Full Stack Application with Spring Boot and React JS

Spring Initializer

https://start.spring.io/

Select Below Details:
Project: Maven
Language: Java
Spring Boot: 3.0.2(Latest)
Artifact: File Name
Packaging: Jar
Java: 11(Select as per laptop java version: cmd -> java -- version)

Add Dependencies: Spring Web
                      Spring Data JPA
                      MySQL Driver
                      Spring Boot Devtools

Click on GENERATE button to generate zip file.

Extract Zip file in location and open in Eclipse

Eclipse -> File -> Import -> Existing Maven Project -> Browse -> Select Folder -> Finish

---

Create Packages under main package

model: All the entity, getter, setter, constructor
repository: jpa implementation
controller: mapping all the http requests (Get, Post, Put, Delete)
exception: exception handling

```
fullstack-backend
  src/main/java
    com.codewitharjun.fullstackbackend
      FullstackBackendApplication.java
    com.codewitharjun.fullstackbackend.controller
      UserController.java
    com.codewitharjun.fullstackbackend.exception
      UserNotFoundAdvice.java
      UserNotFoundException.java
    com.codewitharjun.fullstackbackend.model
      User.java
    com.codewitharjun.fullstackbackend.repository
      UserRepository.java
```

model – User.java

```java
@Entity
public class User {
@Id
@GeneratedValue
private Long id;
private String username;
private String name;
private String email;
```

Press ctrl+shift+O to organize imports

Generate getter and setter for all

Select integers -> right click -> Source -> Generate Getters and Setters -> Select All -> Generate

---

repository – UserRepository Interface

```java
public interface UserRepository extends JpaRepository <User, Long>{

}
```

Where : User = name of model class
        Long = datatype of primary key (id)

---

resources/application.properties

```
#configuration
spring.jpa.hibernate.ddl-auto=update
spring.datasource.url=jdbc:mysql://localhost:3306/fullstack2
spring.datasource.username=root
spring.datasource.password=12345
spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver
```

controller – UserController.java

```java
@RestController
@CrossOrigin("http://localhost:3000")
public class UserController {

@Autowired
private UserRepository userRepository;

@PostMapping("/user")
User newUser(@RequestBody User newUser) {
return userRepository.save(newUser);
}

@GetMapping("/users")
List<User> getAllUsers(){
return userRepository.findAll();
}
```

Create React App

Open cmd in folder where we want to create react app

Commands:
npm create-react-app filename
npm start   : run react code (run in main react folder)
npm i bootstrap   : install bootstrap (run in main react folder)
npm i axios   : get sql data in react
npm i react-router-dom :   create pages in react
code ..   : open code in Visual Studio Code

Add Extension – React Snippets

Search React Snippets in extension
Full Name:
ES7+ React/Redux/React-Native snippets

After installing write **rfc**(react functional components) in .js file
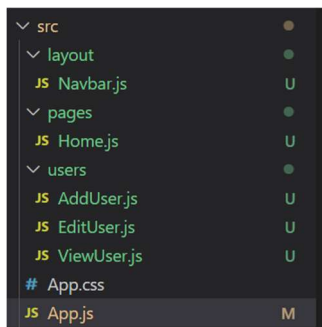rfc + enter

---

For import bootstrap

Write below line in App.js

import "../node_modules/bootstrap/dist/css/bootstrap.min.css";

To copy the path
node_modules -> search bootstrap -> dist -> css -> bootstrap.min.css (last 6th) -> right click
 -> copy relative path -> remove file name and change backward slash \ to forward slash /

Create JS files in src folder

Navbar.js

Search Navbar in bootstarp and copy the code

Change class to className

In App.js
import Navbar from './layout/Navbar';

```
function App() {
 return (
  <div className='App'>
   <Router>
    <Navbar/>
  </div>
 );
}
```

Home.js

```javascript
import React, { useEffect, useState } from "react";
import axios from "axios";
import { Link, useParams } from "react-router-dom";

export default function Home() {
    const [users, setUsers] = useState([]);

    const loadUsers = async () => {
        const result = await axios.get("http://localhost:8080/users");
        setUsers(result.data);
    };

    useEffect(() => {
        loadUsers();
    }, []);

  return (
    <div className='container'>
        <div className='py-4'>
        <table className="table border shadow">
<thead>
  <tr>
    <th scope="col">Id</th>
    <th scope="col">Name</th>
    <th scope="col">Username</th>
    <th scope="col">Email Id</th>
    <th scope="col">Action</th>
  </tr>
</thead>
<tbody>

  {
      users.map((user, index)=> (
          <tr>
              <th scope="row" key={index}>
                  {index + 1}
              </th>
              <td>{user.name}</td>
              <td>{user.username}</td>
              <td>{user.email}</td>
              <td>
                  <button className="btn btn-primary mx-2">View</button>
                  <button className="btn btn-outline-primary mx-
2">Edit</button>
                  <button className="btn btn-danger mx-2">Delete</button>
              </td>
```

```
            </tr>
        ))
    }
  </tbody>
</table>
        </div>
    </div>
  )
}
```

Add CrossOrigin in controller.java

@CrossOrigin("http://localhost:3000")

Create pages in React

React router dom

npm i react-router-dom

Write below line in App.js
import {BrowserRouter as Router,Routes,Route} from "react-router-dom";

```
function App() {
  return (
    <div className='App'>
      <Router>
        <Navbar/>

        <Routes>
          <Route exact path="/" element={<Home/>} />
          <Route exact path="/adduser" element={<AddUser/>} />
          <Route exact path="/edituser/:id" element={<EditUser/>} />
          <Route exact path="/viewuser/:id" element={<ViewUser/>} />
        </Routes>
      </Router>
    </div>
  );
}
```

Change button to link in navbar

<Link className="btn btn-outline-light" to="/adduser">Add User</Link>

Register User form using React (AddUser.js)

```jsx
return (
    <div className="container">
      <div className='row'>
        <div className='col-md-6 offset-md-3 border rounded p4 mt-2 shadow'>
          <h2 className='text-center m-4'>Register User</h2>

          <form onSubmit={(e) => onSubmit(e)}>

          {/* ----------------- */}
            <div className='mb-3'>
              <label htmlFor='Name' className="form-label">Name</label>
              <input type={"text"} className="form-control" placeholder='Enter
your name' name='name'
              value={name}
              onChange={(e)=>onInputChange(e)}
              />
            </div>
          {/* ----------------- */}
            <div className='mb-3'>
              <label htmlFor='Username' className="form-label">Username</label>
              <input type={"text"} className="form-control" placeholder='Enter
your username' name='username'
              value={username}
              onChange={(e)=>onInputChange(e)}
              />

            </div>
          {/* ----------------- */}
            <div className='mb-3'>
              <label htmlFor='Email' className="form-label">E-mail</label>
              <input type={"text"} className="form-control" placeholder='Enter
your e-mail address' name='email'
              value={email}
              onChange={(e)=>onInputChange(e)}
              />
            </div>
            <div className='mb-3'>
            <button type="submit" className='btn btn-outline-
primary'>Submit</button>
            <Link className='btn btn-outline-danger mx-2' to="/">Cancel</Link>
          </div>
          </form>
        </div>
      </div>
    </div>
  )
```

Store User Information

import { useState } from 'react'

```
const [user, setUser] = useState({
  name: "",
  username: "",
  email: "",
});

const { name, username, email } =user;

const onInputChange = (e) => {
  setUser({ ...user, [e.target.name]: e.target.value });
};
```
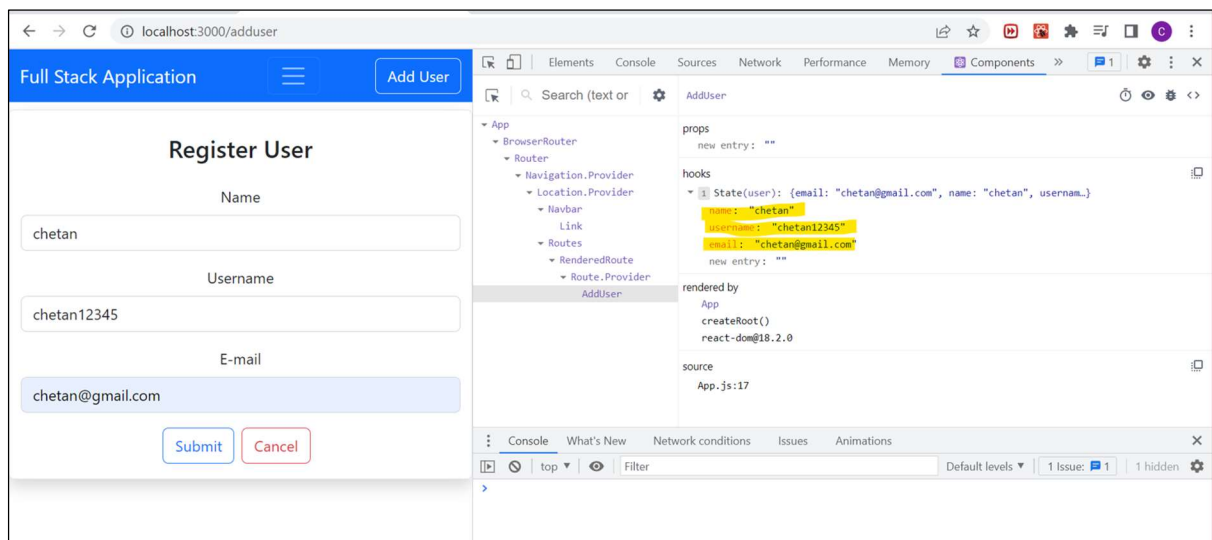
Add React Developer Tools Extension on Crome

After write value in textbox

Right click -> Inspect -> Elements -> **>>** -> components -> addUser

AXIOS data Post

import axios from 'axios';
import {Link , useNavigate } from 'react-router-dom';

```
let navigate=useNavigate()

  const onSubmit = async (e) => {
    e.preventDefault();
    await axios.post("http://localhost:8080/user",user)
    navigate("/")
  };
```

Find user by id

controller/UserController.java

```java
@GetMapping("/user/{id}")
User getUserById(@PathVariable Long id) {
return userRepository.findById(id)
.orElseThrow(() -> new UserNotFoundException(id));
}
```

exception/UserNotFoundException.java

```java
public class UserNotFoundException extends RuntimeException{
public UserNotFoundException(Long id) {
super("could not found the user with id "+ id);
}
}
```

exception/UserNotFoundAdvice.java

```java
@ControllerAdvice
public class UserNotFoundAdvice {
@ResponseBody
@ExceptionHandler(UserNotFoundException.class)
@ResponseStatus(HttpStatus.NOT_FOUND)
public Map<String,String> exceptionHandler(UserNotFoundException
exception){
Map<String,String> errorMap=new HashMap<>();
errorMap.put("errorMessage",exception.getMessage());
return errorMap;
}
}
```

Update user

controller/UserController.java

```java
@PutMapping("/user/{id}")
User updateUser(@RequestBody User newUser,@PathVariable Long id) {
return userRepository.findById(id)
.map(user -> {
user.setUsername(newUser.getUsername());
user.setName(newUser.getName());
user.setEmail(newUser.getEmail());
return userRepository.save(user);
}).orElseThrow(() -> new UserNotFoundException(id));
}
```

Delete User

controller/UserController.java

```java
@DeleteMapping("/user/{id}")
String deleteUser(@PathVariable Long id) {
if(!userRepository.existsById(id)) {
throw new UserNotFoundException(id);
}
userRepository.deleteById(id);
return "User with id "+id+" has been deleted successfully.";
}
```

Edit User React Page

Copy code from AddUser.js

Change EditUser word:

export default function ==EditUser==() {
<h2 className='text-center m-4'>==Edit User==</h2>

In Home.js change button to Link
<Link className="btn btn-outline-primary mx-2" to={`/edituser/${user.id}`}>Edit</Link>

In App.js

import EditUser from './users/EditUser';
<Route exact path="/edituser/:id" element={<EditUser/>} />

(Similar for ViewUser.js also in next steps)

In EditUser.js

Change .post method to .put method

```
export default function EditUser() {
  const [user, setUser] = useState({
    name: "",
    username: "",
    email: "",
  });

  const { name, username, email } =user;

  const onInputChange = (e) => {
    setUser({ ...user, [e.target.name]: e.target.value });
  };

  let navigate=useNavigate()

const {id}=useParams()

const onSubmit = async (e) => {
    e.preventDefault();
```

```
    await axios.put(`http://localhost:8080/user/${id}` , user);
    navigate("/");
};


useEffect(() => {
    loadUser();
}, []);

const loadUser = async () => {
    const result = await axios.get(`http://localhost:8080/user/${id}`);
    setUser(result.data);
};
```

Delete User in React

In Home.js add below code

```
const { id }=useParams();

    const deleteUser = async (id)=> {
      await axios.delete(`http://localhost:8080/user/${id}`);
      loadUsers();
    };
```

Delete User Button:

```
<button className="btn btn-danger mx-2" onClick={() =>
deleteUser(user.id)}>Delete</button>
```

View User In React

ViewUser.js

```jsx
  return (
    <div className="container">
      <div className='row'>
        <div className='col-md-6 offset-md-3 border rounded p4 mt-2 shadow'>
          <h2 className='text-center m-4'>User Details</h2>

          <div className='card'>
            <div className='card-header'>
              Details of user id: {user.id}
              <ul className="list-group list-group-flush">

                {/* ----------------- */}
                <li className='list-group-item'>
                  <b>Name: </b>
                  {user.name}
                </li>

                {/* ----------------- */}
                <li className='list-group-item'>
                  <b>Username: </b>
                  {user.username}
                </li>

                {/* ----------------- */}
                <li className='list-group-item'>
                  <b>Email: </b>
                  {user.email}
                </li>
              </ul>
            </div>
          </div>
          <Link className='btn btn-primary mx-2 my-4' to="/">Back to
Home</Link>
        </div>
      </div>
    </div>
  )
```

```jsx
import axios from 'axios';
import React, {useEffect, useState } from 'react'
import {Link, useParams} from "react-router-dom";
```

```
export default function ViewUser() {

  const [user, setUser] = useState({
      name: "",
      username: "",
      email: "",
  });

  const { id } = useParams();

  useEffect(() => {
    loadUser();
  }, []);

  const loadUser = async () => {
    const result = await axios.get(`http://localhost:8080/user/${id}`);
    setUser(result.data);
  };
```

Change in Navbar Link

<Link className="navbar-brand" to="/">Full Stack Application</Link>

Shortcut Keys:

Ctrl + Shift + O   : Organize Imports
Ctrl + Shift + F   : Format Text
Ctrl + ALT + up/down   : Duplicate Text
ALT + up/down   : Move Text