**Class 41: REACT (JSX & Props)**

**REACT Introduction**

React is a **JavaSript** library for building the **user interfaces**. It is maintained by Facebook, Instagram and a community of individual developers and corporations. It aims primarily to provide speed, simplicity, and scalability. React was created by **Jordan Walke**, a software engineer at **Facebook**. It was first deployed on Facebook’s newsfeed in 2011 and later on Instagram in 2012. It was open sourced at JSConf US in May 2013.

**Three Important Features**

**Component-based**

Build encapsulated components that manage their own state, then compose them to make complex UIs. Since component logic is written in JavaScript instead of templates, you can easily pass rich data through your app and keep state out of DOM.

**Declarative**

REACT makes it painless to create interactive UIs. Design simple views for each state in your application. REACT will efficiently update and render the right components when your data changes. Declarative views make your code more predictable and easier to debug.

**Learn Once, Write anywhere**

We don’t make assumptions about the rest of your technology stack, so you can develop new features in REACT without re-writing existing code. REACT can also render on the server using Node and power mobile apps using REACT Native.

**JSX www.babeljs.io**

JSX is a syntax extension to JavaScript. We recommend using it with REACT to describe what the UI should look like. JSX may remind you of a template language but it comes with the full power of JavaScript.

JSX produces REACT “elements”. To render this react element:

ReactDOM.render(element, document.getElementById(‘root’));

JSX Represents Objects

Two identical examples:

Constant element = <h1 className=”greeting”>Hello, world!</h1>;

Const element = React.createElement(

‘h1’,

{className: ‘greeting’},

‘Hello, world!’

);

React

**Embedded Expression in JSX**

**JSX is an expression too**

**Inline Style**

**Component & Props**

**Component** let you split the UI into independent, reusable pieces, and think about each piece in isolation. Conceptually, components are like JavaScript **functions**. They accept arbitrary **inputs**(called “**props**”) and return react elements.

**Component props are read only**

LOOP Generation:

Conditional Rendering:

Rendering the

REACT only updates what’s necessary

**Visual DOM**:

DOM stands for document object model, which is an abstraction of a structured text. For web developers, this text is HTML. Elements of HTML becomes nodes in the DOM.

The HTML DOM provides an interface (API) to traverse and modify the nodes. It contains methods like **getElementsById, .innerHTML and createElement**.

Visual DOM: when a change occurs, a new virtual DOM is created from scratch. That new virtual DOM will reflect the new state of the data model. REACT has two virtual DOM data management: the old one and the new one. It then runs a diffing algorithm on two virtual DOMs, to get the set of changes between them. Those changes are applied to the real DOM. Every node in React’s virtual DOM tree is a ReactElement.

**Home Work**: Extracting Components

**Class 44: REACT (State & Event)**

**Convert a function** **to a class**: 5 steps (44-2, 3:40)

**Adding local state to a class:**

Add a class constructor that assign

Note how we pass props to the

**Add lifecycle methods** to a class: in applications with many components, it is very important to free up resources taken by the components when they are destroyed.

**Using State Correctly**

**DO not modify state directly**: never mutate this.state directly, as calling setState() afterwards may replace the mutation you made.

The only place you can assign this.state is the **constructor.**

**State Updates may be asynchronous**

React may batch multiple setState() calls into a single update for performance. Because this.props and this.state may be updated asynchronously, you should not rely on their values for calculating the next state.

**Class 45: REACT (practices, TODO APP)**

**Data Communication between components**

**Data flows down (1:02:11)**

Neither parent nor child components can know if a certain component is stateful or stateless. They should not care whether it is defined as a function or a class. This is why state is often called local or encapsulated. It is not possible to any component other than the one that owns or sells it. A component may choose to pass its state down as props to its child components.

**Lift state up**

Once the state is changed by the setState, component and its children’s virtual DOM will be re-rendered.

Often, several components need to reflect the same changing data. We recommend lifting the shared state up to their **lowest common ancestor**.

There should be a single “source of truth” for any data that changes in a REACT application. Usually, the state is first added to the component that needs it for rendering. Then, if other components also need it, you can lift it up to their lowest common ancestor. Instead of trying to sync the state between different components, you should rely on the top-down data flow.

Callback climbs up

**Class 48: REACT: component life cycle**

**Overview**

React provides a series of hooks we can tap into at each phase of the life cycle. The methods hooks inform us of where the component is in the life cycle.

Each of the life cycle methods are called in a specific order and time. The methods are also tied to different parts of the life cycle. Here are the methods broken down in order and by their corresponding

Mounting

Update

Unmount

Mounting in action

Default props & initial state

Mounting methods

Mounting a tree of components

Updating in action

**Class 51: REACT (Refs, Module, project setup)**

**Refs**

In the typical React data flow, props are the only way that parent components interact with their children. To modify a child, you re-render it with new props. However, there are a few cases where you need to imperatively modify a child outside of the typical dataflow. The child to be modified could be an instance of a react component, or it could be a DOM element. For both of these cases, REACT provides refs as an escape hatch.

When to use?

* Managing focus, text selection, or media playback.
* Triggering imperative animations.
* Integrating with 3rd party DOM libraries.

Adding a ref to a DOM element

**New API: Function Refs**

The Ref attribute can take a **callback function** as well, and the **callback will be executed immediately after the component is mounted or unmounted.**

When the ref attribute is used on an **HTML element**, the ref callback receives the underlying **DOM element** as its argument.

**Refs and functional components**:

you may NOT use the ref attribute on the functional components because they do not have instances.

You should convert the component to a class if you need a ref to it, the same as when you need life cycle methods or state. You can, however, use the ref attribute inside a functional component as long as you refer to a DOM element.

**Modules**

Language level support for modules for component definition. Codifies pattern from popular JavaScript module loader(AMD, CommonJS). Runtime behavior defined by a host-defined default loader. Implicitly async model – no code executes until requested modules are available and processed.

**Project: Intellij, Node.js, NPM**

**Create REACT app:**

Npm install -g create-react-app

//permission issue?

Sudo npm install -g create-react-app

//cd to the parent folder of your project

Create-react-app around-web

Cd around-web/

Npm start

**Class 52: REACT (Around project)**

How to start?

IDE: cd around-web; npm start;

**Ant design**: is a component library

frontEnd function:

register ID,

Login ID