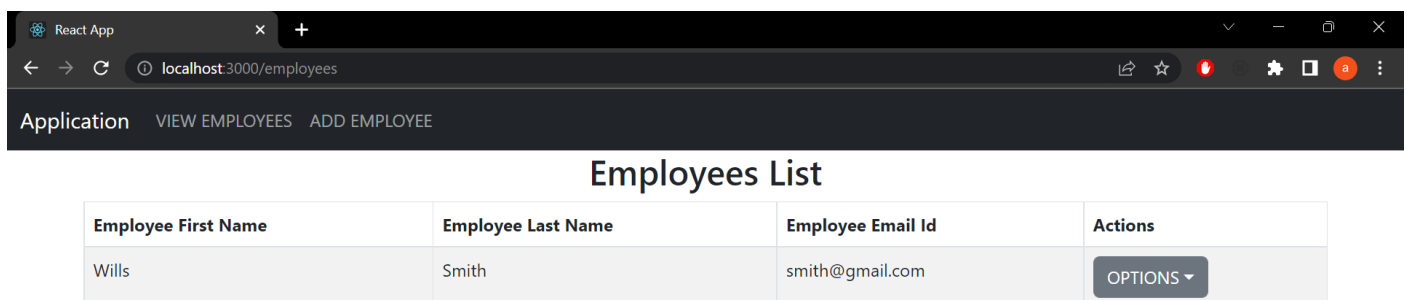
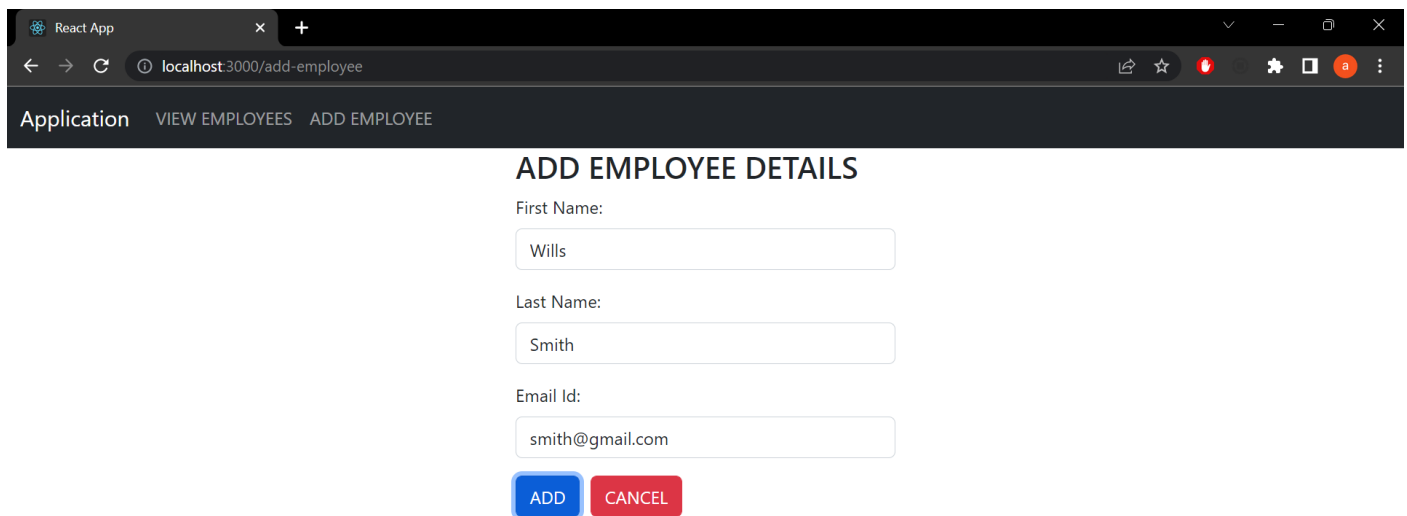
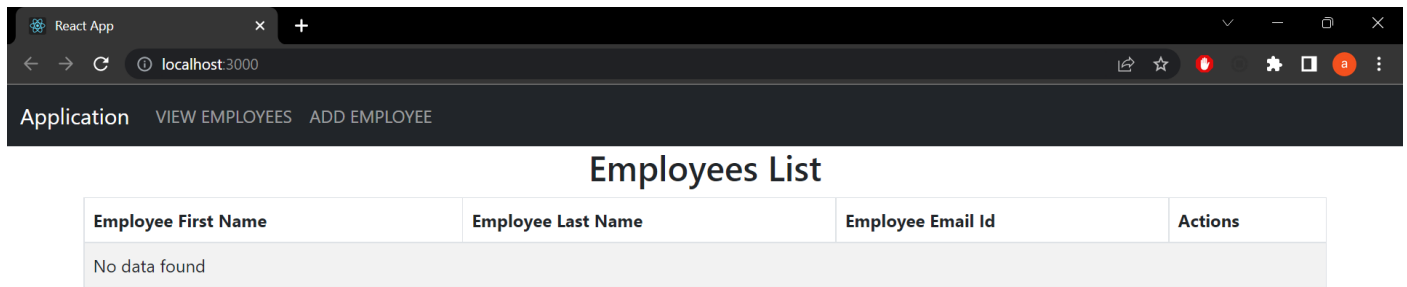


Integration of React and Spring Boot



React App

localhost:3000/employees

Application VIEW EMPLOYEES ADD EMPLOYEE

Employees List

Employee First Name	Employee Last Name	Employee Email Id	Actions
Wills	Smith	smith@gmail.com	<div>OPTIONS</div> <div>UPDATE</div> <div>DELETE</div> <div>VIEW</div>

React App

localhost:3000/update-employee/15

Application VIEW EMPLOYEES ADD EMPLOYEE

UPDATE EMPLOYEE

First Name:

Last Name:

Email Id:

React App

localhost:3000/update-employee/15

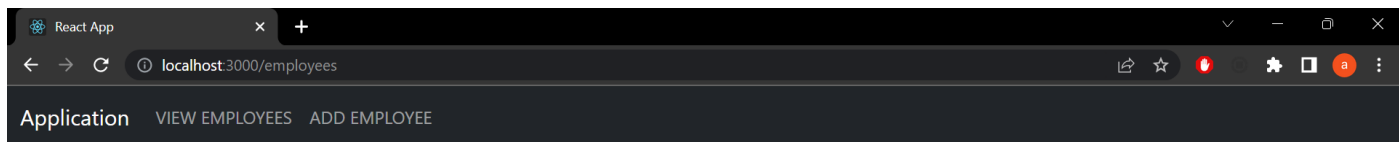
Application VIEW EMPLOYEES ADD EMPLOYEE

UPDATE EMPLOYEE

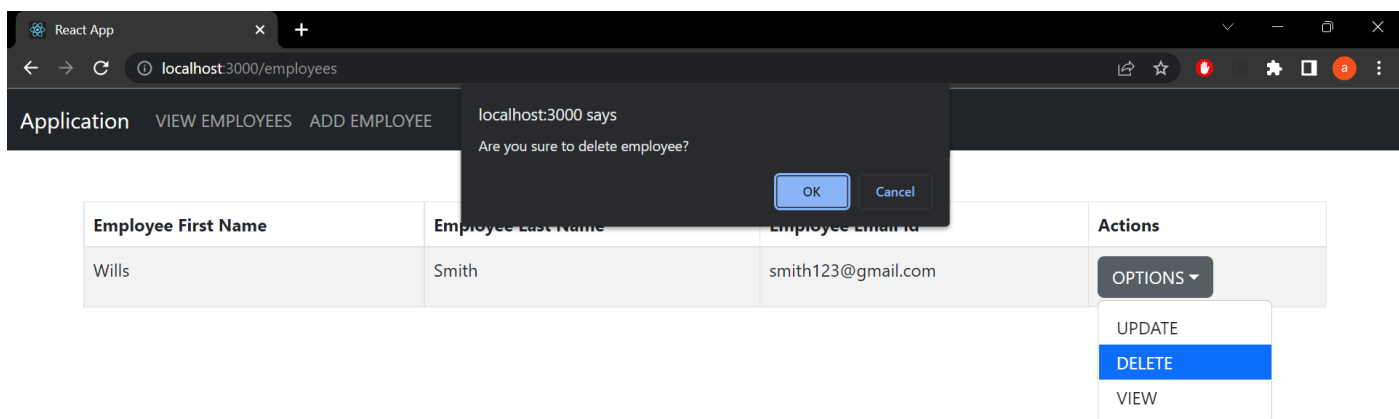
First Name:

Last Name:

Email Id:



Employee First Name	Employee Last Name	Employee Email Id	Actions
Wills	Smith	smith123@gmail.com	OPTIONS ▾



View Employee Details

Employee First Name:Wills
Employee Last Name: Smith
Employee Email ID:smith123@gmail.com

Developing Spring Boot Backend Application;

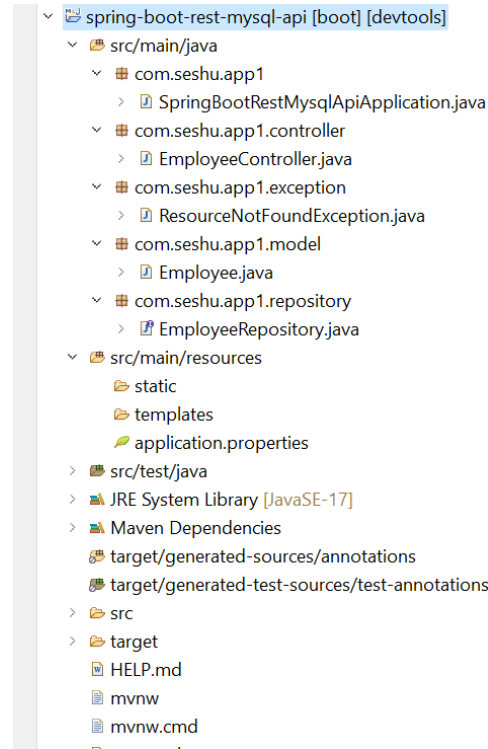
Create backend application with following dependencies;

Spring-data-jpa

Spring-web

Devtools

Mysql connector



```

<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
  http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>2.7.4</version>
    <relativePath/> <!-- lookup parent from repository -->
  </parent>
  <groupId>com.seshu</groupId>
  <artifactId>spring-boot-rest-mysql-api</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <name>spring-boot-rest-mysql-api</name>
  <description>Demo project for Spring Boot</description>
  <properties>
    <java.version>17</java.version>
  </properties>
  <dependencies>
    <dependency>
      <groupId>org.springframework.boot</groupId>
  
```

```

        <artifactId>spring-boot-starter-data-jpa</artifactId>
    </dependency>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-web</artifactId>
    </dependency>

    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-devtools</artifactId>
        <scope>runtime</scope>
        <optional>true</optional>
    </dependency>
    <dependency>
        <groupId>mysql</groupId>
        <artifactId>mysql-connector-java</artifactId>
        <scope>runtime</scope>
    </dependency>
    <dependency>
        <groupId>org.projectlombok</groupId>
        <artifactId>lombok</artifactId>
        <optional>true</optional>
    </dependency>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-test</artifactId>
        <scope>test</scope>
    </dependency>
</dependencies>

<build>
    <plugins>
        <plugin>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-maven-plugin</artifactId>
            <configuration>
                <excludes>
                    <exclude>
                        <groupId>org.projectlombok</groupId>
                        <artifactId>lombok</artifactId>
                    </exclude>
                </excludes>
            </configuration>
        </plugin>
    </plugins>
</build>

</project>

```

application.properties

```
server.port=8181

spring.datasource.url=jdbc:mysql://localhost:3306/adidb
spring.datasource.username=root
spring.datasource.password=seshu

spring.jpa.hibernate.ddl-auto=update
spring.jpa.show-sql=true
spring.jpa.database-platform=org.hibernate.dialect.MySQL8Dialect
```

Employee.java

```
package com.seshu.appl.model;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.Id;
import javax.persistence.Table;

@Entity
@Table(name = "employees")
public class Employee {

    @Id
    @GeneratedValue
    private long id;

    @Column(name = "first_name")
    private String firstName;

    @Column(name = "last_name")
    private String lastName;

    @Column(name = "email_id")
    private String emailId;

    public Employee() {

    }

    public Employee(String firstName, String lastName, String emailId)
    {
        super();
        this.firstName = firstName;
        this.lastName = lastName;
        this.emailId = emailId;
    }

    public long getId() {
        return id;
    }

    public void setId(long id) {
        this.id = id;
    }

    public String getFirstName() {
        return firstName;
    }

    public void setFirstName(String firstName) {
        this.firstName = firstName;
    }

    public String getLastName() {
        return lastName;
    }
}
```

```

    public void setLastName(String lastName) {
        this.lastName = lastName;
    }
    public String getEmailId() {
        return emailId;
    }
    public void setEmailId(String emailId) {
        this.emailId = emailId;
    }
}

```

EmployeeRepository.java

```

package com.seshu.appl.repository;

import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;

import com.seshu.appl.model.Employee;

@Repository
public interface EmployeeRepository extends JpaRepository<Employee,
Long>{

}

```

ResourceNotFoundException.java

```

package com.seshu.appl.exception;

import org.springframework.http.HttpStatus;
import org.springframework.web.bind.annotation.ResponseStatus;

@ResponseStatus(value = HttpStatus.NOT_FOUND)
public class ResourceNotFoundException extends RuntimeException{

    private static final long serialVersionUID = 1L;

    public ResourceNotFoundException(String message) {
        super(message);
    }

}

```


EmployeeController.java

```

package com.seshu.appl.controller;

import java.util.HashMap;
import java.util.List;
import java.util.Map;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.CrossOrigin;
import org.springframework.web.bind.annotation.DeleteMapping;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.PutMapping;
import org.springframework.web.bind.annotation.RequestBody;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

import com.seshu.appl.exception.ResourceNotFoundException;
import com.seshu.appl.model.Employee;
import com.seshu.appl.repository.EmployeeRepository;

@CrossOrigin(origins = "http://localhost:3000")
@RestController
@RequestMapping("/api/v1/")
public class EmployeeController {

    @Autowired
    private EmployeeRepository employeeRepository;

    @GetMapping("/employees")
    public List<Employee> getAllEmployees() {
        return employeeRepository.findAll();
    }

    @PostMapping("/employees")
    public Employee createEmployee(@RequestBody Employee employee) {
        return employeeRepository.save(employee);
    }

    @GetMapping("/employees/{id}")
    public ResponseEntity<Employee> getEmployeeById(@PathVariable Long
id) {
        Employee employee = employeeRepository.findById(id)
            .orElseThrow(() -> new
ResourceNotFoundException("Employee not exist with id :" + id));
        return ResponseEntity.ok(employee);
    }

    @PutMapping("/employees/{id}")

```

```

    public ResponseEntity<Employee> updateEmployee(@PathVariable Long
id, @RequestBody Employee employeeDetails){
        Employee employee = employeeRepository.findById(id)
            .orElseThrow(() -> new
ResourceNotFoundException("Employee not exist with id :" + id));

        employee.setFirstName(employeeDetails.getFirstName());
        employee.setLastName(employeeDetails.getLastName());
        employee.setEmailId(employeeDetails.getEmailId());

        Employee updatedEmployee = employeeRepository.save(employee);
        return ResponseEntity.ok(updatedEmployee);
    }

    @DeleteMapping("/employees/{id}")
    public ResponseEntity<Map<String, Boolean>>
deleteEmployee(@PathVariable Long id){
        Employee employee = employeeRepository.findById(id)
            .orElseThrow(() -> new
ResourceNotFoundException("Employee not exist with id :" + id));

        employeeRepository.delete(employee);

        Map<String, Boolean> response = new HashMap<>();
        response.put("deleted", Boolean.TRUE);

        return ResponseEntity.ok(response);
    }
}

```

```

package com.seshu.appl;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication
public class SpringBootRestMysqlApiApplication {

    public static void main(String[] args) {

        SpringApplication.run(SpringBootRestMysqlApiApplication.class,
args);
    }
}

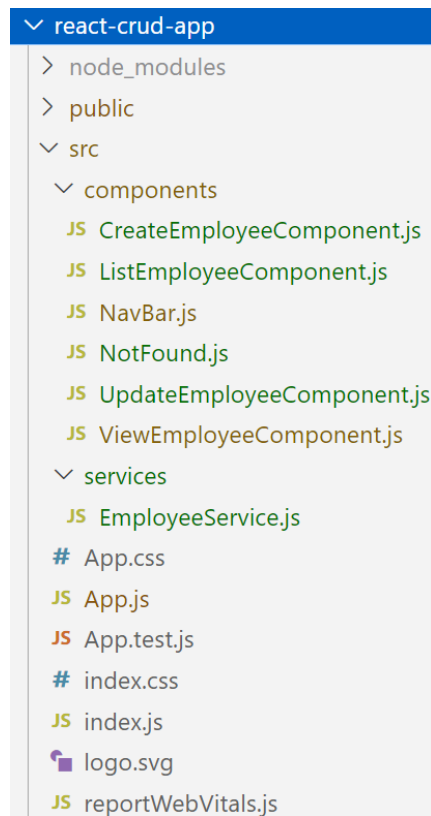
```

```
Overview Dependencies Dependency Hierarchy Effective POM pom.xml
Problems Javadoc Declaration Console x
spring-boot-rest-mysql-api - SpringBootRestMysqlApiApplication [Spring Boot App] C:\sts-4.14.1.RELEASE\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.j...
23:01:28.681 [Thread-0] DEBUG org.springframework.boot.devtools.restart.classloader.RestartClassI...

:: Spring Boot ::
               _ _ 
      / _   _ | | | |
     / ___ \_| |_|_|_|_\|_|
    /___ \__|_|_|_|_|_|_|_|
   =====|_|=====|_|_/=/_/
           (v2.7.4)

2022-10-15 23:01:30.288 INFO 20224 --- [ restartedMain] c.s.a.SpringBootRestMysqlApiApplication
2022-10-15 23:01:30.291 INFO 20224 --- [ restartedMain] c.s.a.SpringBootRestMysqlApiApplication
2022-10-15 23:01:30.500 INFO 20224 --- [ restartedMain] .e.DevToolsPropertyDefaultsPostProcesso
2022-10-15 23:01:30.500 INFO 20224 --- [ restartedMain] .e.DevToolsPropertyDefaultsPostProcesso
2022-10-15 23:01:32.971 INFO 20224 --- [ restartedMain] .s.d.r.c.RepositoryConfigurationDelegat
2022-10-15 23:01:33.311 INFO 20224 --- [ restartedMain] .s.d.r.c.RepositoryConfigurationDelegat
```

Developing Front-end application (React Application)



Steps:

Generate react application

```
>npx create-react-app react-crud-app
```

Install axios and react-router-dom

```
react-crud-app>npm install axios
```

```
react-crud-app >npm install react-router-dom
```

<https://reactrouter.com/en/v6.3.0/getting-started/overview>

Add bootstrap cdn links

react-crud-app\public\index.html

```

<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8" />
    <link rel="icon" href="%PUBLIC_URL%/favicon.ico" />
    <meta name="viewport" content="width=device-width, initial-scale=1" />
    <meta name="theme-color" content="#000000" />
    <meta
      name="description"
      content="Web site created using create-react-app"
    />
    <link rel="apple-touch-icon" href="%PUBLIC_URL%/logo192.png" />
    <!--
      manifest.json provides metadata used when your web app is installed on a
      user's mobile device or desktop. See
https://developers.google.com/web/fundamentals/web-app-manifest/
    -->
    <link rel="manifest" href="%PUBLIC_URL%/manifest.json" />
    <title>React App</title>
    <link
      href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.1/dist/css/bootstrap.min.css"
      rel="stylesheet"
      integrity="sha384-
iYQeCzEYFbKjA/T2uDLTpkwGzCiq6soy8tYaI1GyVh/UjpbCx/TYkiZhlZB6+fzT"
      crossorigin="anonymous"
    />
  </head>
  <body>
    <noscript>You need to enable JavaScript to run this app.</noscript>
    <div id="root"></div>

    <script
      src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.1/dist/js/bootstrap.bundle.min.js"
      integrity="sha384-
u10knCvxWvY5kfmNBILK2hRnQC3Pr17a+RTT6rIHI7NnikvbZlHgTP00mMi466C8"
      crossorigin="anonymous"
    ></script>
  </body>
</html>

```

Create EmployeeService

react-crud-app\src\services\EmployeeService.js

```
import axios from "axios";

const EMPLOYEE_API_BASE_URL = "http://localhost:8181/api/v1/employees";

class EmployeeService {
  getEmployees() {
    return axios.get(EMPLOYEE_API_BASE_URL);
  }

  createEmployee(employee) {
    return axios.post(EMPLOYEE_API_BASE_URL, employee);
  }

  getEmployeeById(employeeId) {
    return axios.get(EMPLOYEE_API_BASE_URL + "/" + employeeId);
  }

  updateEmployee(employee, employeeId) {
    return axios.put(EMPLOYEE_API_BASE_URL + "/" + employeeId, employee);
  }

  deleteEmployee(employeeId) {
    return axios.delete(EMPLOYEE_API_BASE_URL + "/" + employeeId);
  }
}

export default new EmployeeService();
```

Developing ListEmployeeComponent;

react-crud-app\src\components>ListEmployeeComponent.js

```

import React, { useState, useEffect } from "react";
import EmployeeService from "../services/EmployeeService";
import { Link } from "react-router-dom";

const ListEmployeeComponent = () => {
  const [employees, setEmployees] = useState([]);

  useEffect(() => {
    EmployeeService.getEmployees().then((res) => {
      setEmployees(res.data);
    });
  }, []);

  const deleteEmployee = (id) => {
    if (window.confirm("Are you sure to delete employee?")) {
      EmployeeService.deleteEmployee(id).then((res) => {
        setEmployees(employees.filter((employee) => employee.id !== id));
      });
    } else {
      return;
    }
  };

  return (
    <div className="container">
      <h2 className="text-center">Employees List</h2>
      <div className="row">
        <table className="table table-striped table-bordered">
          <thead>
            <tr>
              <th>Employee First Name</th>
              <th>Employee Last Name</th>
              <th>Employee Email Id</th>
              <th>Actions</th>
            </tr>
          </thead>
          <tbody>
            {employees.map((employee) => (
              <tr key={employee.id}>
                <td>{employee.firstName}</td>
                <td>{employee.lastName}</td>
                <td>{employee.emailId}</td>
                <td>
                  <div className="dropdown">
                    <button
                      className="btn btn-secondary dropdown-toggle"
                      type="button"

```

```

        data-bs-toggle="dropdown"
        aria-expanded="false"
      >
        OPTIONS
      </button>
      <ul className="dropdown-menu">
        <li>
          <Link
            className="btn btn-primary dropdown-item"
            to={` /update-employee/${employee.id}`}
          >
            UPDATE
          </Link>
        </li>
        <li>
          <button
            onClick={() => deleteEmployee(employee.id)}
            className="btn btn-danger dropdown-item"
          >
            DELETE
          </button>
        </li>
        <li>
          <Link
            className="btn btn-success dropdown-item"
            to={` /view-employee/${employee.id}`}
          >
            VIEW
          </Link>
        </li>
      </ul>
    </div>
  </td>
</tr>
)))}
{employees.length === 0 && (
  <tr>
    <td colSpan="4">No data found</td>
  </tr>
)}
</tbody>
</table>
</div>
</div>
);
};

export default ListEmployeeComponent;

```


Develop CreateEmployeeComponent;**react-crud-app\src\components\CreateEmployeeComponent.js**

```

import React, { useState } from "react";
import { useNavigate } from "react-router-dom";
import EmployeeService from "../services/EmployeeService";

const CreateEmployeeComponent = (props) => {
  const navigate = useNavigate();
  const initialData = {
    firstName: "",
    lastName: "",
    emailId: "",
  };
  const [employee, setEmployee] = useState(initialData);
  const { firstName, lastName, emailId } = employee;

  const handleInputChange = (e) => {
    setEmployee({ ...employee, [e.target.name]: e.target.value });
  };

  const saveEmployee = (e) => {
    e.preventDefault();
    EmployeeService.createEmployee(employee).then((res) => {
      navigate("/employees");
    });
  };

  return (
    <div className="container col-4">
      <h3>ADD EMPLOYEE DETAILS</h3>
      <div>
        <form>
          <div className="mb-3">
            <label className="form-label"> First Name: </label>
            <input
              name="firstName"
              className="form-control"
              value={firstName}
              onChange={(e) => handleInputChange(e)}
            />
          </div>
          <div className="mb-3">
            <label className="form-label"> Last Name: </label>
            <input
              name="lastName"
              className="form-control"
              value={lastName}
              onChange={(e) => handleInputChange(e)}
            />
          </div>
        </form>
      </div>
    </div>
  );
};

```

```

    </div>
    <div className="mb-3">
      <label className="form-label"> Email Id: </label>
      <input
        name="emailId"
        className="form-control"
        value={emailId}
        onChange={(e) => handleInputChange(e)}
      />
    </div>

    <button className="btn btn-primary" onClick={(e) => saveEmployee(e)}>
      ADD
    </button>
  </form>
</div>
</div>
);
};

export default CreateEmployeeComponent;

```

Develop ViewEmployeeComponent;

react-crud-app\src\components\ViewEmployeeComponent.js

```

import React, { useState, useEffect } from "react";
import { useParams } from "react-router-dom";
import EmployeeService from "../services/EmployeeService";

const ViewEmployeeComponent = () => {
  const initialData = {
    firstName: "",
    lastName: "",
    emailId: "",
  };

  const [employee, setEmployee] = useState(initialData);

  const params = useParams();

  useEffect(() => {
    EmployeeService.getEmployeeById(params.id).then((res) => {
      setEmployee(res.data);
    });
  }, []);

  return (
    <div>
      <br></br>

```

```
<div className="card col-md-6 offset-md-3">
  <h3 className="text-center"> View Employee Details</h3>
  <div className="card-body">
    <div className="row">
      Employee First Name:
      {employee.firstName}
    </div>
    <div className="row">Employee Last Name: {employee.lastName}</div>
    <div className="row">
      Employee Email ID:
      {employee.emailId}
    </div>
  </div>
</div>
</div>
);
};

export default ViewEmployeeComponent;
```

Develop UpdateEmployeeComponent;**react-crud-app\src\components\UpdateEmployeeComponent.js**

```

import React, { useState, useEffect } from "react";
import { useNavigate, useParams } from "react-router-dom";
import EmployeeService from "../services/EmployeeService";

const UpdateEmployeeComponent = () => {
  const params = useParams();
  const navigate = useNavigate();

  const initialData = {
    firstName: "",
    lastName: "",
    emailId: "",
  };

  const [employee, setEmployee] = useState(initialData);

  const { firstName, lastName, emailId } = employee;

  const onChange = (e) => {
    setEmployee({ ...employee, [e.target.name]: e.target.value });
  };

  useEffect(() => {
    EmployeeService.getEmployeeById(params.id).then((res) => {
      setEmployee(res.data);
    });
  }, []);

  const onSubmit = (e) => {
    e.preventDefault();
    EmployeeService.updateEmployee(employee, params.id).then((res) => {
      navigate("/employees");
    });
  };

  const cancel = () => {
    navigate("/employees");
  };

  return (
    <div className="container col-4">
      <h3>UPDATE EMPLOYEE</h3>
      <form>
        <div className="mb-3">
          <label className="form-label"> First Name: </label>
          <input
            placeholder="First Name"

```

```
        name="firstName"
        className="form-control"
        value={firstName}
        onChange={(e) => onInputChange(e)}
      />
    </div>
    <div className="mb-3">
      <label className="form-label"> Last Name: </label>
      <input
        placeholder="Last Name"
        name="lastName"
        className="form-control"
        value={lastName}
        onChange={(e) => onInputChange(e)}
      />
    </div>
    <div className="mb-3">
      <label className="form-label"> Email Id: </label>
      <input
        placeholder="Email Address"
        name="emailId"
        className="form-control"
        value={emailId}
        onChange={(e) => onInputChange(e)}
      />
    </div>

    <button className="btn btn-success" onClick={(e) => onSubmit(e)}>
      Update
    </button>
    <button
      className="btn btn-danger"
      onClick={() => cancel()}
      style={{ marginLeft: "10px" }}
    >
      Cancel
    </button>
  </form>
</div>
);
};

export default UpdateEmployeeComponent;
```

Develop NavBar;

react-crud-app\src\components\NavBar.js

```

import { Outlet, Link } from "react-router-dom";

const NavBar = () => {
  return (
    <>
      <nav className="navbar navbar-expand-lg navbar-dark bg-dark">
        <div className="container-fluid">
          <a className="navbar-brand" href="#">
            Application
          </a>
          <button
            className="navbar-toggler"
            type="button"
            data-bs-toggle="collapse"
            data-bs-target="#navbarSupportedContent"
            aria-controls="navbarSupportedContent"
            aria-expanded="false"
            aria-label="Toggle navigation"
          >
            <span className="navbar-toggler-icon"></span>
          </button>
          <div className="collapse navbar-collapse" id="navbarSupportedContent">
            <ul className="navbar-nav me-auto mb-2 mb-lg-0">
              <li className="nav-item">
                <Link to="/employees" className="nav-link">
                  VIEW EMPLOYEES
                </Link>
              </li>
              <li className="nav-item">
                <Link to="/add-employee" className="nav-link">
                  ADD EMPLOYEE
                </Link>
              </li>
            </ul>
          </div>
        </div>
      </nav>

      <Outlet />
    </>
  );
};

export default NavBar;

```

NotFound Component;**react-crud-app\src\components\NotFound.js**

```
const NotFound = () => {  
  return (  
    <>  
      <h2>Page Not Found</h2>  
    </>  
  );  
};  
  
export default NotFound;
```

react-crud-app\src\App.js

```
import React from "react";  
import "./App.css";  
import { BrowserRouter, Routes, Route } from "react-router-dom";  
import ListEmployeeComponent from "../components/ListEmployeeComponent";  
import CreateEmployeeComponent from "../components/CreateEmployeeComponent";  
import UpdateEmployeeComponent from "../components/UpdateEmployeeComponent";  
import ViewEmployeeComponent from "../components/ViewEmployeeComponent";  
import NavBar from "../components/NavBar";  
import NotFound from "../components/NotFound";  
  
function App() {  
  return (  
    <BrowserRouter>  
      <Routes>  
        <Route path="/" element={<NavBar />} />  
        <Route path="employees" element={<ListEmployeeComponent />} />  
        <Route path="add-employee" element={<CreateEmployeeComponent />} />  
        <Route path="view-employee/:id" element={<ViewEmployeeComponent />} />  
        <Route  
          path="update-employee/:id"  
          element={<UpdateEmployeeComponent />}  
        />  
        <Route path="*" element={<NotFound />} />  
      </Routes>  
    </BrowserRouter>  
  );  
}  
  
export default App;
```

react-crud-app\src\index.js

```
import React from "react";
```

```
import ReactDOM from "react-dom";
import "./index.css";
import App from "./App";
import reportWebVitals from "./reportWebVitals";

ReactDOM.render(
  <React.StrictMode>
    <App />
  </React.StrictMode>,
  document.getElementById("root")
);

// If you want to start measuring performance in your app, pass a function
// to log results (for example: reportWebVitals(console.log))
// or send to an analytics endpoint. Learn more: https://bit.ly/CRA-vitals
reportWebVitals();
```

Run the react application;

react-crud-app>npm start