Practical: 10

Aim: Working with forms in React.

Hardware Requirement:

1. **Operating System:** Microsoft Windows 10 pro
2. **Processor:** 11th Gen Intel Core i5-1135G7 @2.40GHz, 2419 MHz, 4Core
3. **RAM:** 8GB DDR4
4. **Storage:** 256GB SSD 1TB HDD

Software Requirement:

1. **Download Link:** https://nodejs.org/en/download
2. **React.js:** React is a JavaScript library for building user interfaces. You'll need to set up a React project.
3. **Form Components:** Create React components to represent different parts of your form, such as input fields, buttons, and error messages.
4. **State Management:** Utilize React state to manage form data and validation state.
5. **Validation Library or Custom Validation Logic:** Choose a validation library like Formik or Yup, or implement custom validation logic to ensure data integrity.
6. **Styling:** Optionally, you may want to include CSS or a UI framework like Bootstrap for styling your form components.

Knowledge Requirement:

1. **React.js Fundamentals:** Understanding of React components, props, state, and lifecycle methods.
2. **HTML Forms:** Familiarity with HTML form elements and attributes like <input>, <select>, <textarea>, and form submission.
3. **JavaScript (ES6+):** Knowledge of modern JavaScript concepts such as arrow functions, destructuring, and object literals.
4. **Form Validation Techniques:** Understanding of form validation techniques including client-side and server-side validation.

5. **React Hooks (optional):** If using functional components, knowledge of React hooks like useState and useEffect can be helpful.

Theory:

- **Form Elements:**
  - **Username:** Allows users to input their desired username with specified length and character restrictions.
  - **Email:** Collects user email addresses with enforced email format validation.
  - **Password:** Used for account security, validated for minimum length and password strength.
  - **Confirm Password:** Ensures accuracy by asking users to re-enter their password, matching the previous input.
- **Validation:**
  - **Password Length:** Ensure minimum length requirements are met.
  - **Password Strength:** Evaluate the presence of uppercase, lowercase letters, numbers, and special characters.
  - **Email Format:** Validate email addresses to ensure they follow the correct format.
  - **Error Messaging:** Display appropriate error messages to guide users in correcting their input before submission.

App.js

```
import React, { useState } from 'react';
import './App.css';

function FormValidation() {
  const [formData, setFormData] = useState({
    username: '',
    email: '',
    password: '',
    confirmPassword: '',
  });

  const [errors, setErrors] = useState({});
  const [submissionStatus, setSubmissionStatus] = useState(null);
  const [passwordStrength, setPasswordStrength] = useState('');

  const validateForm = () => {
    let errors = {};
```

```
    let isValid = true;

    if (!formData.username.trim()) {
      errors.username = 'Username is required';
      isValid = false;
    }

    if (!formData.email.trim()) {
      errors.email = 'Email is required';
      isValid = false;
    } else if (!/\S+@\S+\.\S+/.test(formData.email)) {
      errors.email = 'Email address is invalid';
      isValid = false;
    }

    if (!formData.password.trim()) {
      errors.password = 'Password is required';
      isValid = false;
    } else if (formData.password.length < 6) {
      errors.password = 'Password must be at least 6 characters';
      isValid = false;
    } else if (!/(?=.*[!@#$%^&*])/.test(formData.password)) {
      errors.password = 'Password must contain at least one special character';
      isValid = false;
    }

    if (formData.password !== formData.confirmPassword) {
      errors.confirmPassword = 'Passwords do not match';
      isValid = false;
    }

    setErrors(errors);
    return isValid;
  };

  const getPasswordStrength = (password) => {
    if (password.length < 6) {
      return 'Weak';
    } else if (!/(?=.*[a-z])/.test(password) || !/(?=.*[A-Z])/.test(password) ||
!/(?=.*\d)/.test(password)) {
      return 'Medium';
    } else {
      return 'Strong';
    }
  };
```

```
  const handleSubmit = (e) => {
    e.preventDefault();
    if (validateForm()) {
      console.log('Form is valid, submitting...');
      setSubmissionStatus('success');
    } else {
      console.log('Form has errors, cannot submit');
      setSubmissionStatus('error');
    }
  };

  const handleChange = (e) => {
    const { name, value } = e.target;
    if (name === 'password') {
      setPasswordStrength(getPasswordStrength(value));
    }
    setFormData({
      ...formData,
      [name]: value,
    });
  };

  return (
    <div className="background">
      <div className="form-container">
        <h1>Form Validation</h1>
        <form onSubmit={handleSubmit}>
          <div>
            <label>Username</label>
            <input
              type="text"
              name="username"
              value={formData.username}
              onChange={handleChange}
            />
            {errors.username && <span className="error-
message">{errors.username}</span>}
          </div>
          <div>
            <label>Email</label>
            <input
              type="email"
              name="email"
              value={formData.email}
```

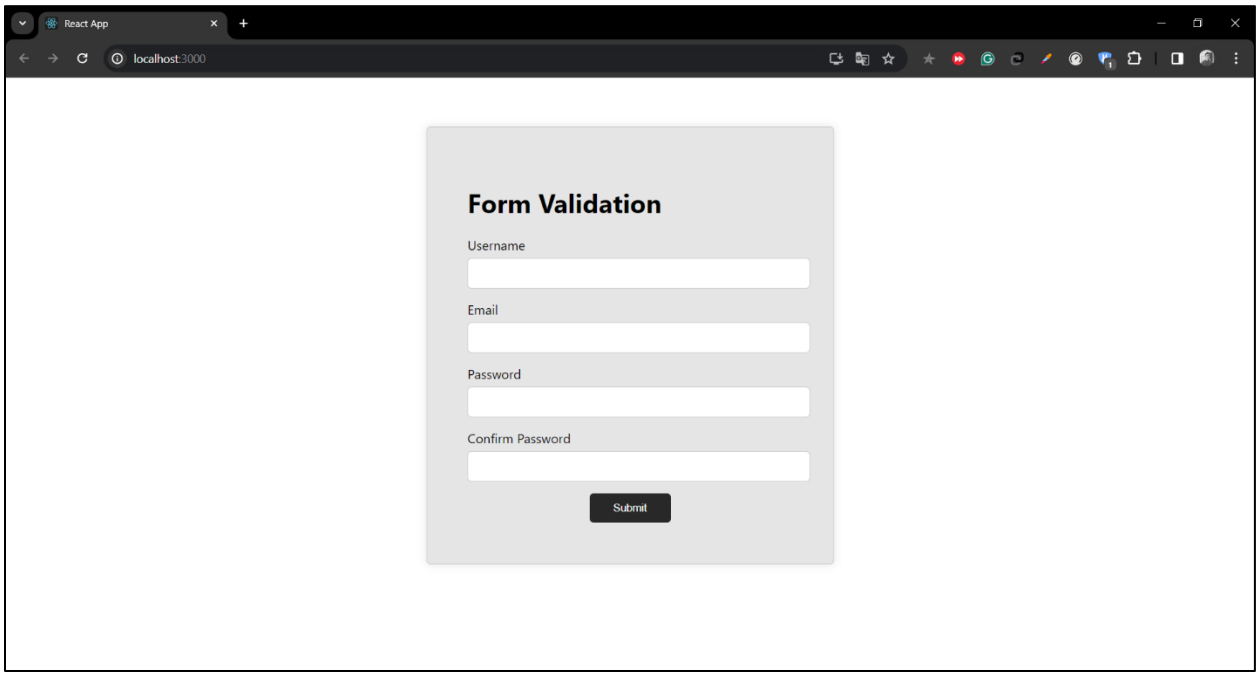
```
              onChange={handleChange}
            />
            {errors.email && <span className="error-
message">{errors.email}</span>}
          </div>
          <div>
            <label>Password</label>
            <input
              type="password"
              name="password"
              value={formData.password}
              onChange={handleChange}
            />
            {errors.password && <span className="error-
message">{errors.password}</span>}
            {passwordStrength && <p className={`password-strength
${passwordStrength.toLowerCase()}`}>Password Strength: {passwordStrength}</p>}
          </div>
          <div>
            <label>Confirm Password</label>
            <input
              type="password"
              name="confirmPassword"
              value={formData.confirmPassword}
              onChange={handleChange}
            />
            {errors.confirmPassword && <span className="error-
message">{errors.confirmPassword}</span>}
          </div>
          <button type="submit" className={`submit-button ${submissionStatus ===
'success' ? 'success-button' : submissionStatus === 'error' ? 'error-button' :
''}`}>
            Submit
          </button>

        </form>
        {submissionStatus === 'success' && <p className="success-message">Form
submitted successfully!</p>}
        {submissionStatus === 'error' && <p className="error-message">Form
submission failed. Please check the form.</p>}
      </div>
    </div>
  );
}
```

```
export default FormValidation;
```

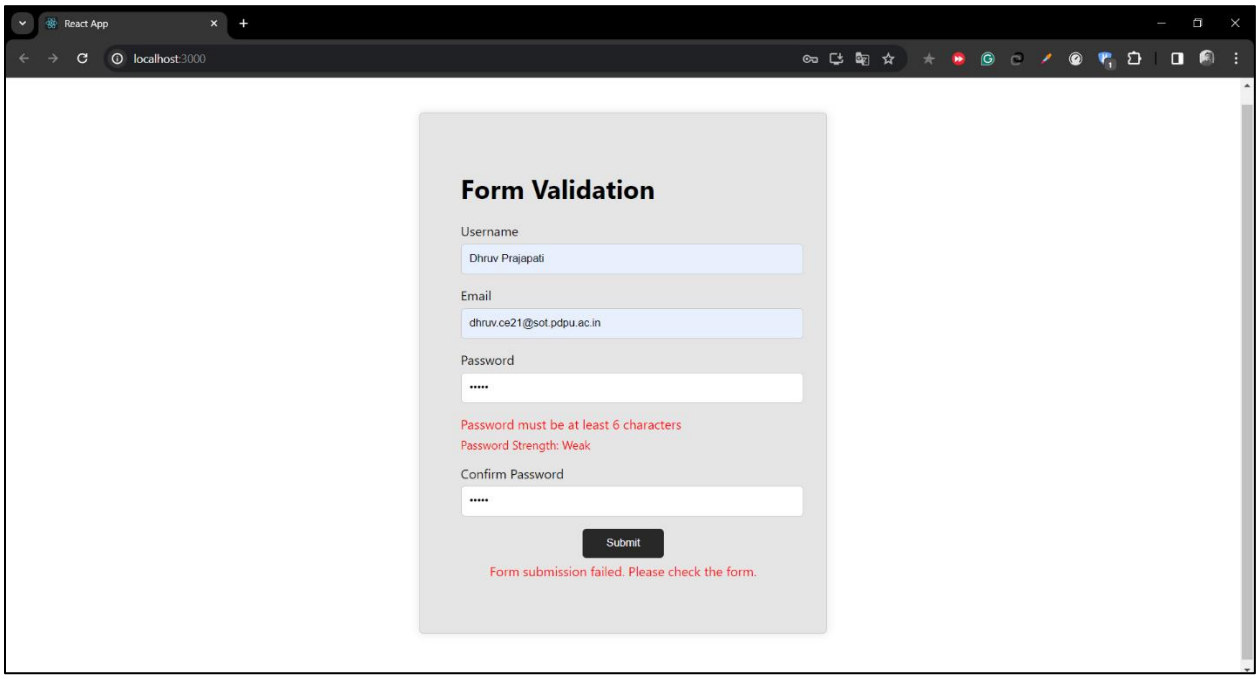
App.css

```
.form-container {
  max-width: 400px;
  margin: 60px auto;
  padding: 50px;
  border: 1px solid #ccc;
  border-radius: 5px;
  box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);
  background-color: #e5e5e5;
}

.form-container h1 {
  margin-bottom: 20px;
}

.form-container label {
  display: block;
  margin-bottom: 5px;
}

.form-container input[type="text"],
.form-container input[type="email"],
.form-container input[type="password"] {
  width: 100%;
  padding: 10px;
  margin-bottom: 15px;
  border: 1px solid #ccc;
  border-radius: 5px;
}

.form-container .submit-button {
  display: block;
  margin: 0 auto;
  width: 100px;
  padding: 10px;
  background-color: #282828;
  color: #fff;
  border: none;
  border-radius: 5px;
  cursor: pointer;
}
```

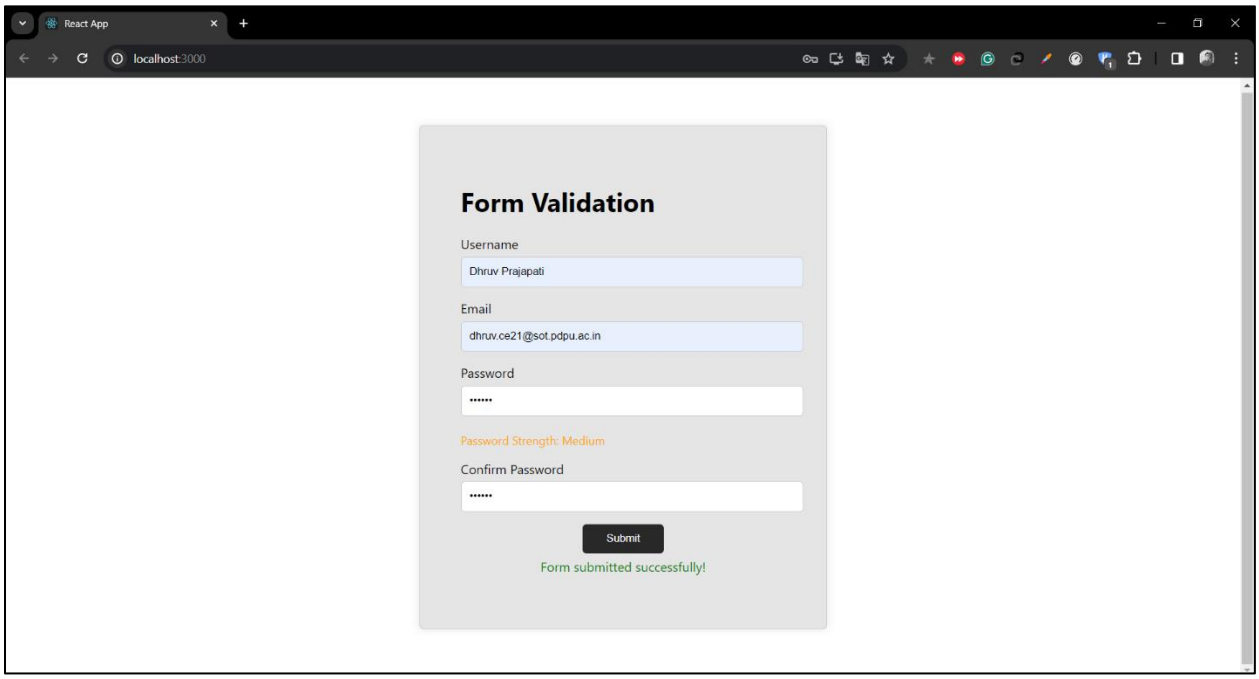
```
.form-container .submit-button:hover {
  background-color: #c0bbbb;
  color: black;
}

.error-message {
  color: red;
  margin-top: 5px;
  text-align: center;
}

.success-message {
  color: green;
  margin-top: 5px;
  text-align: center;
}

.password-strength {
  margin-top: 5px;
  font-size: 0.9em;
}

.weak {
  color: red;
}

.medium {
  color: orange;
}

.strong {
  color: green;
}

.success-button {
  background-color: green;
  color: white;
}

.error-button {
  background-color: red;
  color: white;
}
```



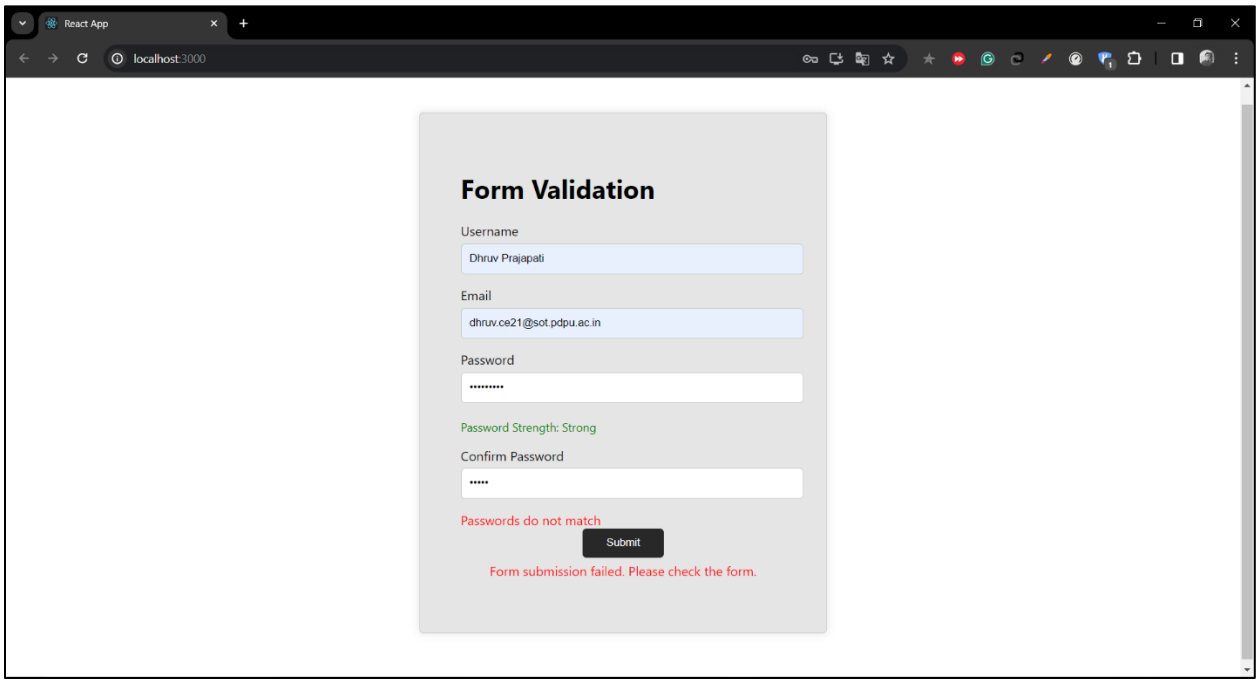
Password must be at least 6 character.



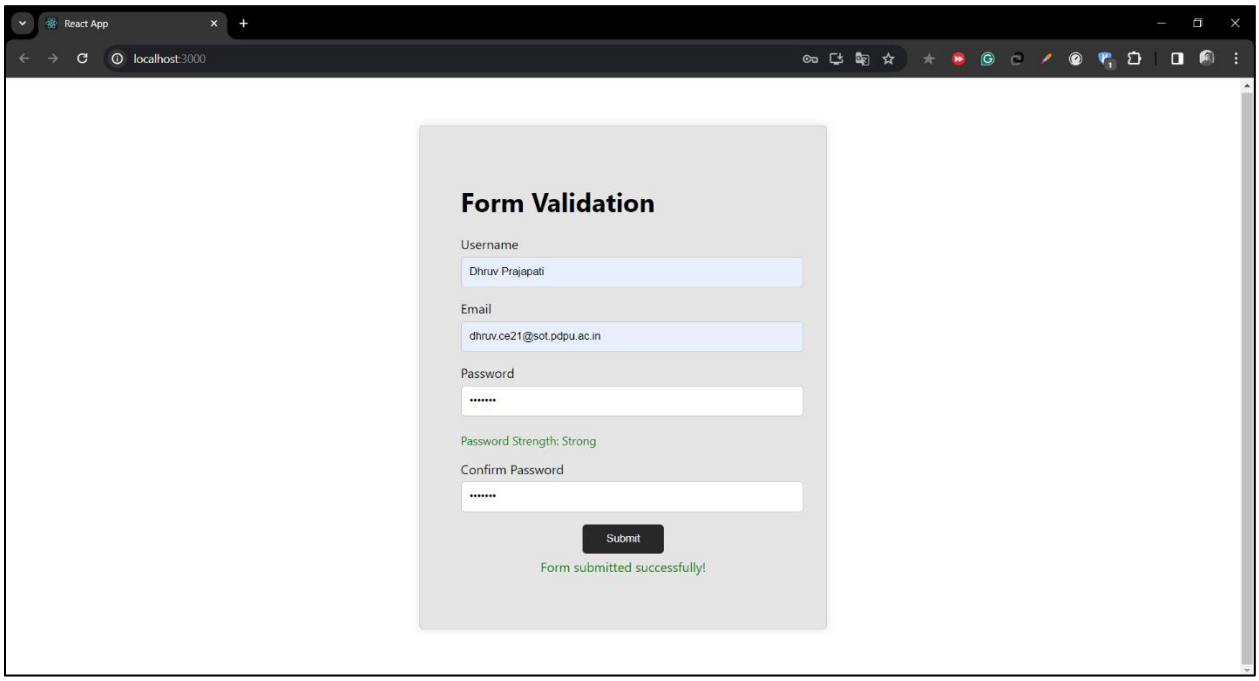
Password is correct but password strength is medium.



Password strength is strong but password did not match.



Form validation successfully.



Conclusion:

In conclusion, working with forms in React involves creating React components to represent form elements, managing their state, and implementing form validation to ensure data integrity. By leveraging React's component-based architecture and state management capabilities, developers can build interactive and user-friendly forms for collecting and validating user input. Whether using libraries like Formik and Yup or implementing custom validation logic, the goal is to create a seamless and intuitive user experience while ensuring data consistency and accuracy.

References:

https://react.dev/learn

https://www.w3schools.com/REACT/DEFAULT.ASP