1. Contents

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2. React and JSX Fundamentals

1. Create a react app using Vite:

My node version on the Ubuntu WSL was outdated so I ran this command to install the latest long term support version of it:

```
$ nvm install -lts
```

```
$ node -v
```

```
v20.14.0
```

In order to create a Vite project this command should be used and the Vite should be followed:

```
$ npm create vite
```

In order not having to install npm packages every time for each project and using the computer hard disk unnecessary und inefficient, pnpm instead will be used. Pnpm uses hard links and symlinks to save one version of a module only ever once on a disk. for installing it, this command have been used:

```
$ wget -qO- https://get.pnpm.io/install.sh | sh -
```

After that, instead of `npm install`, `pnpm install` will be used.

For running the program using pnpm, the following command should be used:

```
$ pnpm run dev
```

For running the program using npm, the following command should be used:

```
$ npm run dev
```

Project can also be run by using the Vite command:

```
$ npx vite
```


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2. If-else statement in JSX using ternary Operator

In React, component names should start with an uppercase letter

```jsx
import React from 'react';

function JSX_Conditional_Rendering_Using_Ternary_Operator() {
    let status = false
    return (
        <div>
        <h1>JSX_Conditional_Rendering_Using_Ternary_Operator:</h1>
            {status ?
            /* If it is true:*/
            <button>Logout</button>
            :
            /* If it is false:*/
            <button>Login</button>}
        </div>
    );
};

export default
JSX_Conditional_Rendering_Using_Ternary_Operator;
```


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3. Anonymous Function

```
import { useState, React } from 'react'

function App() {
  let points =75;
  return (
    <div>
      {(
        () => {
          /* Functions Body: */
          if(points>=80 && points<100){
            return <h1>A+</h1>
          }
          else if(points>=70 && points<80){
            return <h1>A-</h1>
          }
          else if(points>=60 && points<70){
            return <h1>B</h1>
          }
          else {
            return <h1>Failed</h1>
          }
        }
        /* Calling the function in this section:*/
      ) ()}
    </div>
  );
};
export default App;
```


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4. JSX For-Loop

Using map function and then calling an anonymous function inside the map-function:

- ❖ Don't forgot to add 'return' to the map function!

```
import React from "react";

function JSX_Loop() {

  const cars = ["Honda", "Ford", "Toyota"];

  return (

      <ul>

        {cars.map( (item, index) => { return (<li key={index.toString()}> {item} </li>) } ) }

      </ul>

  );

}

export default JSX_Loop;
```


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5. JSX Conditional Rendering Using IF-Else:

In this code, more efficient and cleaner way, of implementing If-Else by using functions is illustrated:

```
import React from 'react';
function loginButton(isLoggedIn) {
    if (isLoggedIn){
        return<button>Logout</button>
    }
    else{
        return<button>Login</button>
    }
}
function JSX_Conditional_Rendering_Using_If_Else(){
    return (
        <div>
            {loginButton(true)}
        </div>
    );
};
export default JSX_Conditional_Rendering_Using_If_Else;
```


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6. JSX Conditional Rendering Using Switch Statement:

```
import React from 'react';
function JSX_Conditional_Rendering_Using_switch(){
    const status = true;

    switch(status){
        case true: return <button>Log out</button>;
        case false: return <button>Log in</button>;
        default: return null;

    }

};
export default JSX_Conditional_Rendering_Using_switch;
```

7. JSX Conditional Rendering Using && Operator:

If condition is true, it will execute the code after the '&&' operator, otherwise it won't execute something else.

```
import React from 'react';

function JSX_Conditional_Rendering_Using_And_And_Operator() {
    let status = true
    return (
        <div>
        <h1>JSX_Conditional_Rendering_Using_And_And_Operator</h1>
        {status && <button>Logout</button>}
        </div>
    );
};

export default JSX_Conditional_Rendering_Using_And_And_Operator;
```


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8. Passing Properties to Child Component:

It has a unidirectional flow, so you cannot pass components from child to parent.

Passing a String

Like html we will use Attributes:

Parent Component:

```
import { useState, React } from 'react'
import JSX_Passing_Properties_String_to_This_Child_Component from
'./components/JSX_Passing_Properties_String_to_This_Child_Component';

function App() {
  return (
    <div>
      …
    <JSX_Passing_Properties_String_to_This_Child_Component
message='This is a String from parent component'/>
    </div>
  );
};
```

Child Component:

```
import React from 'react';
function JSX_Passing_Properties_String_to_This_Child_Component(props) {
    return (
        <div>
            <h3>JSX_Passing_Properties_String_to_This_Child_Component:</h3>
            <h4>message from parent component:</h4>
            <p>{props.message}</p>
        </div>
    );
};
export default JSX_Passing_Properties_String_to_This_Child_Component;
```


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Passing an Object:

Parent Component:

```
import { useState, React } from 'react'
import JSX_Passing_Properties_Object_to_This_Child_Component from
'./components/JSX_Passing_Properties_Object_to_This_Child_Component';
function App() {
  const carObject = {
    brand: "Volvo",
    countryOfOrigin: "Sweden",
    productionDate: 1927
  }
  return (
    <div>
     .. ...
    <JSX_Passing_Properties_Object_to_This_Child_Component car={carObject}/>
    </div>
  );
};
export default App;
```


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Child Component:

```jsx
import React from 'react';
function JSX_Passing_Properties_Object_to_This_Child_Component(props) {
    return (
        <div>
            <h3>JSX_Passing_Properties_Object_to_This_Child_Component</h3>
            <h4>message from parent component:</h4>
            <ul>
                <li>Name of the brand: {props.car["brand"]} </li>
                <li>Origin country of the brand: {props.car["countryOfOrigin"]} </li>
                <li>Date of origination: {props.car["productionDate"]} </li>
            </ul>
        </div>
    );
};
export default JSX_Passing_Properties_Object_to_This_Child_Component;
```


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Passing a Function:

Parent Component:

```
import { useState, React } from 'react'
import JSX_Passing_Properties_Function_to_This_Child_Component from
'./components/JSX_Passing_ Function _Object_to_This_Child_Component';

function buttonOnClick(){
  alert("You have clicked the button")
}

function App() {
  return (
    <div>
     .. ...
    <JSX_Passing_Properties_Function_to_This_Child_Component
func={buttonOnClick}/>
    </div>
  );
};
export default App;
```


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Child Component:

```jsx
import React from 'react';

function JSX_Passing_Properties_Function_to_This_Child_Component(props) {
    return (
        <div>
            <h3>JSX_Passing_Properties_Function_to_This_Child_Component</h3>
            <h4>function from parent component:</h4>
            <button onClick={props.func} >Submit</button>
        </div>
    );
};

export default JSX_Passing_Properties_Function_to_This_Child_Component;
```


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9. Managing Click Event:

Wrong Way:

If you implement a function in this way, as illustrated in the code below, the browser will constantly keep running this function whenever the user refreshes the page instead of running it only when the button is clicked.

App Component:

```
import { useState, React } from 'react'
import ButtonComponent from './components/Managing_Click_Event';

function App() {
  return (
    <div>
     .. ...
      <ButtonComponent />

    </div>
  );
};
export default App;
```

Button function in 'Managing_ Click_ Event' Component:

```
import React from "react";

function ButtonComponent(){
    <button onClick={alert('button is clicked') } > Submit </button>
}

export default ButtonComponent;
```


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Correct Way By Using Arrow Function:

Button function in 'Managing_Click_Event' Component:

```
import React from "react";

function ButtonComponent (){
    return(
    <button onClick={()=>{alert('button is clicked')} } > Submit </button>
    )
}

export default ButtonComponent;
```

Correct Way By Using Regular Function:

```
import React from "react";


function onClickFunction(){
    alert("you have clicked the button")
}

function FormComponent(){
    return(
    <div>
        <h3>Managing_Click_Events</h3>
        <h4>Button component for managing click events</h4>
        <button onClick={onClickFunction}> Submit </button>
    </div>
    )
}

export default FormComponent;
```


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10.File structure of this chapter:

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11.App.jsx of this chapter:

```jsx
import { useState, React } from 'react'


import JSX_Immediately_invoked_function from './components/JSX_Immediately_invoked_function';
import JSX_Loop from './components/JSX_Loop';
import JSX_Conditional_Rendering_Using_If_Else from './components/JSX_Conditional_Rendering_Using_If_Else';
import JSX_Conditional_Rendering_Using_switch from './components/JSX_Conditional_Rendering_Using_Switch_Statement';
import JSX_Conditional_Rendering_Using_Ternary_Operator from './components/JSX_Conditional_Rendering_Using_Ternary_Operator';
import JSX_Conditional_Rendering_Using_And_And_Operator from './components/JSX_Conditional_Rendering_Using_And_And_Operator';
import JSX_Passing_Properties_String_to_This_Child_Component from './components/JSX_Passing_Properties_String_to_This_Child_Component';
import JSX_Passing_Properties_Object_to_This_Child_Component from './components/JSX_Passing_Properties_Object_to_This_Child_Component';
import JSX_Passing_Properties_Function_to_This_Child_Component from './components/JSX_Passing_Properties_Function_to_This_Child_Component';
import ButtonComponent from './components/Managing_Click_Event';


function buttonOnClick(){
  alert("You have clicked the button")
}

function App() {

  const carObject = {
    brand: "Volvo",
    countryOfOrigin: "Sweden",
    productionDate: 1927
  }

  return (
    <div>
    <JSX_Immediately_invoked_function/>

    <JSX_Loop/>

    <JSX_Conditional_Rendering_Using_If_Else/>

    <JSX_Conditional_Rendering_Using_switch/>

    <JSX_Conditional_Rendering_Using_Ternary_Operator/>

    <JSX_Conditional_Rendering_Using_And_And_Operator/>

    <JSX_Passing_Properties_String_to_This_Child_Component
    message='This is a String from parent component'/>

    <JSX_Passing_Properties_Object_to_This_Child_Component car={carObject}/>

    <JSX_Passing_Properties_Function_to_This_Child_Component func={buttonOnClick}/>

    <ButtonComponent/>
    </div>
  );
};

export default App;
```

12.Main.jsx of this chapter:

```jsx
import React from 'react'
import ReactDOM from 'react-dom/client'
import App from './App.jsx'


ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    <App />
  </React.StrictMode>,
)

```


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13.Output Result of this chapter:

JSX_Immediately_invoked_function:

A+

JSX_Loop:

- Honda
- Ford
- Toyota

JSX_Conditional_Rendering_Using_If_Else:

Logout
Log out

JSX_Conditional_Rendering_Using_Ternary_Operator:

Login

JSX_Conditional_Rendering_Using_And_And_Operator

Logout

JSX_Passing_Properties_String_to_This_Child_Component:

message from parent component:

This is a String from parent component

JSX_Passing_Properties_Object_to_This_Child_Component

message from parent component:

- Name of the brand: Volvo
- Origin country of the brand: Sweden
- Date of origination: 1927

JSX_Passing_Properties_Function_to_This_Child_Component

function from parent component:

Submit

Managing_Click_Events

Button component for managing click events

Submit

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3. React Hook and State Manager:

1. useRef

Changing the innerText

1_useRef_InnerText.jsx file:

```jsx
import { useRef, React } from "react";
function UseRef_InnerText(){
    let myHeading = useRef()
    function changeHeader(){
        myHeading.current.innerText = "Button is Clicked!"
    }
    return (
        <div>
            <h1 ref={myHeading}>useRef_InnerText</h1>
            <button onClick={changeHeader}>Click</button>
        </div>
    )
}
export default UseRef_InnerText;
```

App_components2_react_hook.jsx file:

```jsx
import { useState, React, useRef } from 'react'
import UseRef_InnerText from './components2_react_hook/1_useRef_InnerText';
function App2() {
  return (
    <div>
    <UseRef_InnerText/>
    </div>
  );
};
export default App2;
```


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Main.jsx file:

```jsx
import React from 'react'
import ReactDOM from 'react-dom/client'
import App from './App.jsx'
import App2 from './App_components2_react_hook.jsx'

ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    {/* <App /> */}
    <App2/>
  </React.StrictMode>,
)
```

Changing the innerHtml

```jsx
import { useRef, React } from "react";
function UseRef_InnerHTML(){
    let myHeading = useRef()
    function changeHeader(){
        myHeading.current.innerHTML = "<ul><li>Hi</li></ul>"
    }
    return (
        <div>
            <h1 ref={myHeading}>useRef_InnerHTML</h1>
            <button onClick={changeHeader}>Click</button>
        </div>
    )
}
export default UseRef_InnerHTML;
```


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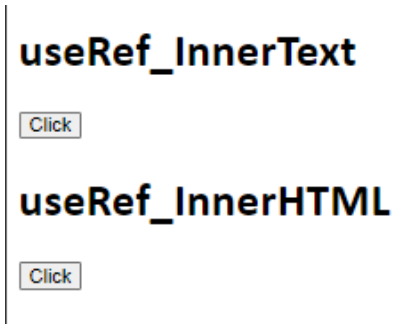
Compile Results:

Befor:



After:

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Changing the innerText or HTML by arrow function:

- Compile results will be same as before
- Don't forgot to remove "current" keyword

```
import { useRef, React } from "react";

function UseRef_InnerHTML_with_arrow_function(){
    let myHeading = useRef()

    function changeHeader(){
        myHeading.innerHTML = "<ul><li>Hi</li></ul>"
    }

    return (
        <div>
            <h1 ref={(h1)=>(myHeading=h1)}>useRef_InnerHTML_with_arrow_function</h1>
            <button onClick={changeHeader}>Click</button>
        </div>
    )
}

export default UseRef_InnerHTML_with_arrow_function;
```


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Setting Attributes:

Changing the 'src' and Height of an image, when a button is clicked:

```
import React from "react";
import { useRef } from "react";

function UseRef_Attribute(){

    const myImg = useRef();

    function onClick(){
        myImg.current.src = "https://placehold.co/600x400/000000/FFF"
        myImg.current.setAttribute("Height", 1000)
    }

    return (
        <div>
        <h3>UseRef_Attribute</h3>
        <img ref={myImg} src="https://placehold.co/600x400" ></img>
        <button onClick={onClick} > Click Me </button>
        </div>
    )
}
export default UseRef_Attribute;
```


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Input Elements:

This code will get the first name and last name, which are entered in the placeholder, and then show them when a button is clicked

```
import React from 'react';
import { useRef } from "react";

function UseRef_InputElements() {
    const firstName = useRef()
    const lastName = useRef()

    function showMessage(){
        let fName = firstName.current.value;
        let lName = lastName.current.value;
        alert("welcome" + " " + fName + " " + lName)
    }

    return (
        <div>
            <h1>UseRef_InputElements</h1>
            <input ref={firstName} placeholder='firstName' />
            <input ref={lastName} placeholder='lastName' />
            <button onClick={showMessage}> click </button>
        </div>
    );
};

export default UseRef_InputElements;
```


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Working with Css:

For this section bootstrap is used, so make sure to install it and then import in in the main.jsx file

Main.jsx:

```
import React from 'react';
import React from 'react'
import ReactDOM from 'react-dom/client'
import App from './App.jsx'
import App2 from './App_components2_react_hook.jsx'
import 'bootstrap'
import 'bootstrap/dist/css/bootstrap.css'


ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    {/* <App /> */}
    <App2/>
  </React.StrictMode>,
```


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Clicking the button will change the header's color. The initial color is green, and it will be changed to red:

```
import React from 'react';
import { useRef } from "react";
function UseRef_Css() {
    const myHeader = useRef()
    function changeColor(){
        myHeader.current.classList.remove('text-success')
        myHeader.current.classList.add('text-danger')
    }
    return (
        <div>
            <h1 className='text-success' ref={myHeader}> UseRef_Css </h1>
            <button onClick={changeColor}> Change Header Color </button>
        </div>
    );
};
export default UseRef_Css;
```


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UseRef and Caching

```
import {React, useRef} from 'react';
function UseRef_Caching() {
    let data = useRef(null)
    const pTag = useRef()
    async function fetchData(){
        try  {
            const response = await  fetch('https://dummyjson.com/carts/1')
            if (!response.ok)
            {
            throw new Error('Network response was not ok.');
            }
            data = await response.json();
        } catch (error) {
            setError(error.message);
            setLoading(false);
        }
    }
    function showData(){
        pTag.current.innerHTML = JSON.stringify(data)
    }
    return (
        <div>
            <h1>UseRef_Caching</h1>
            <p ref={pTag} >Data will be shown here</p>
            <button onClick={fetchData}> FetchData </button>
            <br/>
            <button onClick={showData}> ShowData </button>
        </div>
    );
};
export default UseRef_Caching;
```


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For instance, we want to reuse the result of an API multiple times without recomputing it every time the component renders. We can use useRef to store the API data, eliminating the need to fetch it again.

UseRef_Caching Component

This component demonstrates the use of the useRef hook to cache data and manipulate DOM elements.

useRef Hook

- data: Stores fetched data.
- pTag: References the <p> tag.

fetchData Function

This asynchronous function fetches data from an API and stores it in the data ref. If the fetch operation fails, it catches the error and handles it.

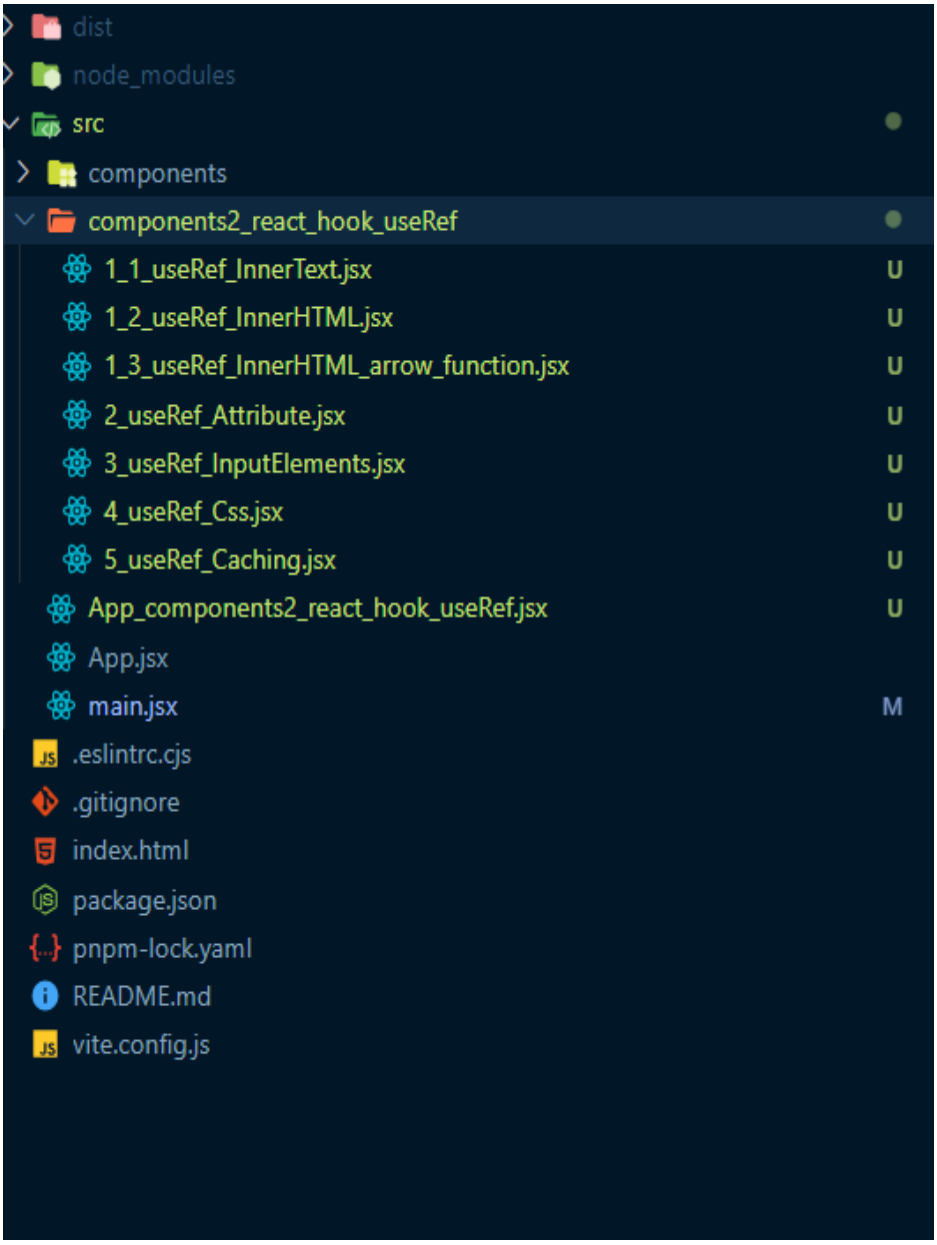
showData Function

This function displays the fetched data inside the <p> tag by updating its innerHTML.

Return Statement

- <h1>: Displays the title “UseRef_Caching”.
- <p>: Placeholder for displaying fetched data.
- <button>: Triggers fetchData function.
- <button>: Triggers showData function.

File structure of useRef Section:



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App.jsx of this chapter:

App.jsx of this chapter is called `App_components2_react_hook_useRef `

```jsx
import { useState, React, useRef } from 'react'
import UseRef_InnerText from './components2_react_hook_useRef/1_1_useRef_InnerText';
import UseRef_InnerHTML from './components2_react_hook_useRef/1_2_useRef_InnerHTML';
import UseRef_InnerHTML_with_arrow_function from './components2_react_hook_useRef/1_3_useRef_InnerHTM
import UseRef_Attribute from './components2_react_hook_useRef/2_useRef_Attribute';
import UseRef_InputElements from './components2_react_hook_useRef/3_useRef_InputElements';
import UseRef_Css from './components2_react_hook_useRef/4_useRef_Css';
import UseRef_Caching from './components2_react_hook_useRef/5_useRef_Caching'

function App2() {

  return (
    <div>
    <UseRef_InnerText/>
    <UseRef_InnerHTML/>
    <UseRef_InnerHTML_with_arrow_function/>
    <UseRef_Attribute/>
    <UseRef_InputElements/>
    <UseRef_Css/>
    <UseRef_Caching/>

    </div>
  );

};

export default App2;
```

Main.jsx of this chapter:

```jsx
import React from 'react'
import ReactDOM from 'react-dom/client'
import App from './App.jsx'
import App2 from './App_components2_react_hook_useRef.jsx'
import 'bootstrap'
import 'bootstrap/dist/css/bootstrap.css'


ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    {/* <App /> */}
    <App2/>
  </React.StrictMode>,
)

```


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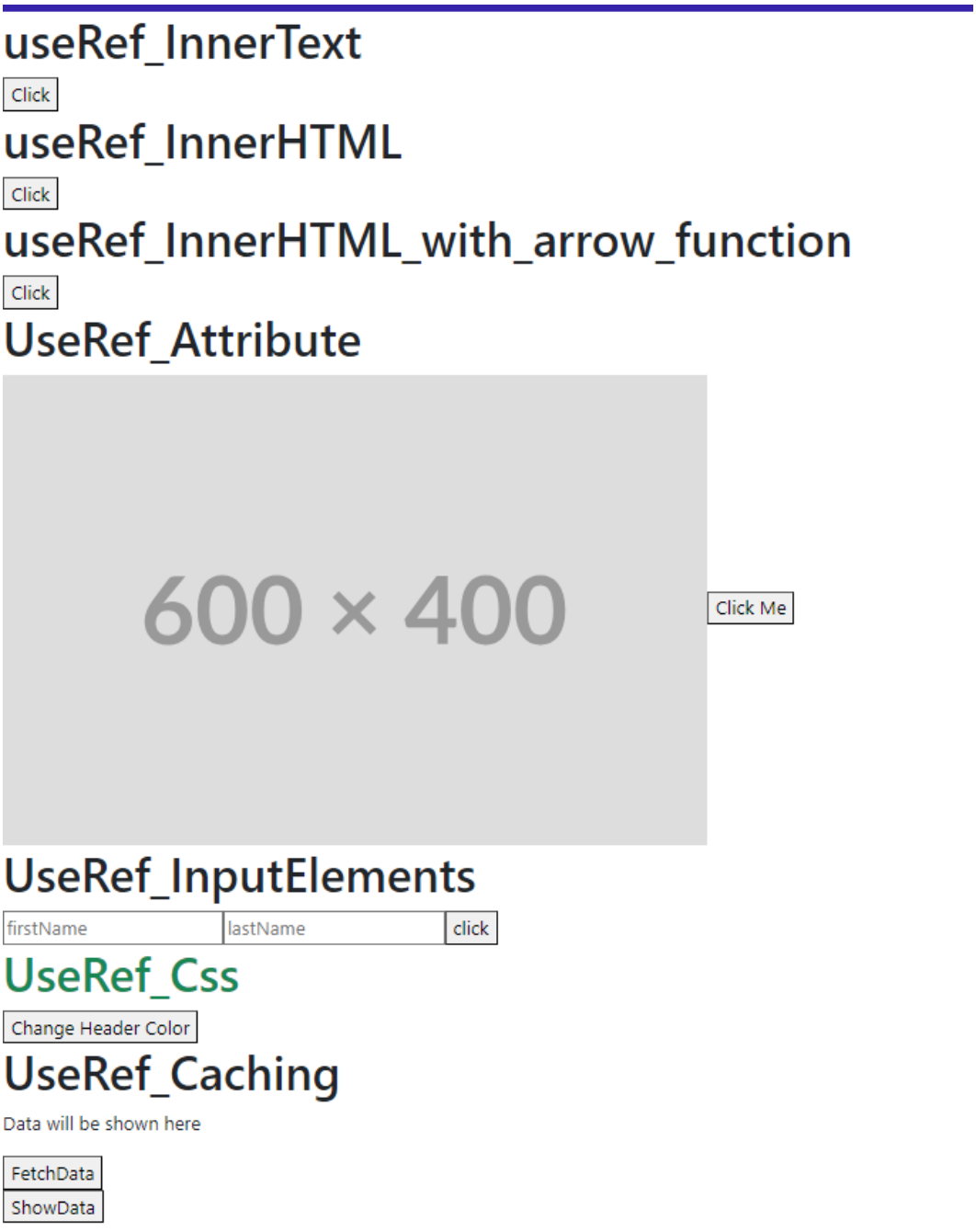
Output Result of this chapter:

Befor clicking:



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After clicking:

Button is Clicked!

Click

- Hi

Click

- Hi

Click

UseRef_Attribute

UseRef_InputElements

df sdf click

UseRef_Css

Change Header Color

UseRef_Caching

{"id":1,"products":[{"id":168,"title":"Charger SXT RWD","price":32999.99,"quantity":3,"total":98999.97,"discountPercentage":13.39,"discountedTotal":85743.87,"thumbn
Grey","price":1999.99,"quantity":2,"total":3999.98,"discountPercentage":18.52,"discountedTotal":3259.18,"thumbnail":"https://cdn.dummyjson.com/products/images/
Earring","price":24.99,"quantity":5,"total":124.94999999999999,"discountPercentage":6.28,"discountedTotal":117.1,"thumbnail":"https://cdn.dummyjson.com/product
Airpods","price":129.99,"quantity":5,"total":649.95,"discountPercentage":12.84,"discountedTotal":566.5,"thumbnail":"https://cdn.dummyjson.com/products/images/m

FetchData

ShowData

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2. useState

useState is a built in react object, which is used to contain data or information of an component.

The state can also be modified based on users inputs or network changes

This example code will increment the number by one after clicking the button:

```
import {React, useState} from 'react'

function UseState(){

    const[number, setNumber]= useState(0)

    return (
        <div>
            <h1>UseState:</h1>
            <h2>Number: {number}</h2>
            <button onClick={ ()=>setNumber(number+1) } >+1</button>
        </div>
    )

}

export default UseState;
```


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Immutable objects:

Example code of creating and showing an Object:

```
import {React, useState} from 'react'

function UseState_Immutable_Objects(){
    const[cars, setCars]= useState({
        name:"chevrolet chevelle malibu",
        cylinders:8,
    })
    return (
        <div>
            <h1>UseState_Immutable_Objects</h1>
            <h2>Name: {cars.name} cylinders: {cars.cylinders}</h2>
        </div>
    )
}
export default UseState_Immutable_Objects;
```


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Example code of changing an Object:

This example code will change the `origin` key, after the button is clicked:

```
import {React, useState} from 'react'

function UseState_Immutable_Objects(){

    const[cars, setCars]= useState({
        name:"chevrolet chevelle malibu",
        cylinders:8,
        origin:""
    })

    function changeCarInfo(){
        setCars( (previousCar) => ( {...previousCar, origin:"USA"} )  )
    }

    return (
        <div>
            <h1>UseState_Immutable_Objects</h1>
            <h2>Name: {cars.name} cylinders: {cars.cylinders}
origin:{cars.origin}</h2>
            <button onClick={changeCarInfo}> add </button>
        </div>
    )
}
export default UseState_Immutable_Objects;
```


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Immutable Arrays (Adding to the Array)

In this code below a simple 'To-Do' app is created:

```jsx
import {React, useState} from 'react'

function UseState_Immutable_Arrays(){

    const [list, setList] = useState([])
    const [item, setItem] = useState("")

    function addItemToList(){
        setList( (previousList) => ([...previousList, item]))
    }

    function showArray(){
        console.log(list)
    }

    return (
        <div>
            <h1>UseState_Immutable_Arrays_adding</h1>
            <table>
                <tbody>
                    { list.length!==0
                    ? (
                        list.map((element,index) => (
                            <tr key={index}>
                                <td>{element}</td>
                            </tr>
                        ))
                    )
                    : (
                        <tr>
                            <td> Add Some Thing </td>
                        </tr>
                    )
                    }
                </tbody>
            </table>
            <input placeholder='item' onChange={(event)=>(setItem(event.target.value))}/>
            <button onClick={addItemToList}> add </button>
            <button onClick={showArray}> show </button>
        </div>
    )
}
export default UseState_Immutable_Arrays;
```


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Immutable Arrays (Delete Array Element)

In the code below, a new button called 'Remove Item' is added, which will trigger a function to delete that specific element from the array holding the to-do list elements.

```jsx
import {React, useState} from 'react'

function UseState_Immutable_Arrays_Deleting_Array_Element(){

    const [list, setList] = useState([])
    const [item, setItem] = useState("")

    function addItemToList(){
        setList( (previousList) => ([...previousList, item]))
    }

    function removeItem(index){
        list.splice(index, 1);
        setList([...list])
    }

    return (
        <div>
            <h1>UseState_Immutable_Arrays_Deleting_Array_Element</h1>
            <table>
                <tbody>
                    { list.length!==0
                      ? (
                            list.map((element,index) => (
                                <tr key={index}>
                                    <td>{element}</td>
                                    <td> <button onClick={(index)=>(removeItem(index))}> Remove Item </button> </td>
                                </tr>
                            ))
                        )
                        : (
                            <tr>
                                <td> Add Some Note </td>
                            </tr>
                        )
                    }
                </tbody>
            </table>
            <input placeholder='item' onChange={(event)=>(setItem(event.target.value))}/>
            <button onClick={addItemToList}> add </button>
        </div>
    )
}
export default UseState_Immutable_Arrays_Deleting_Array_Element;
```


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Immutable Arrays (Delete Array Element)*common method:

In the code below, the removeItem function has been updated to demonstrate a more efficient and commonly used method for deleting an element from an array

```jsx
import {React, useState} from 'react'

function UseState_Immutable_Arrays_Deleting_Array_Element(){

    const [list, setList] = useState([])
    const [item, setItem] = useState("")

    function addItemToList(){
        setList( (previousList) => ([...previousList, item]))
    }

    // function removeItem(index){
    //     list.splice(index, 1);
    //     setList([...list])
    // }

    function removeItem(index){
        setList( (previousList) => previousList.filter( (_ , itemIndex) => (itemIndex !== index) ))
    }

    return (
        <div>
            <h1>UseState_Immutable_Arrays_Deleting_Array_Element</h1>
            <table>
                <tbody>
                    { list.length!==0
                      ? (
                            list.map((element,index) => (
                                <tr key={index}>
                                    <td>{element}</td>
                                    <td> <button onClick={()=>(removeItem(index))}> Remove Item </button> </td>
                                </tr>
                            ))
                        )
                        : (
                            <tr>
                                <td> Add Some Note </td>
                            </tr>
                        )
                    }
                </tbody>
            </table>
            <input placeholder='item' onChange={(event)=>(setItem(event.target.value))}/>
            <button onClick={addItemToList}> add </button>
        </div>
    )
}
export default UseState_Immutable_Arrays_Deleting_Array_Element;
```


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Managing forms:

- Define an Object in useRef:
- Write a Function to Manage Input Changes:
- Create a Form
- Add Values to Inputs Using the Reference:
- Add onChange Attribute to Inputs:
- Write an Function to Manage the Form on Submit

```jsx
import React, { useState } from "react";

function Use_State_Manage_Form() {
  let [formObj, setFormObj] = useState({
    fName: "",
    lName: "",
    city: "",
    gender: "",
  });

  // By using [property], you're telling JavaScript to use the value of
  // the property variable as the key, rather than the string "property".

  function inputOnChange(property, value) {
    setFormObj((prevObj) => ({ ...prevObj, [property]: value }));
  }

  function formSubmit(event){
    event.preventDefault()
    console.log(formObj)
  }

  return (
    <div>
      <h1>Use_State_Manage_Form</h1>
      <form onSubmit={formSubmit}>
        <div className="row">
          <div className="col col-md-6">
            <input
              placeholder="First name"
              value={formObj.fName}
              type="text"
              onChange={(e) => inputOnChange("fName", e.target.value)}
              className="form-control"
            />
            <br />
            <input
              placeholder="Last name"
              value={formObj.lName}
              type="text"
              onChange={(e) => inputOnChange("lName", e.target.value)}
              className="form-control"
            />
            <br />
```


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```
            <select
              value={formObj.city}
              onChange={(e) => inputOnChange("city", e.target.value)}
              className="custom-select mr-lg-3">
              <option value="">Select City</option>
              <option value="New york">New York</option>
              <option value="Berlin">Berlin</option>
            </select>
            <br />

            <div class="form-check form-check-inline">
              <input
                type="radio"
                checked={formObj.gender === "male"}
                onChange={() => inputOnChange("gender", "male")}
                name="gender"
                value="male"
              />
              Male
              <input
                type="radio"
                checked={formObj.gender === "female"}
                onChange={() => inputOnChange("gender", "female")}
                name="gender"
                value="female"
              />
              Female
            </div>
            <br />

            <button type="submit" class="btn btn-primary">
              Submit
            </button>
          </div>
        </div>
      </form>
    </div>
  );
}

export default Use_State_Manage_Form;
```


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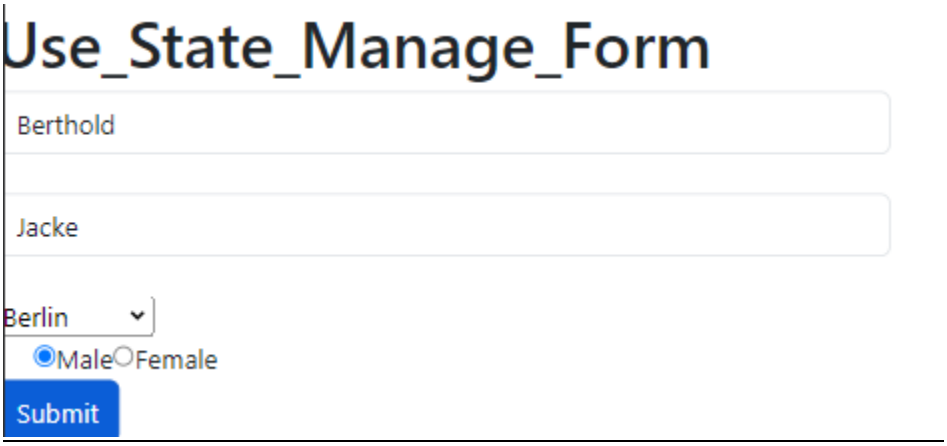
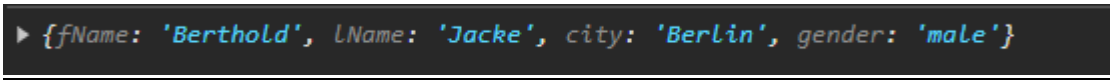
Compile Result:





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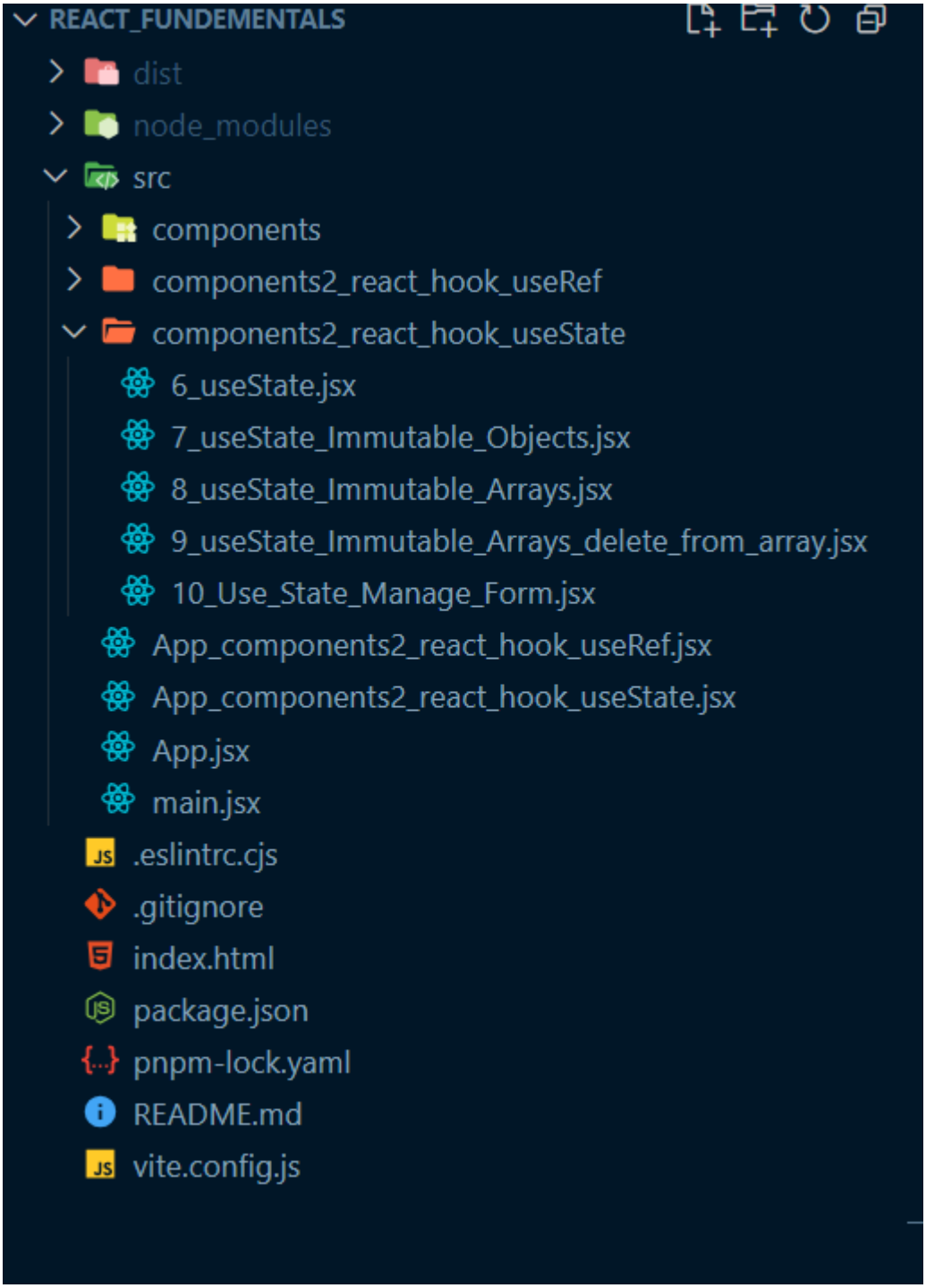
File structure of useRef Section:



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App.jsx of this chapter:

App.jsx of this chapter is called `App_components2_react_hook_useState`

```jsx
import { useState, React, useRef } from 'react'
import UseState from './components2_react_hook_useState/6_useState';
import UseState_Immutable_Objects from './components2_react_hook_useState/7_useState_Immutable_Objects';
import UseState_Immutable_Arrays from './components2_react_hook_useState/8_useState_Immutable_Arrays';
import UseState_Immutable_Arrays_Deleting_Array_Element from './components2_react_hook_useState/9_useState_Immutable_Arrays_delete_from_array';
import Use_State_Manage_Form from './components2_react_hook_useState/10_Use_State_Manage_Form';


function App3() {

  return (
    <div>
    <UseState/>
    <UseState_Immutable_Objects/>
    <UseState_Immutable_Arrays/>
    <UseState_Immutable_Arrays_Deleting_Array_Element/>
    <Use_State_Manage_Form/>
    </div>
  );

};

export default App3;
```

Main.jsx of this chapter:

```jsx
import React from 'react'
import ReactDOM from 'react-dom/client'
import App from './App.jsx'
import App2 from './App_components2_react_hook_useRef.jsx'
import 'bootstrap'
import 'bootstrap/dist/css/bootstrap.css'
import App3 from './App_components2_react_hook_useState.jsx'


ReactDOM.createRoot(document.getElementById('root')).render(
  <React.StrictMode>
    {/* <App /> */}
    {/* <App2/> */}
    <App3/>
  </React.StrictMode>,
)

```


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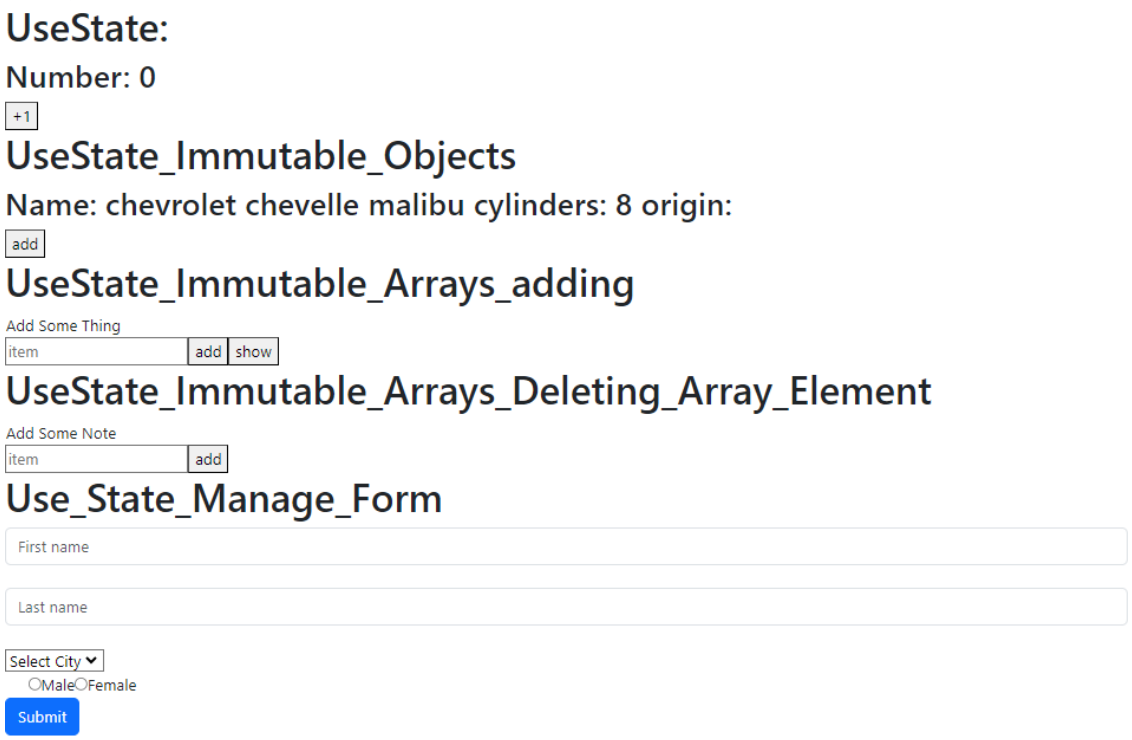
Output Result of this chapter:



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3. useEffect

Synchronizing with Effects[1]

- Some components need to synchronize with external systems. For example, you might want to control a non-React component based on the React state, set up a server connection, or send an analytics log when a component appears on the screen. Effects let you run some code after rendering so that you can synchronize your component with some system outside of React.
- Sometimes this isn't enough. Consider a ChatRoom component that must connect to the chat server whenever it's visible on the screen. Connecting to a server is not a pure calculation (it's a side effect) so it can't happen during rendering. However, there is no single particular event like a click that causes ChatRoom to be displayed.
- Effects let you specify side effects that are caused by rendering itself, rather than by a particular event. Sending a message in the chat is an event because it is directly caused by the user clicking a specific button. However, setting up a server connection is an Effect because it should happen no matter which interaction caused the component to appear. Effects run at the end of a commit after the screen updates. This is a good time to synchronize the React components with some external system (like network or a third-party library).
- Don't rush to add Effects to your components. Keep in mind that Effects are typically used to "step out" of your React code and synchronize with some external system. This includes browser APIs, third-party widgets, network, and so on. If your Effect only adjusts some state based on other state, you might not need an Effect.

[1] https://react.dev/learn/synchronizing-with-effects

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