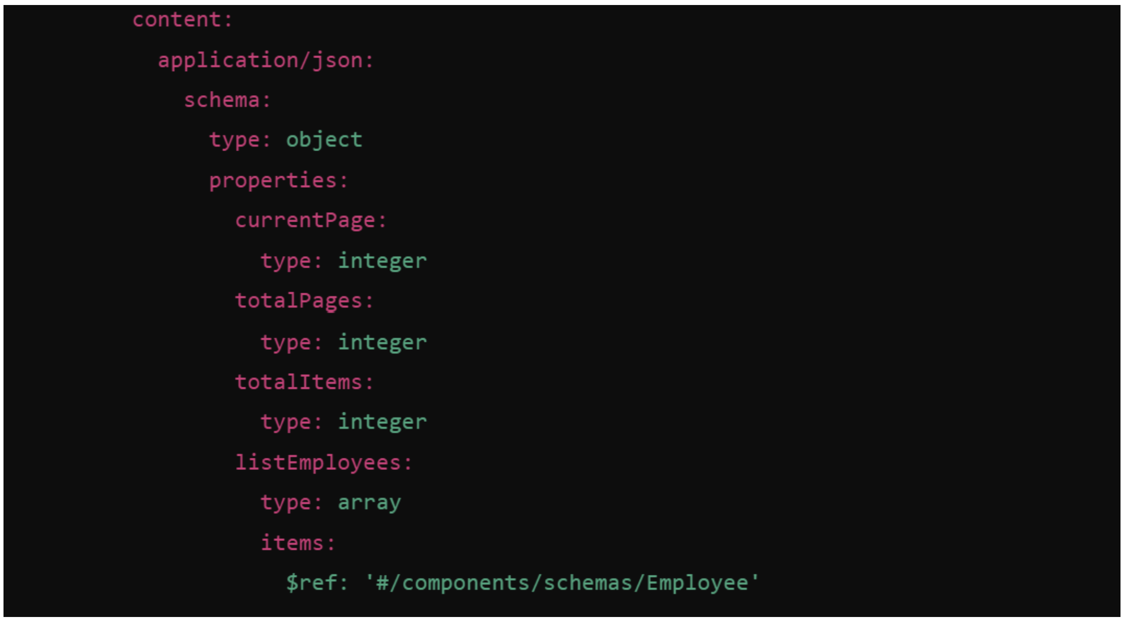

```yaml
                totalItems:
                  type: integer
                  description: "Total number of items"
                listEmployees:
                  type: array
                  items:
                    $ref: '#/components/schemas/Employee'

/showNewEmployeeForm:
  get:
    summary: "Show form for adding a new employee"
    description: "Displays the form to add a new employee."
    responses:
      '200':
        description: "Successfully retrieved the employee form"

/saveEmployee:
  post:
    summary: "Save a new employee"
    description: "Create a new employee and save it to the database."
    requestBody:
      required: true
      content:
        application/json:
          schema:
            $ref: '#/components/schemas/Employee'
    responses:
      '200':
        description: "Successfully saved the employee"
```



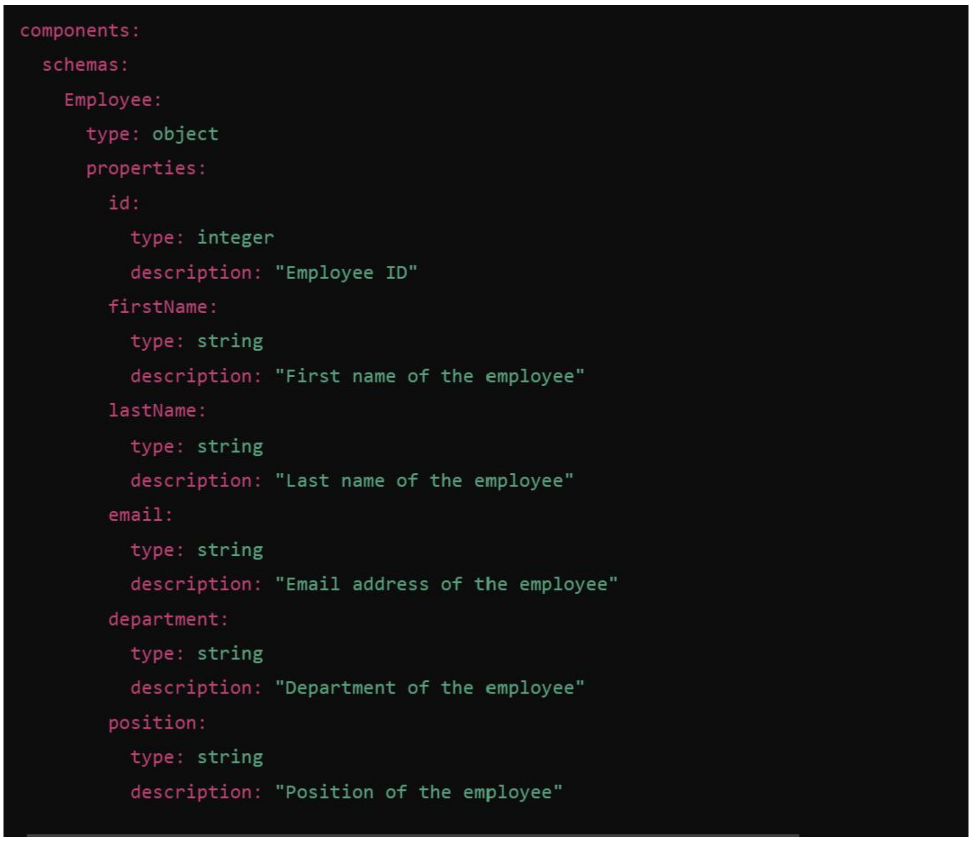
```yaml
/showFormForUpdate/{id}:
  get:
    summary: "Show form for updating employee details"
    description: "Display a form to edit an existing employee's details."
    parameters:
      - name: id
        in: path
        required: true
        description: "ID of the employee to be updated"
        schema:
          type: integer
    responses:
      '200':
        description: "Successfully retrieved employee data for update"

/deleteEmployee/{id}:
  get:
    summary: "Delete an employee"
    description: "Delete the employee from the database based on the given ID."
    parameters:
      - name: id
        in: path
        required: true
        description: "ID of the employee to delete"
        schema:
          type: integer
    responses:
      '200':
        description: "Successfully deleted the employee"
```



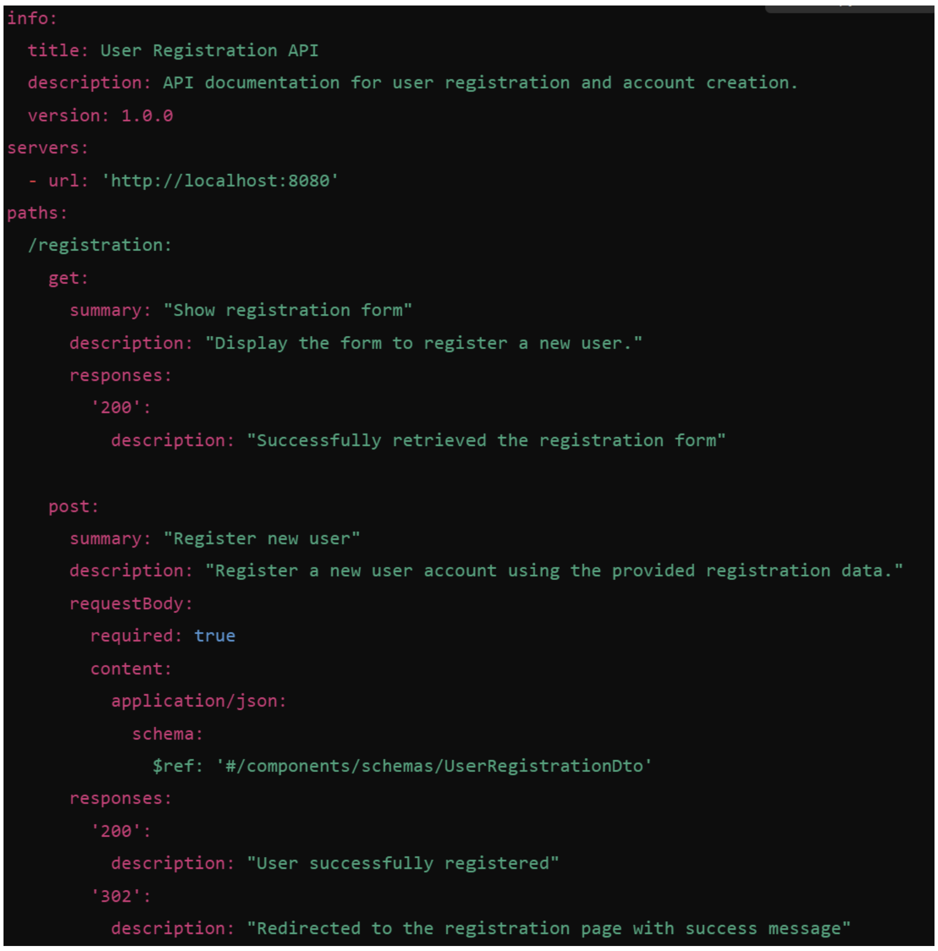
```yaml
/page/{pageNo}:
  get:
    summary: "Retrieve paginated list of employees"
    description: "Retrieve a paginated list of employees based on the given page number
    parameters:
      - name: pageNo
        in: path
        required: true
        description: "Page number to retrieve"
        schema:
          type: integer
      - name: sortField
        in: query
        required: true
        description: "Field to sort by"
        schema:
          type: string
      - name: sortDir
        in: query
        required: true
        description: "Sort direction (asc/desc)"
        schema:
          type: string
    responses:
      '200':
        description: "Successfully retrieved paginated employee list"
```



```yaml
        content:
          application/json:
            schema:
              type: object
              properties:
                currentPage:
                  type: integer
                totalPages:
                  type: integer
                totalItems:
                  type: integer
                listEmployees:
                  type: array
                  items:
                    $ref: '#/components/schemas/Employee'
```



```yaml
components:
  schemas:
    Employee:
      type: object
      properties:
        id:
          type: integer
          description: "Employee ID"
        firstName:
          type: string
          description: "First name of the employee"
        lastName:
          type: string
          description: "Last name of the employee"
        email:
          type: string
          description: "Email address of the employee"
        department:
          type: string
          description: "Department of the employee"
        position:
          type: string
          description: "Position of the employee"
```



```yaml
info:
  title: User Registration API
  description: API documentation for user registration and account creation.
  version: 1.0.0
servers:
  - url: 'http://localhost:8080'
paths:
  /registration:
    get:
      summary: "Show registration form"
      description: "Display the form to register a new user."
      responses:
        '200':
          description: "Successfully retrieved the registration form"

    post:
      summary: "Register new user"
      description: "Register a new user account using the provided registration data."
      requestBody:
        required: true
        content:
          application/json:
            schema:
              $ref: '#/components/schemas/UserRegistrationDto'
      responses:
        '200':
          description: "User successfully registered"
        '302':
          description: "Redirected to the registration page with success message"
```

```yaml
components:
  schemas:
    UserRegistrationDto:
      type: object
      properties:
        firstName:
          type: string
          description: "First name of the user"
        lastName:
          type: string
          description: "Last name of the user"
        email:
          type: string
          description: "Email address of the user"
        password:
          type: string
          description: "Password for the user account"
        confirmPassword:
          type: string
          description: "Confirmation password to match the password"
      required:
        - firstName
        - lastName
        - email
        - password
        - confirmPassword
```

```yaml
openapi: 3.0.0
info:
 title: Employee Management System API
 description: API documentation for managing employees
 version: 1.0.0
servers:
 - url: 'http://localhost:8080'
paths:
 /:
  get:
   summary: "Display list of employees"
```

```yaml
      description: "Retrieve the homepage that lists employees in a paginated format."
      responses:
        '200':
          description: "Successfully retrieved list of employees"
          content:
            application/json:
              schema:
                type: object
                properties:
                  currentPage:
                    type: integer
                    description: "Current page number"
                  totalPages:
                    type: integer
                    description: "Total pages available"
                  totalItems:
                    type: integer
                    description: "Total number of items"
                  listEmployees:
                    type: array
                    items:
                      $ref: '#/components/schemas/Employee'

  /showNewEmployeeForm:
    get:
      summary: "Show form for adding a new employee"
      description: "Displays the form to add a new employee."
      responses:
        '200':
          description: "Successfully retrieved the employee form"
```

```yaml
/saveEmployee:
 post:
  summary: "Save a new employee"
  description: "Create a new employee and save it to the database."
  requestBody:
   required: true
   content:
    application/json:
     schema:
      $ref: '#/components/schemas/Employee'
  responses:
   '200':
    description: "Successfully saved the employee"

/showFormForUpdate/{id}:
 get:
  summary: "Show form for updating employee details"
  description: "Display a form to edit an existing employee's details."
  parameters:
   - name: id
    in: path
    required: true
    description: "ID of the employee to be updated"
    schema:
     type: integer
  responses:
   '200':
    description: "Successfully retrieved employee data for update"

/deleteEmployee/{id}:
 get:
    summary: "Delete an employee"
    description: "Delete the employee from the database based on the given ID."
    parameters:
     - name: id
      in: path
      required: true
      description: "ID of the employee to delete"
      schema:
       type: integer
    responses:
     '200':
      description: "Successfully deleted the employee"

  /page/{pageNo}:
   get:
    summary: "Retrieve paginated list of employees"
    description: "Retrieve a paginated list of employees based on the given page number
and sort parameters."
    parameters:
     - name: pageNo
      in: path
      required: true
      description: "Page number to retrieve"
      schema:
       type: integer
     - name: sortField
      in: query
      required: true
      description: "Field to sort by"
      schema:
       type: string
```

```yaml
        - name: sortDir
          in: query
          required: true
          description: "Sort direction (asc/desc)"
          schema:
            type: string
      responses:
        '200':
          description: "Successfully retrieved paginated employee list"
          content:
            application/json:
              schema:
                type: object
                properties:
                  currentPage:
                    type: integer
                  totalPages:
                    type: integer
                  totalItems:
                    type: integer
                  listEmployees:
                    type: array
                    items:
                      $ref: '#/components/schemas/Employee'

components:
  schemas:
    Employee:
      type: object
      properties:
        id:
          type: integer
          description: "Employee ID"
        firstName:
          type: string
          description: "First name of the employee"
        lastName:
          type: string
          description: "Last name of the employee"
        email:
          type: string
          description: "Email address of the employee"
        department:
          type: string
          description: "Department of the employee"
        position:
          type: string
          description: "Position of the employee"
```

```
openapi: 3.0.0
info:
  title: User Registration API
  description: API documentation for user registration and account creation.
  version: 1.0.0
servers:
  - url: 'http://localhost:8080'
paths:
  /registration:
    get:
      summary: "Show registration form"
      description: "Display the form to register a new user."
      responses:
```

```yaml
    '200':
     description: "Successfully retrieved the registration form"

  post:
   summary: "Register new user"
   description: "Register a new user account using the provided registration data."
   requestBody:
    required: true
    content:
     application/json:
      schema:
       $ref: '#/components/schemas/UserRegistrationDto'
   responses:
    '200':
     description: "User successfully registered"
    '302':
     description: "Redirected to the registration page with success message"

components:
 schemas:
  UserRegistrationDto:
   type: object
   properties:
    firstName:
     type: string
     description: "First name of the user"
    lastName:
     type: string
     description: "Last name of the user"
    email:
     type: string
```

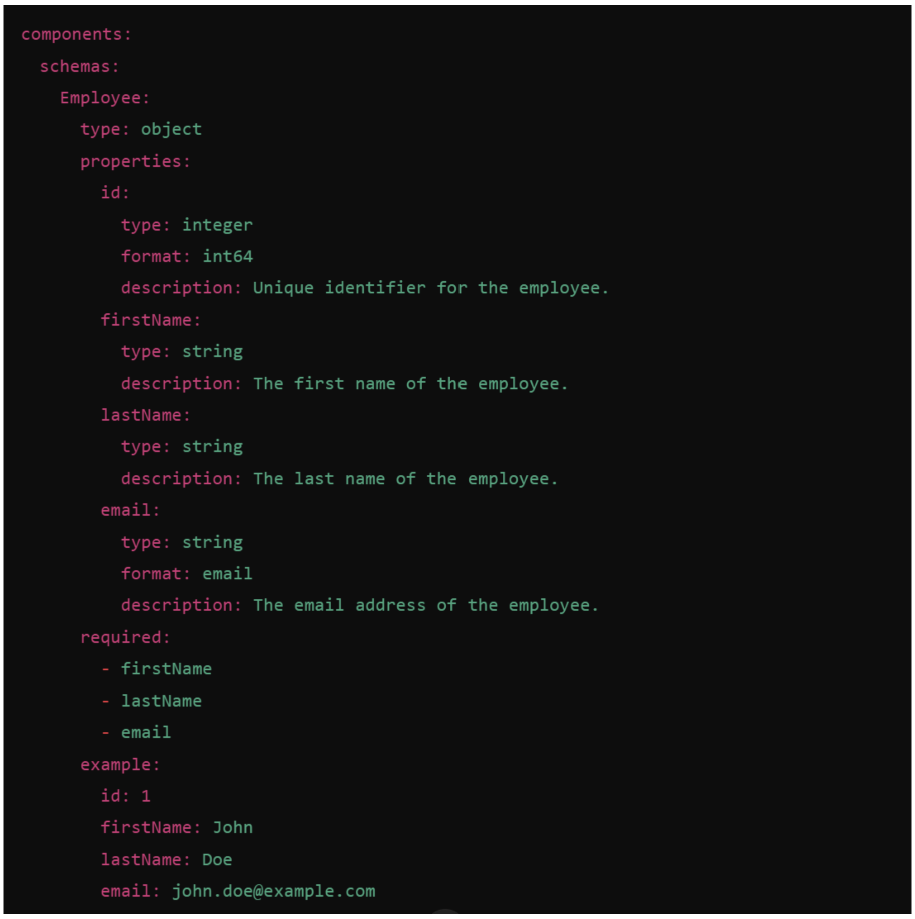
```
      description: "Email address of the user"
    password:
      type: string
      description: "Password for the user account"
    confirmPassword:
      type: string
      description: "Confirmation password to match the password"
  required:
    - firstName
    - lastName
    - email
    - password
    - confirmPassword
```

Schema Structure

Schema Name: Employee

Fields:

- **id: Auto-generated unique identifier for the employee.**
- **firstName: First name of the employee (required).**
- **lastName: Last name of the employee (required).**
- **email: Email address of the employee (required, in email format).**



```yaml
components:
  schemas:
    Employee:
      type: object
      properties:
        id:
          type: integer
          format: int64
          description: Unique identifier for the employee.
        firstName:
          type: string
          description: The first name of the employee.
        lastName:
          type: string
          description: The last name of the employee.
        email:
          type: string
          format: email
          description: The email address of the employee.
      required:
        - firstName
        - lastName
        - email
      example:
        id: 1
        firstName: John
        lastName: Doe
        email: john.doe@example.com
```

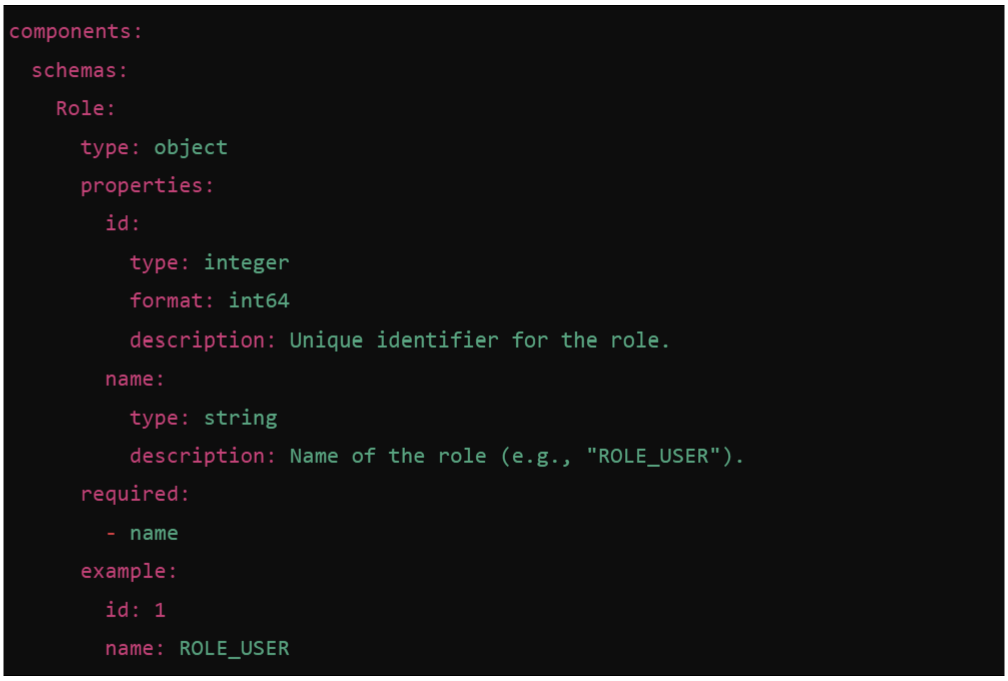
```
components:
 schemas:
  Employee:
   type: object
   properties:
```

```
  id:
    type: integer
    format: int64
    description: Unique identifier for the employee.
  firstName:
    type: string
    description: The first name of the employee.
  lastName:
    type: string
    description: The last name of the employee.
  email:
    type: string
    format: email
    description: The email address of the employee.
required:
  - firstName
  - lastName
  - email
example:
  id: 1
  firstName: John
  lastName: Doe
  email: john.doe@example.com
```

Schema Name: Role

Fields:

- **id: Auto-generated unique identifier for the role.**
- **name: Name of the role (e.g., "ROLE_USER", "ROLE_ADMIN") (required).**



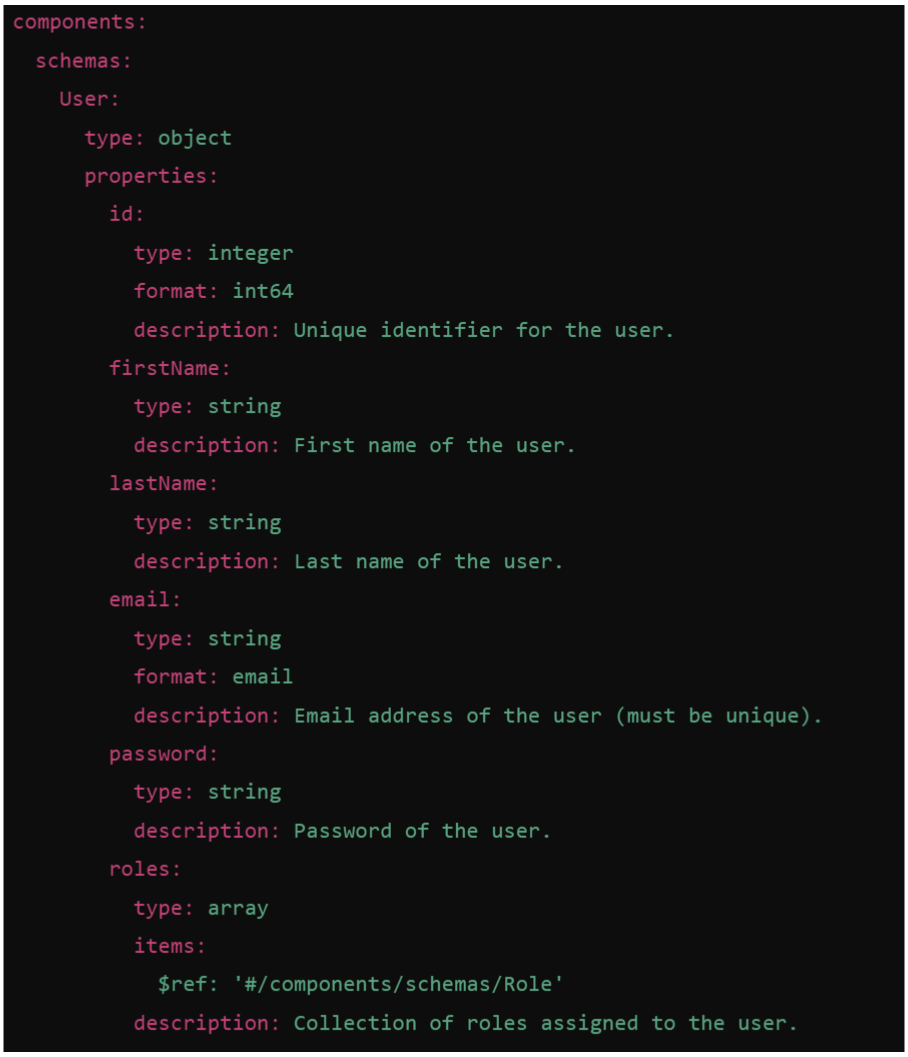
```yaml
components:
  schemas:
    Role:
      type: object
      properties:
        id:
          type: integer
          format: int64
          description: Unique identifier for the role.
        name:
          type: string
          description: Name of the role (e.g., "ROLE_USER").
      required:
        - name
      example:
        id: 1
        name: ROLE_USER
```

```yaml
components:
 schemas:
  Role:
   type: object
   properties:
    id:
     type: integer
     format: int64
     description: Unique identifier for the role.
    name:
     type: string
     description: Name of the role (e.g., "ROLE_USER").
   required:
    - name
   example:
    id: 1
    name: ROLE_USER
```

Schema Name: User

Fields:

- **id: Auto-generated unique identifier for the user.**
- **firstName: First name of the user (required).**
- **lastName: Last name of the user (required).**
- **email: Email address (must be unique and required).**
- **password: Password for the user's account (required).**
- **roles: Array of roles assigned to the user, referencing the Role schema.**



```yaml
components:
  schemas:
    User:
      type: object
      properties:
        id:
          type: integer
          format: int64
          description: Unique identifier for the user.
        firstName:
          type: string
          description: First name of the user.
        lastName:
          type: string
          description: Last name of the user.
        email:
          type: string
          format: email
          description: Email address of the user (must be unique).
        password:
          type: string
          description: Password of the user.
        roles:
          type: array
          items:
            $ref: '#/components/schemas/Role'
          description: Collection of roles assigned to the user.
  required:
    - firstName
    - lastName
    - email
    - password
  example:
    id: 1
    firstName: John
    lastName: Doe
    email: john.doe@example.com
    password: securePassword123
    roles:
      - id: 1
        name: ROLE_USER
```

```yaml
components:
 schemas:
  User:
   type: object
   properties:
    id:
     type: integer
     format: int64
     description: Unique identifier for the user.
    firstName:
     type: string
     description: First name of the user.
    lastName:
     type: string
     description: Last name of the user.
    email:
     type: string
     format: email
     description: Email address of the user (must be unique).
    password:
     type: string
```

```
      description: Password of the user.
     roles:
      type: array
      items:
       $ref: '#/components/schemas/Role'
      description: Collection of roles assigned to the user.
    required:
     - firstName
     - lastName
     - email
     - password
    example:
     id: 1
     firstName: John
     lastName: Doe
     email: john.doe@example.com
     password: securePassword123
     roles:
      - id: 1
       name: ROLE_USER
```

Conclusion

This Employee Management System serves as a robust foundation for managing employee data in an organization. Its modular design allows for easy scalability and integration with other services. The application leverages Spring Boot for seamless development, Spring Security for authentication, and Thymeleaf for dynamic HTML content rendering.