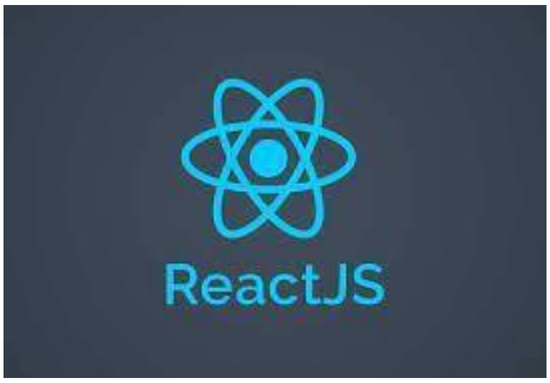
ReactJS

- ✓ ReactJS is **JavaScript library**
- ✓ ReactJS Released by **Facebook**
- ✓ Current version of ReactJS is **18.X**
- ✓ ReactJS used to develop **web applications**
- ✓ We will develop ReactJS Applications in **two ways**
  1) JSX 2) TSX



Features of ReactJS

1) Components

- ✓ Each Partition of webpage called as Component
- ✓ We can create more than one component
- ✓ Components are reusable
- ✓ We can provide communication between components
- ✓ We can create components in two ways
  1) Class Components
  2) Functional Components

Example

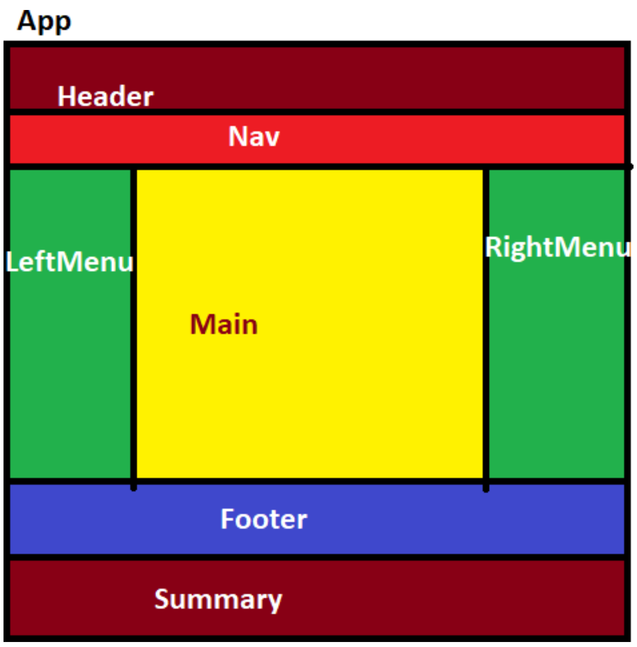
In this diagram we have **following Components**

ParentComponent

1) AppComponent

ChildComponent

1)HeaderComponent
2)NavComponent
3)LeftMenuComponent
4)MainComponent
5)RightMenuComponent
6)FooterComponent
7)SummaryComponent



Differences Between class level components and functional level components

Functional Components	**Class Components**
1) We **can't create object** to functional components	We **can create object** to class components
2) These components are also called as **temporary components**	These components are existed at the **end of process (Container Components)**
3) These components are called as **stateless components**	These components are called as **stateful components**
4) Supports **Hooks**	Supports **life cycle methods**
5) We can't **reuse** stateless components	We can reuse **stateful** components
6) These components are **easy** to understand	These components are **difficult** to understand
7) We will write html in **return method**	We will write html in **render () hook**

2) JSX

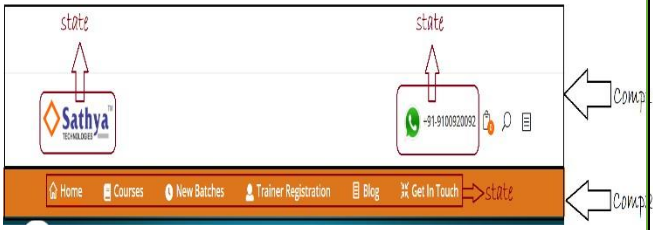
- ✓ JSX Stands for **JavaScript XML**
- ✓ JSX allows us to write **HTML** directly within the **JavaScript code**
- ✓ JSX used to implement **React Applications**
- ✓ JSX is an extension of the **JavaScript language**
- ✓ **Babel** will convert **JSX Expressions/Syntax** to Actual **JavaScript Code**

What are the Differences between JSX and TSX?

JSX	**TSX**
JSX Stands for **JavaScript XML**	TSX Stands for TypeScript XML
JSX Wont follows OOPS	TSX follows OOPS
JSX is not strict type var x=100;	TSX is strict Type var x: number=100;
In JSX we will write HTML into JavaScript	In TSX we will write HTML to TypeScript

3) State

- ✓ state is predefined object
- ✓ state used to store the component data
- ✓ state is mutable
- ✓ whenever state changes automatically component re-renders



state in functional components

- ✓ useState () is the hook used to define state in functional components
- ✓ useState () hook will return array

Examples:

number

```
const [num, setNum] =useState (100);
<h1>{num}</h1>    Output: 100
setNum (200);
<h1>{num}</h1>    Output: 200
```

string

```
const [str, setStr] =useState(`ReactJS`);
<p>{str}</p>             //ReactJS
setStr (`ReactJS18.X`);
 <p>{str}</p>             //ReactJS18.X
```

boolean

```
const [flag, setFlag] =useState(true);
<h1>{flag}</h1>        //true
const [flag1,setFlag1] =useState(false);
<h1>{flag1} </h1>       //false
```

conditional rendering

```
 const [x, setX] =useState(`Java`);
 const [y, setY] =useState(`ReactJS`);
 const [z,setZ]= useState(true);
 {
        z? <h1>{x}</h1>:<h1>{y}</h1>
}
//Java
```

lists

```
const [arr1, setArr1] =useState ([10,20,30,40,50]);
 {
        arr1.map ((element, index) => {
             return (<h1 key={index}>{element}</h1>)
        })
 }
```

map () method used to iterate **list items** in **reactjs**

key property used to **tract** list items

json object

```
const [obj, setObj] =useState({key1: `Hello_1`,key2:`Hello_2`,key3:`Hello_3`});
```

```
<h1>{obj.key1} …. {obj.key2} …{obj.key3} </h1>
                                        //Hello_1…. Hello_2…. Hello_3
```

Array of objects

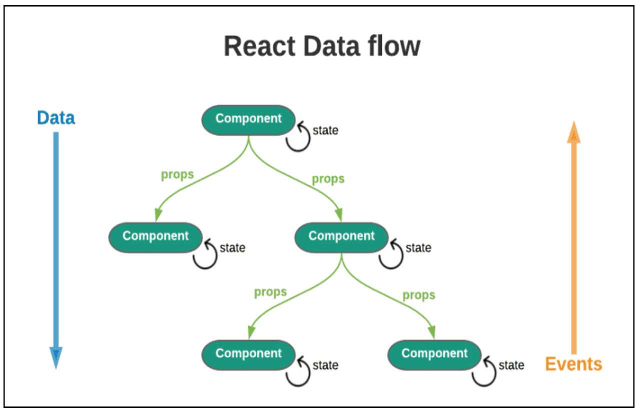
```
const [products, setProducts] =useState ([{p_id:111,
p_name:'p_one',p_cost:10000},
{ p_id:222,p_name:'p_two',p_cost:20000},
{ p_id:333,p_name:'p_three',p_cost:30000},
{p_id:444, p_name:'p_four', p_cost:40000},
{p_id:555, p_name:'p_five', p_cost:50000}]);

<table>
    <tr>
       <th>p_id</th>
        <th>p_name</th>
        <th>p_cost</th>
     </tr>
     {
         products.map ((element, index) => {
              return (<tr key={index})>
                             <td>{element. p_id} </td>
                             <td> {element. p_name} </td>
                             <td> {element. p_cost} </td>
                        </tr>)
         })
     }
  </table>
```

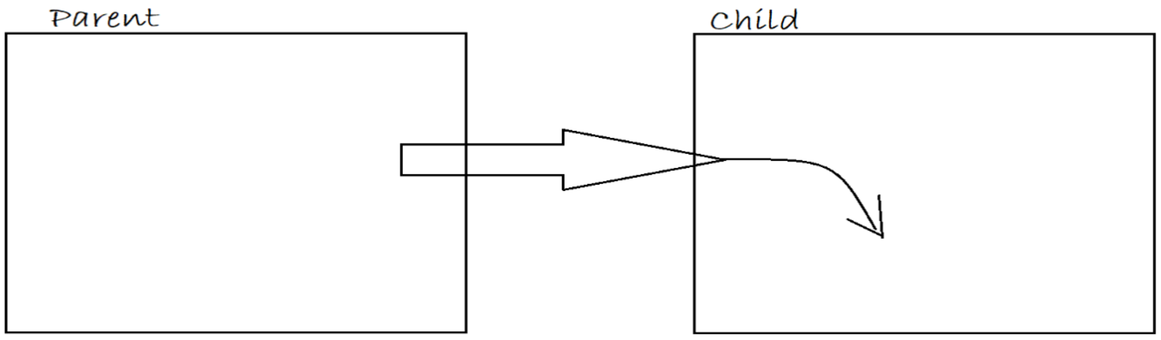
State in class level components

- ✓ state is predefined object used to define state in class level components
  Ex.
  ```
  this. state= {
      num:100
  }
  <h1>{this.state.num} </h1>     Output:100
  ```
- ✓ setState () is the predefined method used to change the state in class level components
  ```
  this. setState (() => {
      num: 200
  })
  <h1>{this.state.num} </h1>     Output:200
  ```

4) props

- ✓ props are the predefined object in reactjs
- ✓ props are used to provide communication between components
- ✓ child component receives the data from parent component with the help of props
- ✓ props are immutable





Parent
****

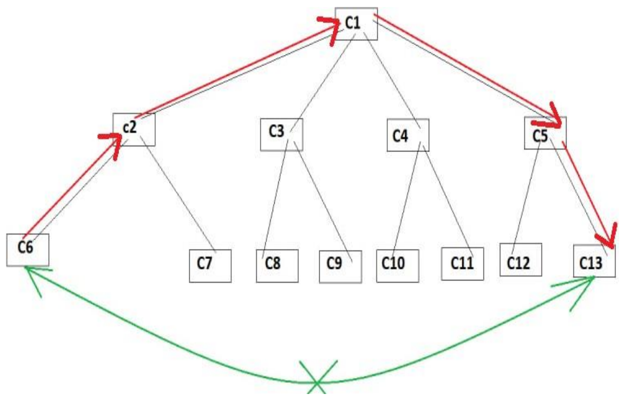
<Child key1=" Sathya">
</Child>

Child
****

<h1>{props.key1} </h1>
Output: Sathya

Props Drilling

- ✓ sharing data from **source component** to **destination component** through several **interdependent components** called as **props drilling**



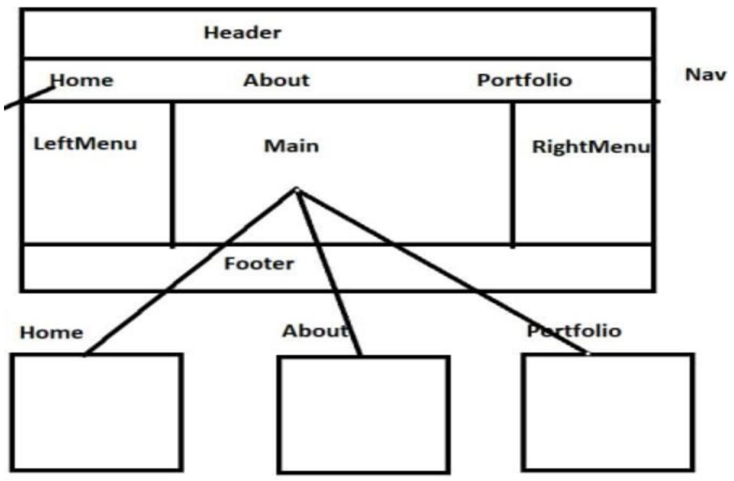
- ✓ In above diagram following **c6 component** is **source component**
- ✓ In above diagram following **c13 component** is **destination component**
- ✓ C2, C3,C5 and C13 components are **interdependent components**
- ✓ props drilling never **recommended** in application development
- ✓ **state management** is used to overcome props drilling
- ✓ we can implement state management in two ways
  1) **Context API**
  2) **Redux**

5) Single Page Applications

- ✓ Dynamically rewrites the **component content** from **server** without **refreshing** called as **Single Page Application**
- ✓ **Navigation** of **one component to another component** without **refreshing** in single page application called as **Routing**

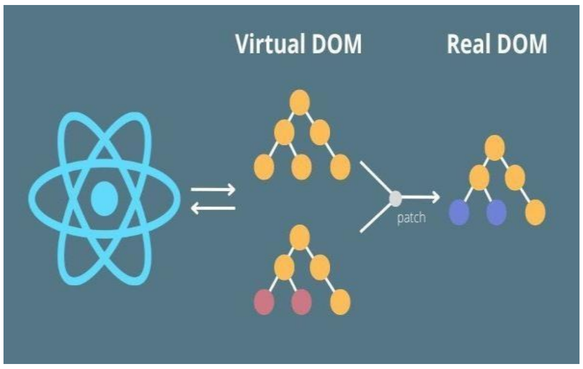
(or)

- ✓ **Binding** an URL to component called as **Routing**
- ✓ **Route** is used to implement **Routings** in Single Page Application
- ✓ **Routes** is used to encapsulate all **child Routes**
- ✓ **BrowserRouter** is used for handling the **dynamic URL.**
- ✓ **HashRouter** is used for handling the **static request**
- ✓ **useParams ()** is the hook used to handle **Routing Parameters**
- ✓ **useNavigate ()** is the hook used to **navigate** from one component to another component in single page applications
- ✓ a path consisting of two asterisks (**) called as **Wildcard route in react**
- ✓ if no route matches automatically Wildcard **route will execute**
- ✓ default route endpoint equals to **"/"**
- ✓ **Outlet** allows child components to **render**
- ✓ **Outlet** behaves like **place holder**
- ✓ **React-router-dom@6** package required to implement single page applications
- ✓ We will download above package in two ways
  1) yarn
  2) npm
- ✓ below command used to download with the help of yarn
  - ➢ yarn add react-router-dom@6
- ✓ npm stands for **node packaging manager**
- ✓ below command used to download with the help of **npm**
  - ➢ npm install react-router-dom@6



6) virtual DOM

- ✓ A virtual DOM is a lightweight JavaScript representation of the Document Object Model (DOM)
- ✓ Updating the virtual DOM is comparatively faster than updating the actual DOM
- ✓ In Virtual DOM, only Changed Element will Reload Instead of All Elements
- ✓ Because of Virtual DOM Application Performance Increases

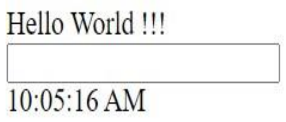


index.html

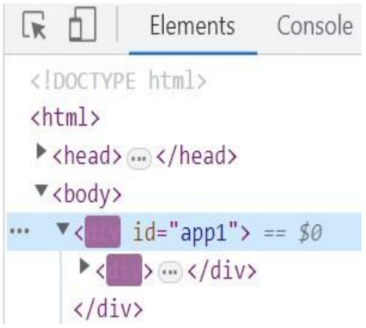
```html
<!DOCTYPE html>
<html>
   <head>
      <title>Virtual DOM</title>
   </head>
   <body>
      <div id="app1"></div>
      <br><br>
      <script src="index.js"></script>
   </body>
</html>
```

index.js

```javascript
setInterval (() => {
   const element1=`
      <div>
         <div>
            Hello World!!!
         </div>
         <div>
            <input type="text" />
         </div>
         <div>
            ${new Date (). toLocaleTimeString ()}
         </div>
      </div>
   `;
   document.getElementById("app1").innerHTML=element1;
},1000);
```



```
Hello World !!!

10:05:16 AM
```



```
<!DOCTYPE html>
<html>
 ▶<head>…</head>
 ▼<body>
… ▼<div id="app1"> == $0
    ▶<div>…</div>
   </div>
```

Note1: all divisions are refreshing
Note2: Application performance Degrad

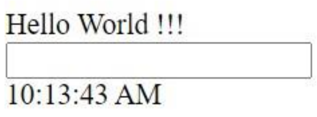
ReactJS

Index.html

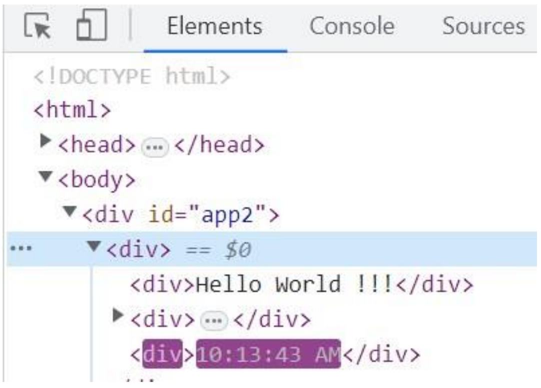
```
<!DOCTYPE html>
<html>
  <head>
    <title>Virtual DOM</title>
  </head>
  <body>
    <div id="app2"></div>
    <script src="index.js"></script>

<script crossorigin
src="https://unpkg.com/react@18/umd/react.development.js"></script>
    <script crossorigin src="https://unpkg.com/react-dom@18/umd/react-
dom.development.js"></script>

  </body>
</html>
```

Index.js

```
setInterval (() => {
 const element2=React.createElement('div’, null,
         React.createElement('div',null,'Hello World !!!'),
         React.createElement('div',null,React.createElement('input',{type:'text'
})),
         React.createElement('div',null,new Date().toLocaleTimeString()));
  ReactDOM.render(element2,document.getElementById("app2"));
},1000);
```



```
Hello World !!!

10:13:43 AM
```



```
<!DOCTYPE html>
<html>
  ▶<head>…</head>
  ▼<body>
    ▼<div id="app2">
  …   ▼<div> == $0
          <div>Hello World !!!</div>
        ▶<div>…</div>
          <div>10:13:43 AM</div>
```

Note: only one div will refresh instead of all divs

7) React Element

- ✓ Elements are the **smallest building blocks** of React apps
- ✓ An element describes **what we want to see** on the screen
- ✓ React elements are **plain objects**
- ✓ **React DOM** takes care of **updating the DOM** to match the **React elements**.

Example

```
const root = ReactDOM.createRoot(
  document. getElementById('root')
);
const element = <h1>Hello, world</h1>;
root. render(element);
```

8) Expressions/Interpolation/Data Binding

- ✓ {} called as Expressions/Interpolation/Data Binding
- ✓ Whatever we written inside expression will be evaluate

Ex.

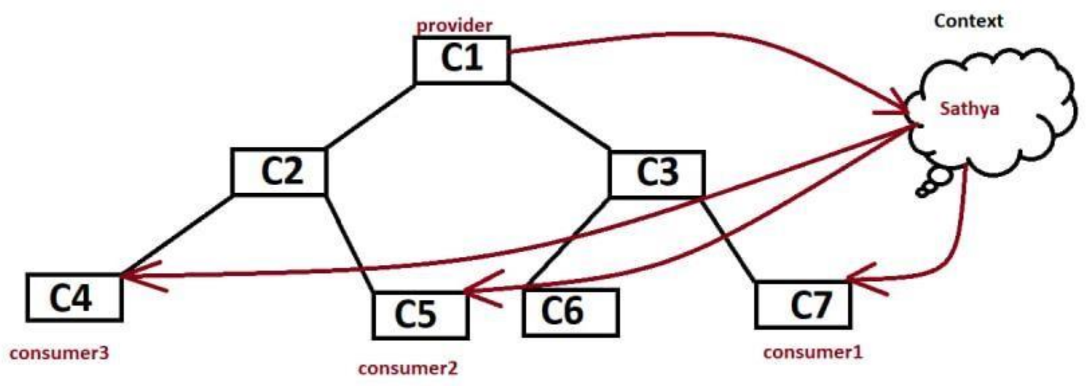
```
const [str, setStr] =useState("Sathya");
<h1>{str}</h1>           //Output: Sathya

<h1> {10+10} </h1>    //Output:20
```

9) State Management

- ✓ State Management is the Technique
- ✓ It is used to provide **communication** between components and **sharing** data between components
- ✓ We can implement State management in two ways
  1) Context API
  2) Redux

Context API

- ✓ Context API used to implement State Management in React Applications
- ✓ Context API overcomes the props drilling
- ✓ By using Context API, we can easily transfer data between components
- ✓ Provider will store data to context
- ✓ Consumer will consume data from context
- ✓ In context API we will use Following Hooks
  1) createContext ()
  2) useContext ()
- ✓ createContext () used to store the data to context
- ✓ useContext () used to read the data from context



Advantages of Context API

- ✓ Context API is inbuilt tool in React library
- ✓ Bundle Size Never increases
- ✓ Requires Minimum Setup for Context API Integration
- ✓ Context API Suitable for Static Data
- ✓ Context API Suitable for Small Scale Web Applications

Disadvantages of Context API

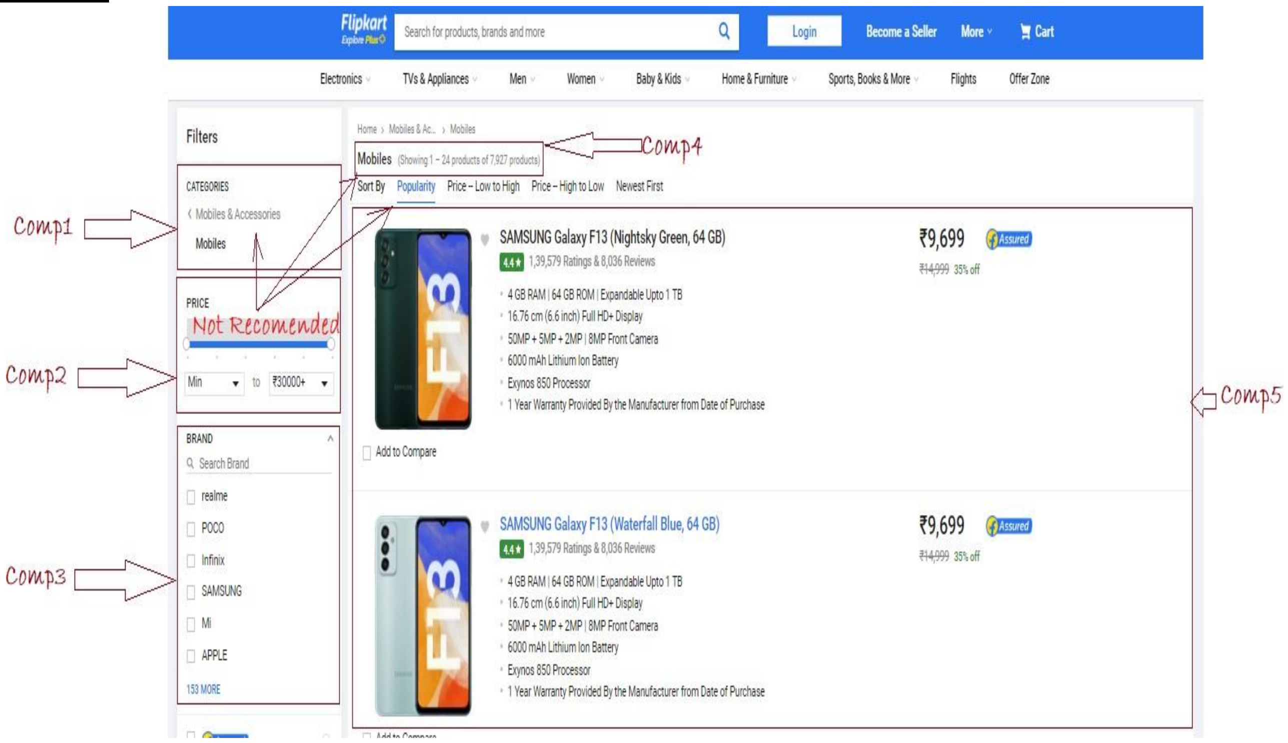
- ✓ Debugging is Difficult
- ✓ Not Suitable for Medium and Large-Scale Web Applications
- ✓ Not Suitable for Dynamic Data (Frequently updating)

Redux

Requirement

1) Cart in Ecommerce Application

Problem


Flipkart
Explore Plus
Search for products, brands and more
Login
Become a Seller
More
Cart
Electronics
TVs & Appliances
Men
Women
Baby & Kids
Home & Furniture
Sports, Books & More
Flights
Offer Zone
Filters
CATEGORIES
Mobiles & Accessories
Mobiles
PRICE
Not Recomended
Min
to
₹30000+
BRAND
Search Brand
realme
POCO
Infinix
SAMSUNG
Mi
APPLE
153 MORE
Home › Mobiles & Ac... › Mobiles
Mobiles (Showing 1 – 24 products of 7,927 products)
Sort By
Popularity
Price – Low to High
Price – High to Low
Newest First
SAMSUNG Galaxy F13 (Nightsky Green, 64 GB)
4.4★ 1,39,579 Ratings & 8,036 Reviews
4 GB RAM | 64 GB ROM | Expandable Upto 1 TB
16.76 cm (6.6 inch) Full HD+ Display
50MP + 5MP + 2MP | 8MP Front Camera
6000 mAh Lithium Ion Battery
Exynos 850 Processor
1 Year Warranty Provided By the Manufacturer from Date of Purchase
₹9,699
Assured
₹14,999 35% off
Add to Compare
SAMSUNG Galaxy F13 (Waterfall Blue, 64 GB)
4.4★ 1,39,579 Ratings & 8,036 Reviews
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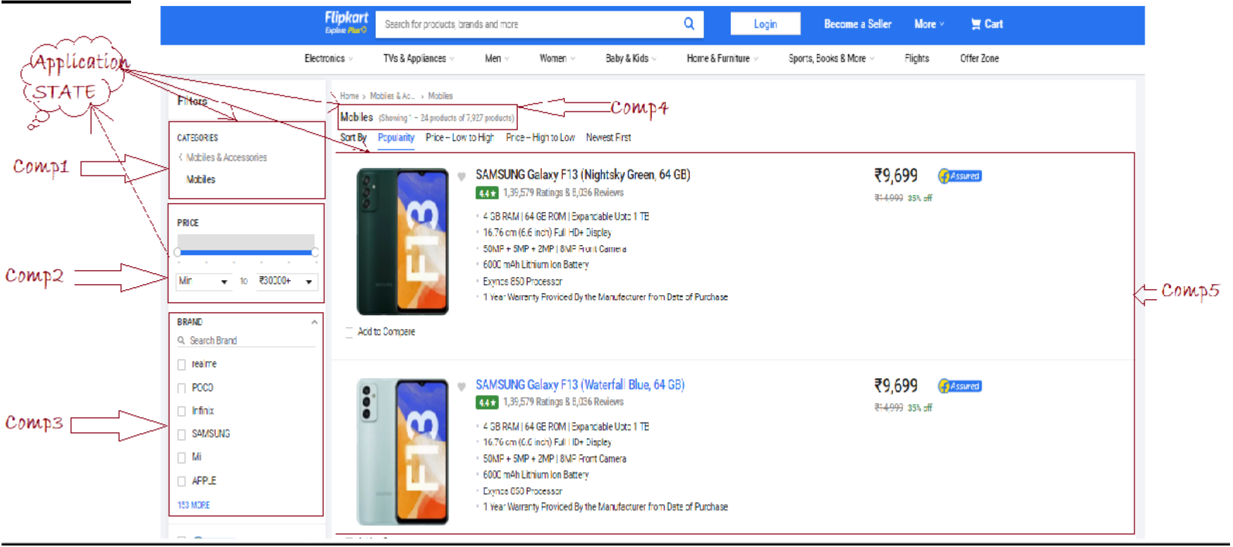
₹9,699
Assured
₹14,999 35% off
Comp1
Comp2
Comp3
Comp4
Comp5

Solution


Application STATE
Comp1
Comp2
Comp3
Comp4
Comp5
Flipkart
Search for products, brands and more
Login
Become a Seller
More
Cart
Electronics
TVs & Appliances
Men
Women
Baby & Kids
Home & Furniture
Sports, Books & More
Flights
Offer Zone
Filters
CATEGORIES
Mobiles & Accessories
Mobiles
PRICE
Min
to
₹30000+
BRAND
Search Brand
realme
POCO
Infinix
SAMSUNG
Mi
APPLE
153 MORE
Home › Mobiles & Ac… › Mobiles
Mobiles (Showing 1 – 24 products of 7,927 products)
Sort By Popularity Price – Low to High Price – High to Low Newest First
SAMSUNG Galaxy F13 (Nightsky Green, 64 GB)
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Exynos 850 Processor
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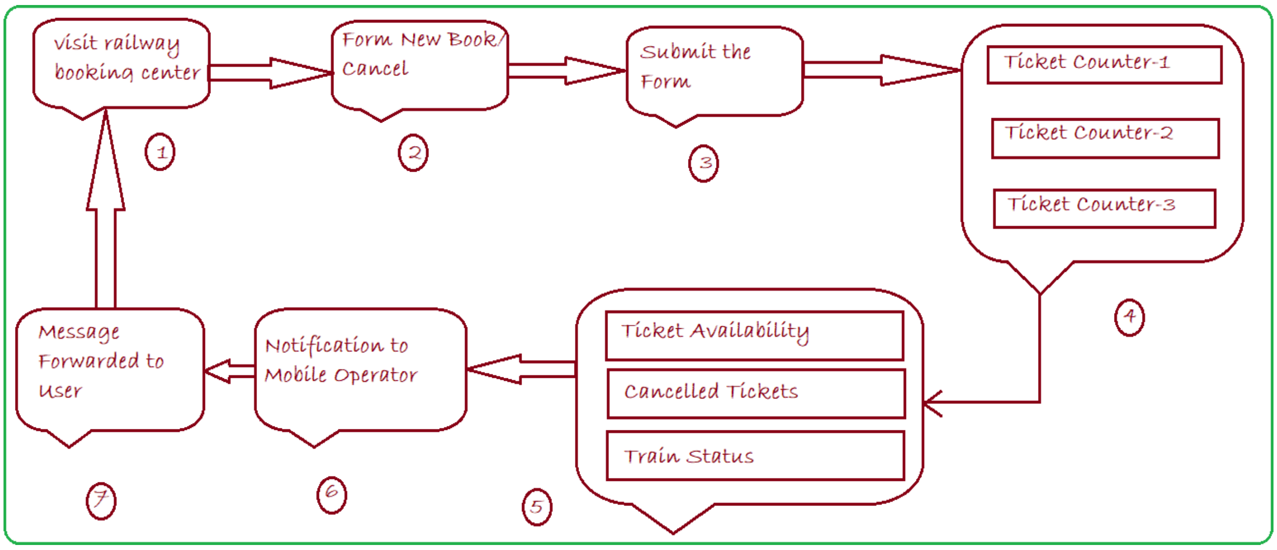
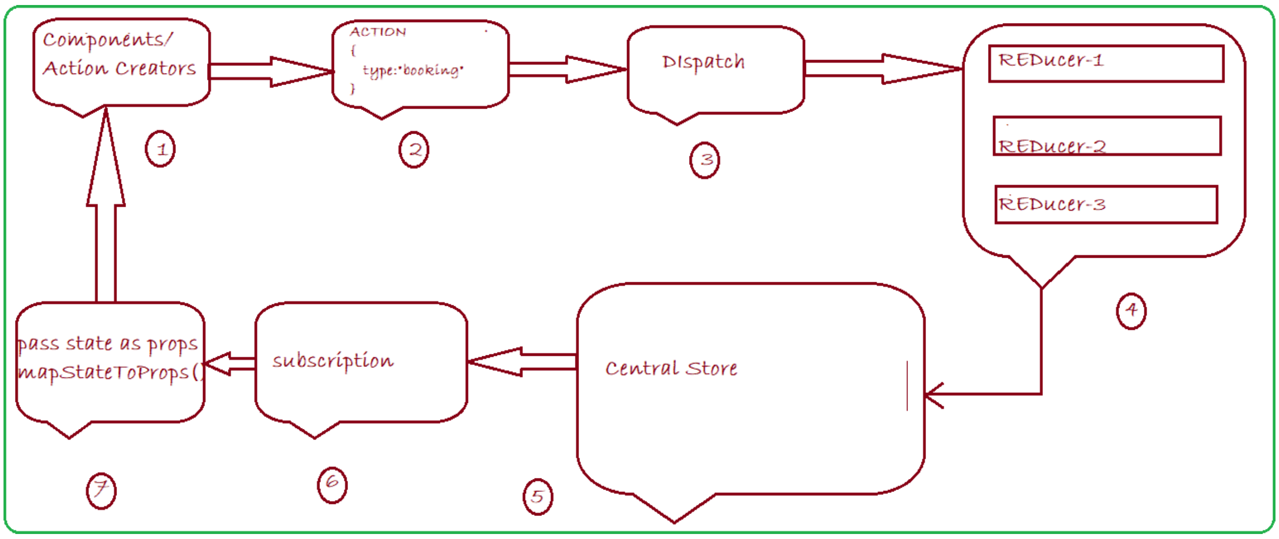
₹14,999 35% off

Example

✓ Railway Booking System




Components/ Action Creators
ACTION { type:'booking' }
Dispatch
REDucer-1
REDucer-2
REDucer-3
Central Store
subscription
pass state as props mapStateToProps()
1
2
3
4
5
6
7

Introduction

- ✓ Redux is a predictable state container for JavaScript apps.
- ✓ Redux used to implement state management in react applications
- ✓ Redux is 3rd party library
- ✓ Redux we can integrate with Angular, React, VueJS and VenillaJS

Principles of Redux

1. Single Store (Object Tree)
2. State is read-only (Only Change State through Actions)
3. Changes are made with pure functions

Advantages of Redux

- ✓ Suitable for Medium and Large Scaled Web Applications
- ✓ Predictable
- ✓ Centralized
- ✓ Debuggable
- ✓ Flexible
- ✓ Suitable for Dynamic Data (Frequent Updates) Ex. Cart

Disadvantages of Redux

- ✓ Bundle Size Increases
- ✓ Steep learning curve
- ✓ Boilerplate code

Analogy of Redux

- ✓ Action
- ✓ Action Creators
- ✓ Reducers
- ✓ Store
- ✓ Subscribe
- ✓ Dispatch

Action

- ✓ source of information to store called as Action
- ✓ Action is plain JavaScript object/JSON Object

  Ex.

```
let actionObj = {
        type: "ADD",
        payload: 10
};
```

Action Creators

- ✓ Action Creators are function will return Actions
- ✓ We can achieve actions reusability through Action Creators

Reducers

- ✓ We will write Business Logic in Reducers
- ✓ We can create more than one reducer
- ✓ Application Readability and Modularity increases with multiple reducers
- ✓ Reducer takes two parameters as input i.e., **action** and **previous state** and return **new state**

Store

- ✓ Store is the main building block in Redux Architecture
- ✓ Store Accommodates both Reducer and Application State
- ✓ We can have only one Store (Application State)

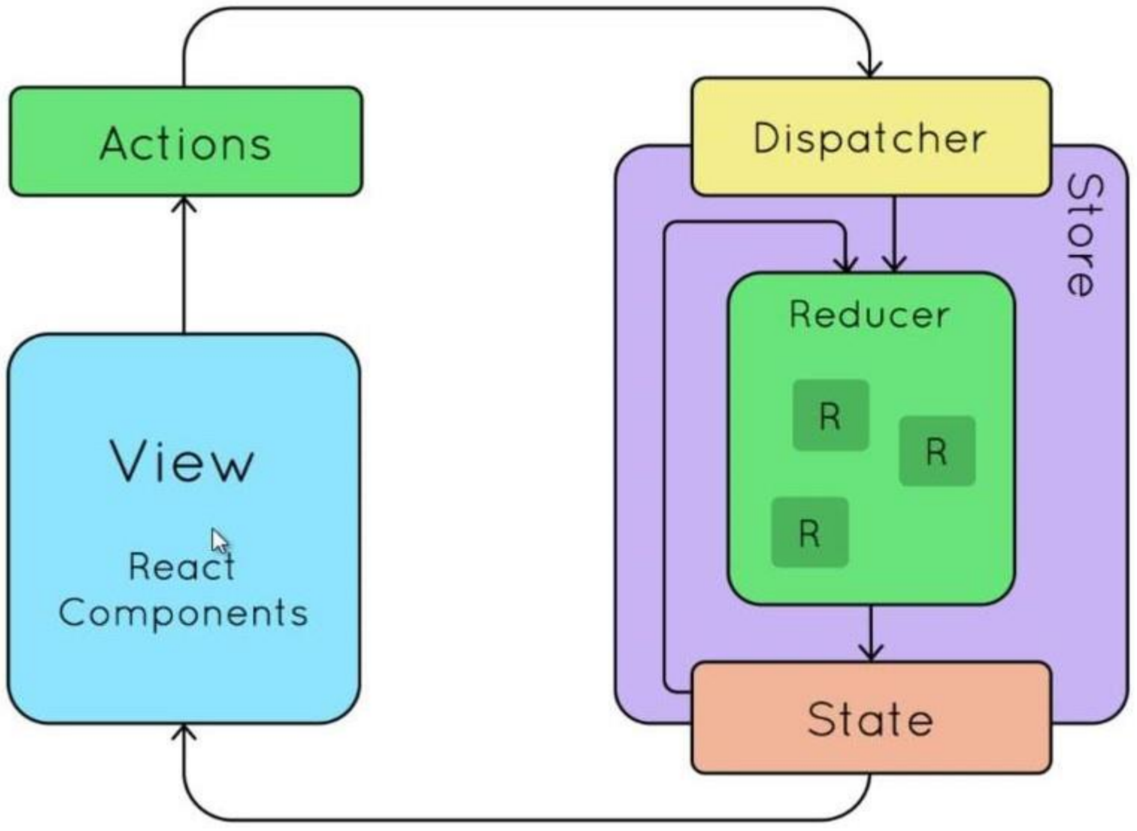
Subscribe

- ✓ The process of Receiving new state from store called as Subscribe
- ✓ Component receives "**new state**" as props with the help mapStateToProps () method

dispatch

- ✓ Process of sending actions to store called as dispatch
- ✓ mapDispatchToProps () method used to perform dispatch operation

Redux Architecture

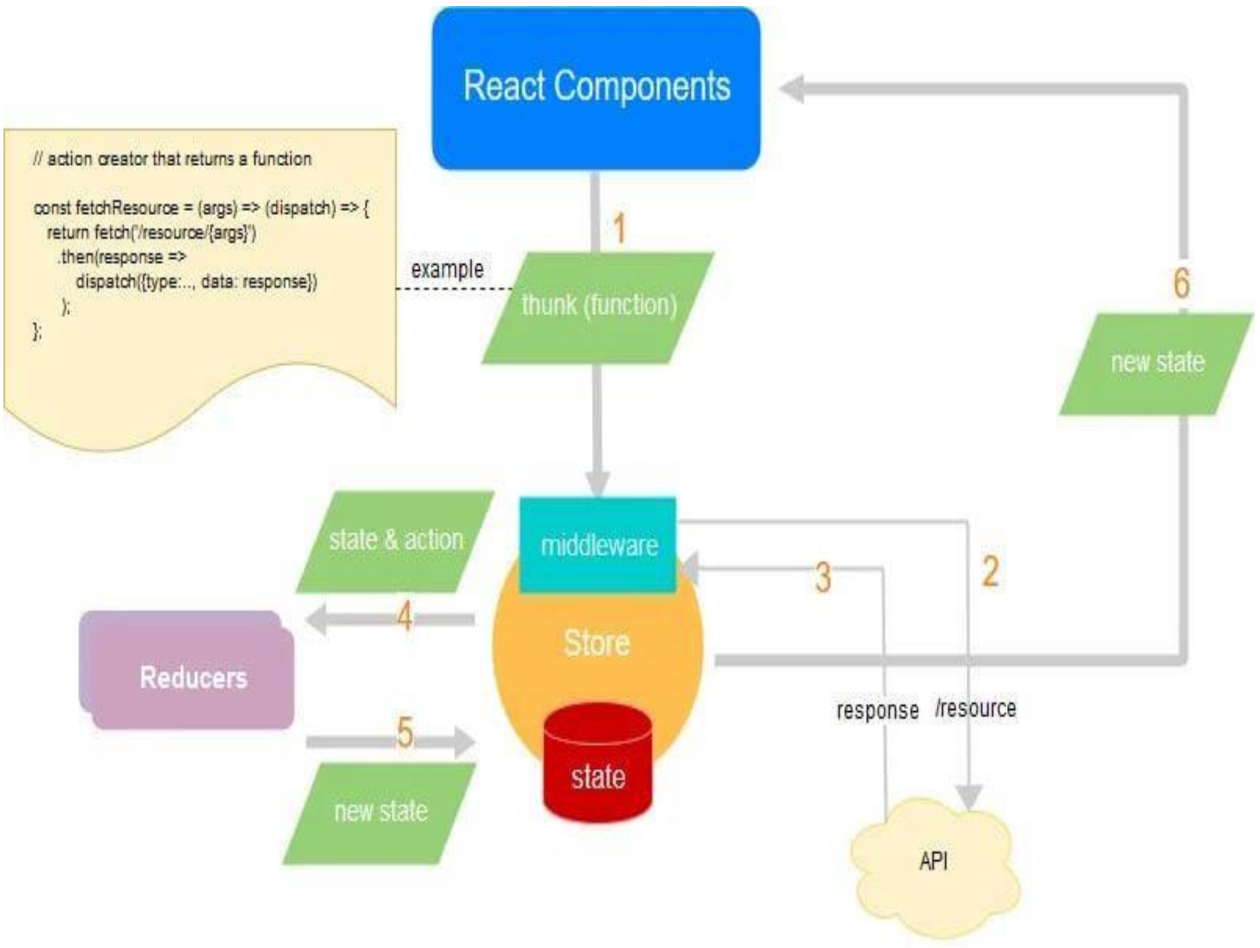


Middleware's

- ✓ Middleware's intercepts the Actions Before Reaching Reducers/Store
- ✓ Middleware's can change/cancel the Actions before Reaching Reducers/Store
- ✓ Redux Supports two Middleware's
    1) Thunk
    2) Saga

Thunk Middleware

- ✓ Thunk is Middleware
- ✓ Thunk Middleware used to delay calculations and evaluation of any operations in Redux Architecture
- ✓ Action Creator will return a function instead of object
- ✓ Returned function will receive two methods from store
    1) dispatch
    2) getState
- ✓ dispatch method used to make synchronous operation after successful completion of asynchronous operations
- ✓ getState () method used to access the state from store



```
// action creator that returns a function

const fetchResource = (args) => (dispatch) => {
  return fetch('/resource/{args}')
    .then(response =>
      dispatch({type:.., data: response})
    );
};
```

Saga Middleware

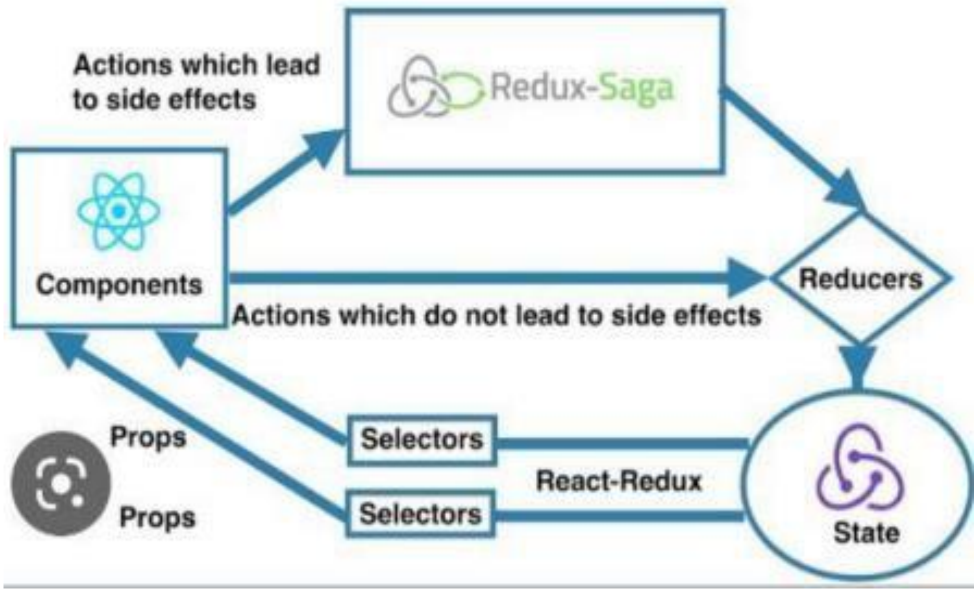
- ✓ Saga is a Middleware
- ✓ Saga Middleware allows store to interact with external resources asynchronously

  Ex.

  Making Http Requests

  Accessing Browser local Storage

  Execution of I/O Operations
- ✓ Above Examples called as Side Effects
- ✓ In Saga Middleware we will use Generator functions
- ✓ Generator functions are introduced in ES6 version


Actions which lead to side effects
Redux-Saga
Components
Reducers
Actions which do not lead to side effects
Props
Props
Selectors
Selectors
React-Redux
State

PRACTICE PAPER-1

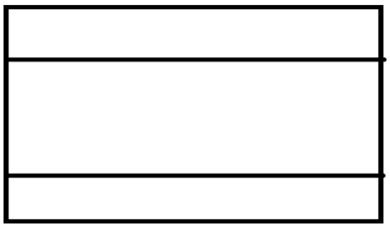
1) What is React?

a) Library b) Framework c) both a&b d) None

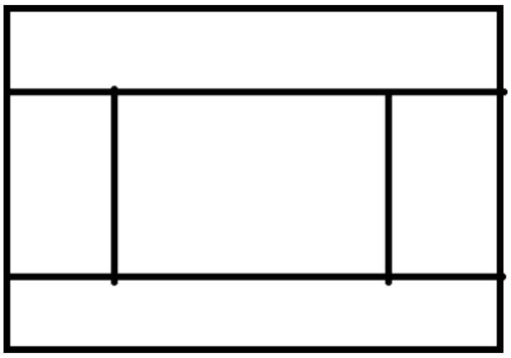
2) What is Component? write minimum 5 Points

Ans:

3) Identify components in below diagram



4) Identify components in below diagram



5) in how many ways can we create components? _____________
6) are functional components are called as stateless components? ___________
7) are class components are called as stateful components? ___________
8) How to enhance functional components _________________
9) how to manage life cycle of class components _______________
10) JSX Stands for______________________
11) TSX Stands for______________________
12) write the differences between JSX and TSX?

13) write the differences between functional components and class components in reactjs?

14) in JSX, we will write HTML to JavaScript? _______________
15) in TSX, we will write TypeScript to HTML? _______________
16) how to tract elements in lists? _________________
17) are React Applications Component Based? _________________
18) are Components Reusable? ____________________
19) can we provide Communication Between Components?___________

PRACTICE PAPER-2

1) What is State? Write few points
   Ans:

2) Explain useState () hook in React
   Ans:

3) const [__, setX] = useState("Hello");
4) const [____ , setNum] = useState (100);
5) const [bool, ______] = useState(true);
6) store value **100 to x** variable
   store value **200 to y** variable
   Find addition of x and y and store to **z variable**
Ans:

7) is state mutable?
   a) yes b) no c) may be d) all
8) store value **Sathya to x** variable
   store value **Technologies to y** variable
   concat both x and y and display result with interpolation
Ans:

9) write the Syntax for conditional rendering
Ans:

10) const [x, setX] =useState(`Java`);

```
const [y, setY] =useState(`ReactJS`);
const [z, setZ] =useState(true);
{
        z? <h1>{x}</h1>:<h1>{y}</h1>
}
```

Ans:

11) how to iterate lists in React?
 a) map () b) for () c) forEach () d) for…of()

12) iterate following list
 const [arr1, setArr1] =useState ([10,20,30,40,50]);
 Ans:

13) how to track elements in list ______________

14) iterate following list
 const [arr2, setArr2] =useState ([“React”,” Angular”,” VueJS”,” MongoDB”,” NodeJS”]);
Ans:

15) Read Data from following JSON Object
const [obj, setObj] =useState ({frontend:’React’, backend:’Boot’, database:’MongoDB’});
Ans:

16) Calculate the TA, DA, HRA and PF on Salary
TA --- 7% DA --- 9% HRA --- 12% PF --- 15%
const [salary, setSalary] =useState (30000);
Ans:

17) Identify Expression/Interpolation in React
a) {} b) [] c) both a & b d) None

18) how to change state in **Class Level Components** ________________

19) display following data in the form of a table
const [products, setProducts] =useState ([
{p_id:111, p_name: ’p_one’, p_cost:10000},
{p_id:222, p_name:’p_two’, p_cost:20000},
{p_id:333,p_name:’p_three’,p_cost:30000},
{p_id:444,p_name:’p_four’,p_cost:40000},
{p_id:555,p_name:’p_five’,p_cost:50000}]);

20) const [x, setX] =useState (100);
<h1>{x}</h1> Ans _________________
setX (200);
<h1>{x}</h1> Ans _________________

PRACTICE PAPER-3

1) How Child Component Receives data from Parent Component ____________
2) are Props Immutable? _______________
3) write the Differences Between State and Props?

4) pass following data from Parent Component to Child Component
    a) welcome to reactjs
    b) 1000
    c) true
    d) [100,200,300,400,500]
    e) {key1:’Hello’, key2:’Welcome’, key3:’ReactJS’}
    f) [{p_name: ’laptop’, p_cost:50000, p_image:’laptop.png’},
       {p_name:’watch’,p_cost:20000, p_image:’watch.png’},
      {p_name:’mobile’,p_cost:10000,p_image:’mobile.png’}
     ]

PRACTICE PAPER-4

1) React follows which DOM ________________________
2) In react only changed element will reload/refresh? ____________
3) What is Single Page Application?
   Ans:

4) what is Routing?
Ans

5) how to implement Routing in single page applications?
   a) Route b) Routes c) both a&b d) None
6) how to encapsulate child Routings in single page applications?
   a) Route b) Routes c) both a&b d) None
7) how to handle Dynamic Routing in single page applications_____________
8) how to handle Static Routing in single page applications_____________
9) how to read routing parameters in single page applications?
   a) useNavigate () b) useParams ()
   c) both a & b d) None
10) wildcard routing starts with _________________
11) default routing starts with __________________
12) how to hold child components in single page applications?
   a) <Outlet></Outlet> b) <Route></Route>
   c) <Routes></Routes> d) None
13) Draw the Diagram Representing Single Page Applications?

14) which package required to implement single page applications?

PRACTICE PAPER-5

1) How to implement State Management in ReactJS?
   a) Context API b) Redux c) both a&b d) None
2) is context API inbuilt API (yes/no) ______________
3) is Redux inbuilt API (yes/no) ________________
4) Identify 3rd party library?
   a) Context API b) Redux c) Both a&b d) None
5) Which Hook used to create Context in Context API ___________________
6) Which Hook used to consume Context in Context API_________________
7) What is provider in Context API?
   Ans:
8) What is consumer in Context API?
   Ans:
9) Is Context API suitable for Static Data ________________
10) which State Management Technique Recommended for Small Scale Web Application_______________________
11) Draw the Context API State Management Diagrammatic Representation

PRACTICE PAPER-6

1) Redux library suitable for _________________
   a) small scale web applications b) medium scale web applications
   c) large scale web applications d) both b & c
2) What is the name of the global object which is used to manage the application state in Redux?
   a) Store b) File c) Directory d) None of these
3) The states and actions are held together in Redux using?
   a) View b) Subscribe c) Reducer d) None of these
4) The following can be used to retrieve updated state in Redux and render it again
   a) Store b) Reducer c) Action d) View
5) The number of arguments which the createStore function can have been: _____________
6) Which of the following makes stores available in Redux?
   a) Views b) Containers c) Providers d) Actions
7) The type of data flow followed in Redux is? _________________
8) What is used to notify the view by executing their callback functions?
   a) Store b) Reducer c) Action d) State
9) In order to retrieve the current state of our Redux store, we can user the following function
   a) content b) action c) dispatch d) getState
10) Which of the following is a core principle of Redux?
   a) Single source of truth b) The state is read only
   c) Changes are made with pure functions d) All of the above
11) In order to dispatch an action to change a state in our application, we can use the following method:
   a) getState b) setState c) subscribe d) dispatch
12) can we create more than one reducer (yes/no) ___________________
13) can we create more than one store (yes / no) ____________________
14) why middleware's in redux?
   Ans:

15) identify the middleware's in redux?
   a) thunk b) saga c) both a&b d) None
16) Explain Actions in Redux?
   Ans:

17) Explain Action Creators in Redux?
Ans:

18) Explain Reducer in Redux?
Ans:

19) Explain Store in Redux?
Ans:

20) write the principles of redux?

21) what is dispatch in Redux?

22) what is Subscribe in Redux?

23) what are constants in Redux?

24) draw the Architectural Diagram of Redux?

25) write Few points related to thunk middleware?

26) draw the Architectural diagram of thunk middleware?

27) how to interact with external resources asynchronously?
   a) thunk b) saga c) both a&b d) None

28) write few points related to saga middleware?

29) draw the architectural diagram of saga middleware

30) explain redux toolkit?

31) explain redux devtool?

33) write the libraries required to build redux application?

34) which library used to connect redux to react ___________________

35) write the Differences between context API and Redux?

36) what is Flux? And draw the Architectural Diagram of Flux

37) write the Differences between Flux and Redux?

38) write the Differences between thunk and saga?

39) is redux can integrate with other frameworks (yes/no) __________

40) write the command to download following libraries?
redux-thunk
redux-saga
react-redux

Ans:

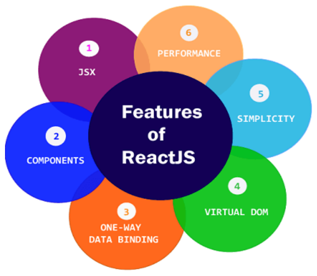
FAQ'S

1) What is React?

- ✓ ReactJS is **JavaScript library**
- ✓ ReactJS used to develop **web applications**
- ✓ ReactJS Released by **Facebook**
- ✓ We will develop ReactJS Applications in **two** ways
  1) JSX
  2) TSX
- ✓ Current version is **ReactJS 18.X**

2) What are the features of ReactJS?

- ✓ JSX
- ✓ Components
- ✓ Virtual DOM
- ✓ One way data binding
- ✓ Simplicity
- ✓ Performance



3) What the limitations of ReactJS?

- ✓ ReactJS is just a library not like Framework
- ✓ JSX takes time to understand
- ✓ Syntax are not user friendly

4) Explain JSX?

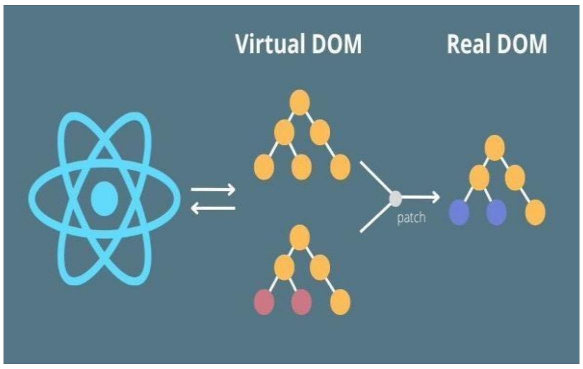
- ✓ JSX Stands for **JavaScript XML**
- ✓ JSX allows us to write **HTML** directly within the **JavaScript code**
- ✓ JSX used to implement **React Applications**
- ✓ JSX is an extension of the **JavaScript language**
- ✓ **Babel** will convert **JSX Expressions/Syntax** to Actual **JavaScript Code**
- ✓ **Performance** Increases with **JSX**

5) What is Babel?

- ✓ **Babel** is the **JavaScript Compiler**
- ✓ **Babel** will convert modern JavaScript (Latest Code) into a version **compatible with all browsers**
  (Latest Code to Old Version Code)
- ✓ **Browsers** can't understand **JSX** will understand only **JavaScript**
- ✓ **Babel** will convert **JSX Syntax/Expression** to **JavaScript**

6) Explain Virtual DOM?

- ✓ A virtual DOM is a lightweight JavaScript
- ✓ Updating the virtual DOM is comparatively faster than updating the actual DOM
- ✓ In Virtual DOM, only Changed Element will Reload Instead of All Elements
- ✓ Because of Virtual DOM Application Performance Increases



7) Differences Between Angular and ReactJS?

Angular	React
Released by Google	Released by Facebook
We will use TypeScript	We will use JSX
Open-Source JavaScript framework	Open-Source JavaScript library
Two-way data binding	One way data binding
Regular DOM	Virtual DOM
Supports MVC	Supports Flux
Performance is Slow	Performance is High because of Virtual DOM
Supports unit and integration testing	Supports only unit testing

8) Differences Between Real DOM and Virtual DOM?

Real DOM	Virtual DOM
In Real DOM Updates are slower	In Virtual DOM updates are faster
Real DOM updates the HTML Directly	Virtual DOM can't update HTML Directly
DOM Manipulations are Expensive	DOM Manipulations are Easy
Memory wastage in Real DOM	There is no Memory wastage in Virtual DOM

9) Explain render ()?

- ✓ render () hook used to write the presentation logic (HTML Code) in class level components
- ✓ render () hook is mandatory hook
- ✓ when ever state changes automatically render () hook will execute

10) Differences Between State and Props?

State	**Props**
State Contains Component Data	Child Component Receives Data from Parent Component
State is Mutable	Props are Immutable

11) Explain setState () in ReactJS?

- ✓ **setState ()** is the predefined method used to **change/update** the state of Component (**Class Level Components / Stateful Components**)

12) Differences Between Class Level Components and Functional Components?

Functional Components	**Class Components**
1) We **can't create object** to functional components	We **can create object** to class components
2) These components are also called as **temporary components**	These components are existed at the **end of process** **(Container Components)**
3) These components are called as **stateless components**	These components are called as **stateful components**
4) Supports **Hooks**	Supports **life cycle methods**
5) We can't **reuse** stateless components	We can reuse **stateful** components
6) These components are **easy** to understand	These components are **difficult** to understand
7) We will write html in **return method**	We will write html in **render () hook**

13) Explain lists in ReactJS?

- ✓ Lists are used to display data in ordered format
- ✓ map () method used to iterate lists in ReactJS

14) what are keys in ReactJS lists?

- ✓ key is a unique identifier
- ✓ key is used to identify which items changed/updates/deleted from list
- ✓ in react only changed element will reload instead of all elements in lists
- ✓ Application performance will increase

13) What is Redux?

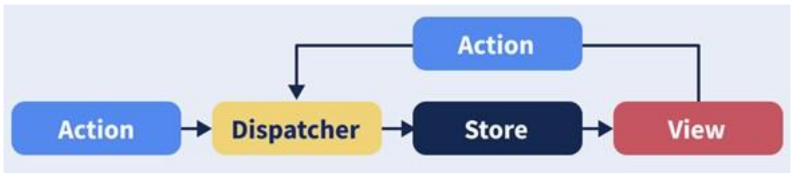
- ✓ Redux is 3rd party library
- ✓ Redux overcomes props drilling
- ✓ Redux used to maintain state of react applications
- ✓ Redux reduces burden on server
- ✓ Redux we can integrate to Angular, VueJS, Vanila's, ...
- ✓ Redux library size is around 2kb

14) Explain Flux?

- ✓ Flux is an application paradigm (Pattern)
- ✓ Flux behaves live MVC (Model-View-Controller)
- ✓ Flux Direction is Unidirectional
- ✓ Flux also used to maintain the state

  Components of Flux

  1. View
  2. Action
  3. Dispatcher
  4. Store



15) Differences between Redux and Flux?

	Redux	Flux
number of stores	One	More
Architecture	build user interfaces	build web applications (Client server architecture)
business logic	resides on reducer	resides on store

16) Write the core principles of Redux?

- ✓ only one Application State
- ✓ State is read-only (changes are done through actions)
- ✓ Changes are made with pure functions

17) Advantages of Redux?

- ✓ Redux is used to overcome to props drilling
- ✓ Redux applications are suitable for medium and large-scale web applications
- ✓ Redux suitable for Dynamic Data (Frequently Updating)

- ✓ Debugging Easy
- ✓ Maintains only one Application State
- ✓ Performance is high
- ✓ Flexible
- ✓ Centralized
- ✓ Predictable

18) Explain Redux Toolkit?

- ✓ Redux Toolkit provides Boilerplate snippets
- ✓ Redux Toolkit saving developers "development time"
- ✓ Building Redux applications with Redux Toolkit is Easy

19) Explain Redux DevTools?

- ✓ with the help of Redux DevTools, application debugging is Easy
- ✓ with the help of Redux DevTools, we can inspect state
  1) previous state
  2) new state
- ✓ with the help of Redux DevTools we can inspect Actions

20) what are the differences between mapStateToProps () and mapDispatchToProps ()?

<u>mapStateToProps ()</u>

- ✓ mapStateToProps () used to perform subscription in Redux architecture

<u>mapDispatchToProps ()</u>

- ✓ mapDispatchToProps () used to perform dispatch operation in Redux architecture

21) Explain Action in Redux?

- ✓ source of information to store called as Action
- ✓ Action is plain JavaScript object/JSON Object

  Ex.

```
let actionObj = {
        type: "ADD",
        payload: 10
};
```

10) Explain Constants in Redux Architecture?

- ✓ we can overcome grammatical mistakes while developing Redux Applications
- ✓ we can maintain all constants in single file
- ✓ we can import these constants to actions, reducers, ……

11) what are reducers?

- ✓ in reducers we will write "business logic"
- ✓ we will create "more" than one reducer

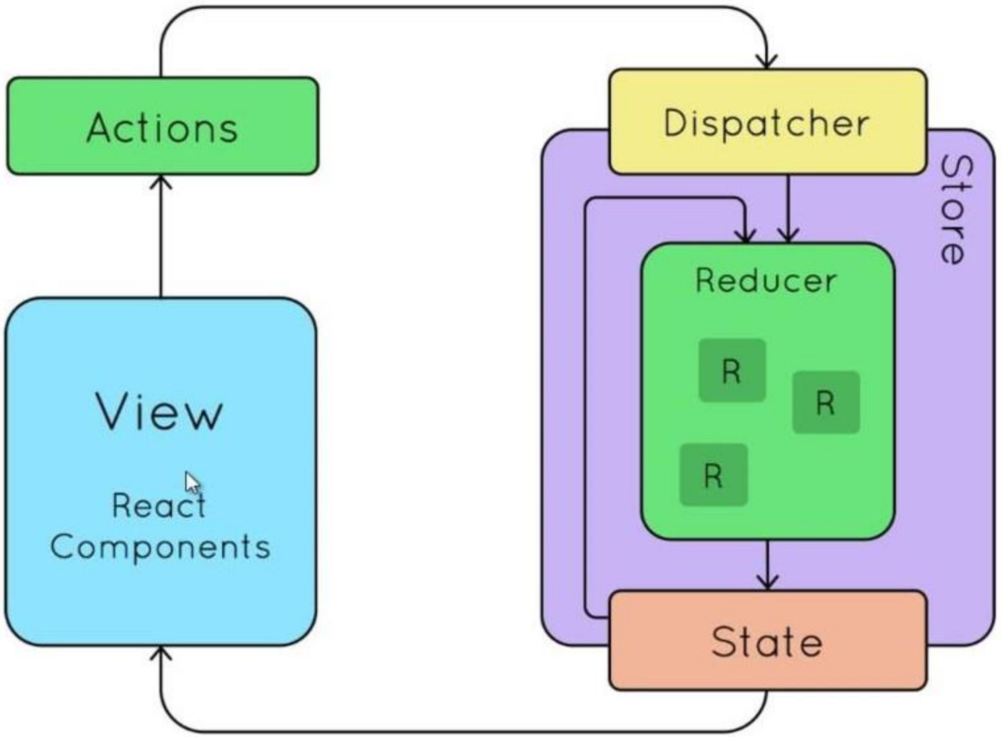
- ✓ application "readability" and "modularity" increases because of "Multiple reducers"
- ✓ reducers take the "action" and "previousState" as input and return "newState" as output

Ex.

```
function reducer (state, action) {
        ---
        ---
      return newState;
}
```

12) Explain Redux Life Cycle?

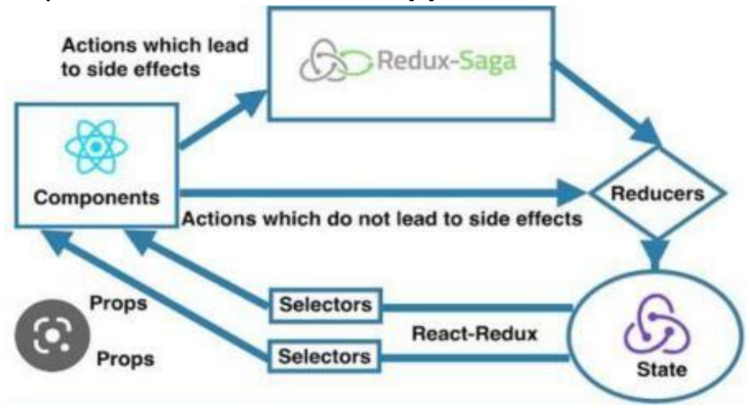
- ✓ Components Sending Actions to Store (dispatch)
- ✓ Reducer Receives the Action and Previous State from Store
- ✓ Reducer Generates newState
- ✓ Reducer will send newState to Component through Store



13) Explain Redux Saga?

- ✓ Redux Saga is the Middleware
- ✓ Redux Saga used to connect to external resources Asynchronously
  Ex.
  Making http calls
  Reading browser storages
  Perform I/O operations
- ✓ Above Operations called as Side Effects

- ✓ Through **Redux Saga with Actions,** we can perform started, paused and aborted operations from **Redux Applications**


Actions which lead to side effects
Redux-Saga
Components
Actions which do not lead to side effects
Reducers
Props
Props
Selectors
Selectors
React-Redux
State

14) Explain Store in Redux?

- ✓ We can have only one **Store** in **Redux Application**
- ✓ Store contains **Application State (only one Application State)**
- ✓ Store Accommodates Reducer
- ✓ Store provides the following methods
  1. dispatch
  2. getState
  3. subscribe
  4. replaceReducer

15) Explain InitialState in Redux?

Ex.

```
function reducer (state=10, action) {

        return newState;
}
```

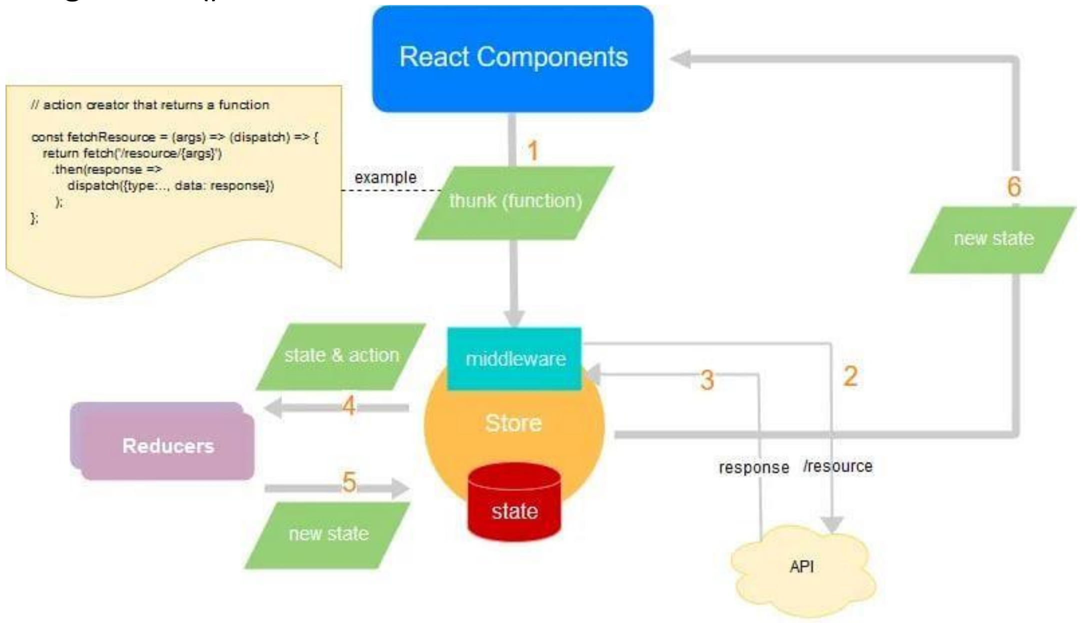
In above reducer function, state initialized with default value as **“10”**
Above value called as **initialState (10)**

16) Explain **Redux Thunk**?

- ✓ Thunk is Middleware
- ✓ Thunk Middleware used to delay calculations and evaluation of any operations in Redux Architecture
- ✓ Action Creator will return a function instead of object
- ✓ Returned function will receive two methods from store

  3) dispatch
  4) getState

- ✓ dispatch method used to make synchronous operation after successful completion of asynchronous operations
- ✓ getState () method used to access the state from store



```
// action creator that returns a function

const fetchResource = (args) => (dispatch) => {
  return fetch('/resource/{args}')
    .then(response =>
      dispatch({type:..., data: response})
    );
};
```

17) Explain Workflow Features of Redux?

1) Reset
   - ✓ we can reset application state

2) Revert
   - ✓ we can perform **undo** operation on application state changes

3) Sweep
   - ✓ we can remove **unexpected** fire of **disabled action**

4) Commit
   - ✓ we can initialize state with **default value**

18) Explain subscribe in Redux

- ✓ receiving new state from store called as **subscribe**

19) Explain dispatch in Redux

- ✓ sending actions to store called as **dispatch**