

Web dev

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目录

1 Caveats

2 Git

2.1	Basic Git Workflow	
2.2	How to Backtrack in Git	
2.2.1	head commit	
2.2.2	git checkout	
2.2.3	git reset I	
2.2.4	git reset II	
2.3	Git Branching	
2.3.1	git merge	
2.3.2	delete branch	
2.3.3	Conclusion	
2.4	Git Teamwork	
2.4.1	git clone	
2.4.2	git remote -v	
2.4.3	git fetch	
2.4.4	git merge	
2.4.5	git push	
2.5	create-react-app and git	

3 VSCode

4 React

4.1	创建React项目 Add React to a New Application
4.2	JSX
4.2.1	JSX caveats
4.2.2	JSX conditionals
4.2.3	.map in JSX
4.2.4	Keys in JSX
4.3	The component
4.4	Components and advanced JSX
4.4.1	Put Logic in a Render Function
4.4.2	Use this in a Component
4.4.3	Use an Event Listener in a Component
4.5	Components render other components
4.5.1	A Component in a Render Function
4.6	this.props
4.6.1	Access a Component's props
4.6.2	Pass 'props' to a Component
4.6.3	Render a Component's props
4.6.4	Pass props From Component To Component
4.6.5	Receive an Event Handler as a prop
4.6.6	this.props.children
4.6.7	defaultProps
4.7	this.state
4.7.1	Setting Initial State
4.7.2	Update state with this.setState
4.7.3	Call this.setState from Another Function
4.8	Child Components Update Their Parents' state
4.9	Child Components Update Their Siblings' props
4.10	A controlled component example
4.11	Advanced React Techniques
4.11.1	React styles
4.11.2	Another React pattern
4.11.3	propTypes

4.11.4	PropTypes in Stateless Functional Components	...
4.11.5	React forms	...
4.12	Lifecycle Methods	...
4.12.1	Mounting lifecycle methods	...
4.12.2	Updating/unmounting lifecycle methods	...
5	wechat mini program	
5.1	框架	...
6	JavaScript	
6.1	class	...
6.2	Request	...
7	CSS	
7.1	Media Queries	...
7.2	CSS Display and Positioning	...
7.3	The box model	...
7.4	Non-Inherited properties	...
7.5	Learn Responsive Design	...
7.5.1	Percentages: Padding & Margin	...
7.6	display property	...
7.7	Grid layout	...
7.8	p tag	...
8	npm	
9	DOM	
10	中文笔记	
11	Abbr	
1	Caveats	

1. Chrome developer tools: open the **Elements** tab to inspect the compiled html
2. `import` vs `require`: `import` can bring in only the desired function

```
import {countItems} from ‘‘math_array_functions’’
```

3. `<meta name="viewport" content="width= device-width, initial-scale= 1">`

4. FTP is the primary method by which people upload files to web servers. However, services like GoDaddy and others often try to provide simpler ways to upload files.

5. There is a space between `body` and `asterisk`

```
body, body *{  
    margin: unset;  
    padding: unset;  
}
```

6. Sometimes you have to close the page and then reload from webstorm to make the change take place

2 Git

2.1 Basic Git Workflow

`git init`

`git status` inspects the contents of the working directory and staging area

`git add filename_1 filename_2` add files/changes to the staging area. `git add .`

or `git add -A` shortcut for adding all the files to the staging area

`git diff filename` press `q` on your keyboard to exit diff mode. If no content has been changed then nothing will appear. Diff between *add* and changes after *add*

`git commit -m "Complete first line of dialogue"` Standard Conventions for Commit Messages:

- Must be in quotation marks
- Written in the present tense
- Should be brief (50 characters or less) when using `-m`

`git log` Commits are stored chronologically in the repository and can be viewed using this command

2.2 How to Backtrack in Git

2.2.1 head commit

In Git, the commit you are currently on is known as the HEAD commit. In many cases, the most recently made commit is the HEAD commit

To see the HEAD commit, enter: `git show HEAD`

The output of this command will display everything the `git log` command displays for the HEAD commit, plus all the file changes that were committed

2.2.2 git checkout

What if you decide to change the ghost's line in the working directory, but then decide you wanted to discard that change?

`git checkout HEAD filename` or `git checkout -- filename` will restore the file in your working directory to look exactly as it did when you last made a commit

Here, `filename` again is the actual name of the file. If the file is named `changes.txt`, the command would be

```
git checkout HEAD changes.txt
```

2.2.3 git reset I

What if, before you commit, you accidentally delete an important line from `scene-2.txt`? Unthinkingly, you add `scene-2.txt` to the staging area. The file change is unrelated to the Larry/Laertes swap and you don't want to include it in the commit

We can unstage that file from the staging area using `git reset HEAD filename`

2.2.4 git reset II

Git enables you to rewind to the part before you made the wrong turn. You can do this with:

```
git reset commit_SHA
```

This command works by using the first 7 characters of the SHA of a previous commit. For example, if the SHA of the previous commit is

5d692065cf51a2f50ea8e7b19b5a7ae512f633ba, use:

```
git reset 5d69206
```

HEAD is now set to that previous commit

Before reset: HEAD is at the most recent commit

After resetting: HEAD goes to a previously made commit of your choice. You have in essence rewound the project's history

Then you may want to discard all the changes in that commit with

```
git checkout HEAD filename
```

2.3 Git Branching

Up to this point, you've worked in a single Git branch called **master**. Git allows us to create branches to experiment with versions of a project. Imagine you want to create version of a story with a happy ending. You can create a new branch and make the happy ending changes to that branch only. It will have no effect on the **master** branch until you're ready to merge the happy ending to the master branch

- You can use following command to answer the question: “which branch am I on?” `git branch`
- To create a new branch, use: `git branch new_branch`. Also, branch names can't contain whitespaces: `new-branch` and `new_branch` are valid branch names, but `new branch` is not
- You can switch to the new branch with: `git checkout branch_name` (notice the * is now over the new branch)
- Once you switch branch, you now able to make commits on the branch that have no impact on **master**

2.3.1 git merge

- Switch to master branch with `git checkout master`
- Merge new branch to master branch using `git merge new_branch`
- The merge is a "fast forward" because Git recognizes that **fencing** (created new branch) contains the most recent commit. Git fast forwards **master** to be up to date with **fencing**

2.3.2 delete branch

In Git, branches are usually a means to an end. You create them to work on a new project feature, but the end goal is to merge that feature into the master branch. After the branch has been integrated into master, it has served its purpose and can be deleted

The command `git branch -d branch_name` will delete the specified branch from your Git project. If some feature branches were never merged into `master`, then use the uppercase D, like `git branch -D branch_name`

2.3.3 Conclusion

- `git branch`: Lists all a Git project's branches
- `git branch branch_name`: Creates a new branch
- `git checkout branch_name`: Used to switch from one branch to another
- `git merge branch_name`: Used to join file changes from one branch to another
- `git branch -d branch_name`: Deletes the branch specified

2.4 Git Teamwork

2.4.1 git clone

```
git clone remote_location clone_name
```

- `remote_location` tells Git where to go to find the remote. This could be a web address, or a filepath
- `clone_name` is the name you give to the directory in which Git will clone the repository

For example, you're collaborating with Sally, the Git remote Sally started is called: `science-quizzes`

```
git clone science-quizzes my-quizzes
```

`my-quizzes` is your local copy of the `science-quizzes` Git project. If you commit changes to the project here, Sally will not know about them

2.4.2 git remote -v

Nice work! We have a clone of Sally's remote on our computer. One thing that Git does behind the scenes when you clone `science-quizzes` is give the remote address the name `origin`, so that you can refer to it more conveniently. In this case, Sally's remote is `origin`.

You can see a list of a Git project's remotes with the command: `git remote -v`. The remote is listed twice: once for (`fetch`) and once for (`push`). We'll learn about these later in the lesson

2.4.3 git fetch

An easy way to see if changes have been made to the remote and bring the changes down to your local copy is with:

```
git fetch
```

This command will not *merge* changes from the remote into your local repository. It brings those changes onto what's called a *remote branch*. Learn more about how this works below

2.4.4 git merge

Even though Sally's new commits have been fetched to your local copy of the Git project, those commits are on the `origin/master` branch. Your *local master* branch has not been updated yet, so you can't view or make changes to any of the work she has added

In *Lesson III, Git Branching* we learned how to merge branches. Now we'll use the `git merge` command to integrate `origin/master` into your local `master` branch. The command:

```
git merge origin/master
```

 will accomplish this for us

2.4.5 git push

Now it's time to share our work with Sally.

```
git push origin your_branch_name
```

will push your branch up to the remote, `origin`. From there, Sally can review your branch and merge your work into the master branch, making it part of the definitive project version.

2.5 create-react-app and git

1. create-react-app myapp will initialize a git repository
2. create a new repository on github, then push existing repository from command line using following commands

```
git remote add origin https://github.com/Jiapan-Yu/newTest.git  
git push -u origin master
```
3. then create a new branch with `git branch dev` and switch to that branch
`git checkout dev`

3 VSCode

- type tab key twice to autocomplete

4 React

4.1 创建React项目 **Add React to a New Application**

1. `npm install -g create-react-app`
2. `create-react-app myapp`
3. `cd myapp`
4. `npm start`
5. When you're ready to deploy to production, running `npm run build` will create an optimized build of your app in the `build` folder

```
import React from 'react';  
import ReactDOM from 'react-dom';  
  
class App extends React.Component {  
  render() {  
    return (<h1>React setup</h1>);  
  }  
}
```

```
ReactDOM.render(
  <App />,
  document.getElementById('root')
);
```

6. 默认所有配置是隐藏起来的，要想自定义配置，需要运行一个命令：`npm run eject`。接着package.json里面的scripts键会变为node。`npm start` 运行正常

7. install `less` and `mini-css-extract-plugin` to use less and extract css into one file, configured `webpack.config.dev.js`. Add following lines in the correct places

```
const MiniCssExtractPlugin = require("mini-css-extract-plugin");

,
// adds support for css and less
{
  test: /\.css$/, /* need this less */
  use: [
    MiniCssExtractPlugin.loader,
    "css-loader",
    "less-loader" /* need this line */
  ]
}

new MiniCssExtractPlugin({
  // Options similar to the same options in webpackOptions.output
  // both options are optional
  filename: "[name].css",
  chunkFilename: "[id].css"
}),
```

4.2 JSX

1. Event Listeners in JSX

```
<img onClick={myFunc} />
```

An event listener attribute's name should be something like `onClick` or `onMouseOver`: the word `on`, plus the type of event that you're listening for. [Supported Events](#)

Note that in HTML, event listener names are written in all lowercase, such as `onclick` or `onmouseover`. In JSX, event listener names are written in camelCase, such as `onClick` or `onMouseOver`

2. Variable Attributes in JSX

```
// Use a variable to set the 'height' and 'width' attributes:
```

```
const sideLength = "200px";
```

```
const panda = (  
    
);
```

3. Everything inside of the curly braces will be treated as regular JavaScript

```
ReactDOM.render(  
  <h1>{2 + 3}</h1>,  
  document.getElementById('app')  
);
```

The result is 5

4. ReactDOM.render() is the most common way to render JSX:

```
ReactDOM.render(<h1>Hello world</h1>, document.getElementById('app'));
```

5. There's a rule that we haven't mentioned: a JSX expression must have exactly one outermost element.

6. If a JSX expression takes up more than one line, then you must wrap the multi-line JSX expression in parentheses. This looks strange at first, but you get used to it:

```
const theExample = (  
  <a href="https://www.example.com">  
    <h1>  
      Click me!  
    </h1>  
  </a>  
)
```

7. JSX elements are treated as JavaScript expressions. They can go anywhere that JavaScript expressions can go.

That means that a JSX element can be saved in a variable, passed to a function, stored in an object or array...you name it

8. JSX is a syntax extension for JavaScript. It was written to be used with React. JSX code looks a lot like HTML

4.2.1 JSX caveats

1. You can not inject an if statement into a JSX expression.

This code will break:

```
(  
  <h1>  
    {  
      if (purchase.complete) {  
        'Thank you for placing an order!'  
      }  
    }  
  </h1>  
)
```

2. In JSX, self-closing tags have to include the slash, otherwise it will raise an error

3. In JSX, you can't use the word `class`! You have to use `className` instead:

```
<h1 className="big">Hey</h1>
```

This is because JSX gets translated into JavaScript, and `class` is a reserved word in JavaScript

4.2.2 JSX conditionals

1. The Ternary Operator

```
const headline = (  
  <h1>  
    { age >= drinkingAge ? 'Buy Drink' : 'Do Teen Stuff' }  
  </h1>  
);
```

2. `&&`

```
const tasty = (  
  <ul>  
    <li>Applesauce</li>  
    { !baby && <li>Pizza</li> }  
    { age > 15 && <li>Brussels Sprouts</li> }  
    { age > 20 && <li>Oysters</li> }  
    { age > 25 && <li>Grappa</li> }  
  </ul>  
);
```

4.2.3 `.map` in JSX

If you want to create a list of JSX elements, then `.map()` is often your best bet. It can look odd at first:

```
const strings = ['Home', 'Shop', 'About Me'];  
  
const listItems = strings.map(string => <li>{string}</li>);  
  
<ul>{listItems}</ul>
```

4.2.4 Keys in JSX

A key is a JSX attribute. The attribute's name is **key**. The attribute's value should be something unique, similar to an **id** attribute

```
const people = ['Rowe', 'Prevost', 'Gare'];

const peopleLis = people.map((person, i) =>
  // expression goes here:
  <li key={'person_' + i}>{person}</li>
);
```

4.3 The component

1. React applications are made out of *components*. A component is a small, reusable chunk of code that is responsible for one job. That job is often to render some HTML.

```
import React from 'react';
import ReactDOM from 'react-dom';

class MyComponentClass extends React.Component {
  render() {
    return <h1>Hello world</h1>;
  }
};

ReactDOM.render(
  <MyComponentClass />,
  document.getElementById('app')
);
```

2. For now, just know that you get the React library via `import React from 'react';`
 3. To clarify: the DOM is *used* in React applications, but it isn't *part* of React
- ```
import ReactDOM from 'react-dom';
```

4. By subclassing `React.Component`, you create a new component class. This is not a component! A component class is more like a factory that produces components. When you start making components, each one will come from a component class
5. **The Render Function:** All you know so far is that its name is `render`, it needs a return statement for some reason, and you have to include it in the body of your component class declaration
6. **Create a Component Instance:**  
`<MyComponentClass />`
7. **Render A Component:** `<MyComponentClass />` will call its render method, which will return the JSX element `<h1>Hello world</h1>`. `ReactDOM.render()` will then take that resulting JSX element, and add it to the virtual DOM. This will make "Hello world" appear on the screen.

## 4.4 Components and advanced JSX

### 4.4.1 Put Logic in a Render Function

```
class Random extends React.Component {
 render() {
 const n = Math.floor(Math.random() * 10 + 1);
 return <h1>The number is {n}!</h1>;
 }
}
```

### 4.4.2 Use this in a Component

```
class IceCreamGuy extends React.Component {
 get food() {
 return 'ice cream';
 }

 render() {
 return <h1>I like {this.food}</h1>;
 }
}
```

#### 4.4.3 Use an Event Listener in a Component

```
render() {
 return (
 <div onMouse={myFunc}>
 </div>
);
}
```

Recall that an event handler is a function that gets called in response to an event. In the above example, the event handler is `myFunc()`.

In React, you define event handlers (functions) as methods on a component class. Like this:

```
class MyClass extends React.Component {
 myFunc() {
 alert('Stop it. Stop hovering.'); }

 render() {
 return (
 <div onMouse={this.myFunc}>
 </div>
);
 }
}
```

Almost all functions that you define in React will be defined in this way, as methods in a class

### 4.5 Components render other components

#### 4.5.1 A Component in a Render Function

1. When you use named exports, you always need to wrap your imported names in curly braces, such as:

```
import { faveManifestos, alsoRan } from './Manifestos';
```



2. To import a variable, you can use an `import` statement:

```
import { NavBar } from './NavBar.js';
```

you can omit the `.js` extension

3. Render methods can also return another kind of JSX: component instances

```
class OMG extends React.Component {
 render() {
 return <h1>Whooaa!</h1>;
 }
}
```

```
class Crazy extends React.Component {
 render() {
 return <OMG />;
 }
}
```

In the above example, `Crazy`'s render method **returns** an instance of the `OMG` component class. You could say that `Crazy` renders an `<OMG />`

## 4.6 `this.props`

Information that gets passed from one component to another is known as "props."

### 4.6.1 Access a Component's props

To see a component's props object, you use the expression `this.props`

```
class PropsDisplayer extends React.Component {
 render() {
 const stringProps = JSON.stringify(this.props);

 return (
 <div>
 <h1>CHECK OUT MY PROPS OBJECT</h1>
 <h2>{stringProps}</h2>
)
);
 }
}
```

```

 </div>
);
}
}

```

```
ReactDOM.render(<PropsDisplayer />, document.getElementById('app'));
```

#### 4.6.2 Pass 'props' to a Component

If you want to pass information that isn't a string, then wrap that information in curly braces

```

<Greeting myInfo={["top", "secret", "lol"]} />
<Greeting name="Frarthur" town="Flundon" age={2} haunted={false} />

```

#### 4.6.3 Render a Component's props

```

class Greeting extends React.Component {
 render() {
 return <h1>Hi there, {this.props.firstName}!</h1>;
 }
}

```

```

ReactDOM.render(
 <Greeting firstName='Joshua' />,
 document.getElementById('app')
);

```

#### 4.6.4 Pass props From Component To Component

**A curmudgeonly clarification about grammar:** You may have noticed some loose usage of the words `prop` and `props`. `props` is the name of the object that stores passed-in information. `this.props` refers to that storage object. At the same time, each piece of passed-in information is called a `prop`. This means that `props` could refer to two pieces of passed-in information, or it could refer to the object that stores those pieces of information

**Greeting.js**

```
import React from 'react';

export class Greeting extends React.Component {
 render() {
 return <h1>Hi there, {this.props.name}!</h1>;
 }
}
```

## App.js

```
import React from 'react';
import ReactDOM from 'react-dom';
import {Greeting} from './Greeting';

class App extends React.Component {
 render() {
 return (
 <div>
 <h1>
 Hulloo and, "Welcome to The Newzz," "On Line!"
 </h1>
 <Greeting name="Joshua" />
 <article>
 Latest newzz: where is my phone?
 </article>
 </div>
);
 }
}

ReactDOM.render(
 <App />,
 document.getElementById('app')
);
```

#### 4.6.5 Receive an Event Handler as a prop

##### Button.js

```
import React from 'react';

export class Button extends React.Component {
 render() {
 return (
 <button onClick={this.props.onClick}>
 Click me!
 </button>
);
 }
}
```

##### Talker.js

```
import React from 'react';
import ReactDOM from 'react-dom';
import { Button } from './Button';

class Talker extends React.Component {
 handleClick() {
 let speech = '';
 for (let i = 0; i < 10000; i++) {
 speech += 'blah ';
 }
 alert(speech);
 }

 render() {
 return <Button onClick={this.handleClick} />;
 }
}
```

```
ReactDOM.render(
 <Talker />,
 document.getElementById('app')
);
```

Great! You just passed a function from `<Talker />` to `<Button />`. `<Talker />` is the *parent* component class.

**Name confusion demystify:** `<Button />` is not an HTML-like JSX element; it's a component instance. Names like `onClick` only create event listeners if they're used on HTML-like JSX elements. Otherwise, they're just ordinary prop names.

#### 4.6.6 `this.props.children`

```
import { LilButton } from './LilButton';

class BigButton extends React.Component {
 render() {
 console.log(this.props.children);
 return <button>Yo I am big</button>;
 }
}
```

```
// Example 1
<BigButton>
 I am a child of BigButton.
</BigButton>
```

```
// Example 2
<BigButton>
 <LilButton />
</BigButton>
```

```
// Example 3
<BigButton />
```

In Example 1, `<BigButton>`'s `this.props.children` would equal the text, "I am a child of BigButton."

In Example 2, `<BigButton>`'s `this.props.children` would equal a `<LilButton />` component.

In Example 3, `<BigButton>`'s `this.props.children` would equal `undefined`.

If a component has more than one child between its JSX tags, then `this.props.children` will return those children in an array. However, if a component has only one child, then `this.props.children` will return the single child, not wrapped in an array.

#### 4.6.7 defaultProps

```
class Button extends React.Component {
 render() {
 return (
 <button>
 {this.props.text}
 </button>
);
 }
}

// defaultProps goes here:
Button.defaultProps = { text: 'I am a button' };

ReactDOM.render(
 <Button />,
 document.getElementById('app')
);
```

#### 4.7 this.state

Dynamic information is information that can change. There are two ways for a component to get dynamic information: **props** and **state**. Besides **props** and **state**,

every value used in a component should always stay exactly the same

#### 4.7.1 Setting Initial State

To make a component have **state**, give the component a **state** property. This property should be declared inside of a constructor method, like this

```
class Example extends React.Component {
 constructor(props) {
 super(props);
 this.state = { mood: 'decent' };
 }

 render() {
 return <div></div>;
 }
}
```

`<Example />`

`this.state` should be equal to an object, like in the example above. This object represents the initial "state" of any component instance

#### 4.7.2 Update state with `this.setState`

`this.setState()` takes two arguments: an object that will update the component's state, and a callback. You basically never need the callback

#### 4.7.3 Call `this.setState` from Another Function

```
class Mood extends React.Component {
 constructor(props) {
 super(props);
 this.state = { mood: 'good' };
 this.toggleMood = this.toggleMood.bind(this);
 }
```

```

toggleMood() {
 const newMood = this.state.mood === 'good' ? 'bad' : 'good';
 this.setState({ mood: newMood });
}

render() {
 return (
 <div>
 <h1>I'm feeling {this.state.mood}!</h1>
 <button onClick={this.toggleMood}>
 Click Me
 </button>
 </div>
);
}
}

```

in React, whenever you define an event handler that uses `this`, you need to add `this.methodName = this.methodName.bind(this)` to your constructor function.

*Any time that you call `this.setState()`, `this.setState()` AUTOMATICALLY calls `.render()` as soon as the state has changed.*

Think of `this.setState()` as actually being two things: `this.setState()`, immediately followed by `.render()`

That is why you can't call `this.setState()` from inside of the `.render()` method! `this.setState()` *automatically* calls `.render()`. If `.render()` calls `this.setState()`, then an infinite loop is created

## 4.8 Child Components Update Their Parents' state

See javascript.pdf

## 4.9 Child Components Update Their Siblings' props

See codecademy, this pattern occurs in React all the time!



## 4.10 A controlled component example

```
class NameForm extends React.Component {
 constructor(props) {
 super(props);
 this.state = {value: ''};

 this.handleChange = this.handleChange.bind(this);
 this.handleSubmit = this.handleSubmit.bind(this);
 }

 handleChange(event) {
 this.setState({value: event.target.value});
 }

 handleSubmit(event) {
 alert('A name was submitted: ' + this.state.value);
 event.preventDefault();
 }

 render() {
 return (
 <form onSubmit={this.handleSubmit}>
 <label>
 Name:
 <input type="text" value={this.state.value} onChange={this.handleChange} />
 </label>
 <input type="submit" value="Submit" />
 </form>
);
 }
}

ReactDOM.render(
```

```
<NameForm />,
document.getElementById('root')
);
```

## 4.11 Advanced React Techniques

### 4.11.1 React styles

In regular JavaScript, style names are written in hyphenated-lowercase:

```
const styles = {
 'margin-top': "20px",
 'background-color': "green"
};
```

In React, those same names are instead written in camelCase:

```
const styles = {
 marginTop: 20,
 backgroundColor: "green"
};
```

This has zero effect on style property values, only on style property names.

In React, if you write a style value as a number, then the unit "px" is assumed

If you want to use units other than "px," you can use a string: { `fontSize: "2em"` }

### 4.11.2 Another React pattern

A presentational component will always get rendered by a container component

When you separate a container component from a presentational component, the *presentational* component will always end up like this: one `render()` function, and no other properties

```
import React from 'react';

export class GuineaPigs extends React.Component {
 render() {
 let src = this.props.src;
 return (
```

```

 <div>
 <h1>Cute Guinea Pigs</h1>

 </div>
);
}
}

```

If you have a component class with nothing but a render function, then you can rewrite that component class in a very different way. Instead of using `React.Component`, you can write it as JavaScript function! A component class written as a function is called a *stateless functional component*

See [javascript.pdf](#) for an example

#### 4.11.3 propTypes

```

import React from 'react';

export class MessageDisplay extends React.Component {
 render() {
 return <h1>{this.props.message}</h1>;
 }
}

// This propTypes object should have
// one property for each expected prop:
MessageDisplay.propTypes = {
 message: React.PropTypes.string
};

```

Notice that the value of `propTypes` is an object, not a function! Each property on the `propTypes` object is called a `propTypes`

```

Runner.propTypes = {
 message: React.PropTypes.string.isRequired,
 style: React.PropTypes.object.isRequired,

```

```
 isMetric: React.PropTypes.bool.isRequired,
 miles: React.PropTypes.number.isRequired,
 milesToKM: React.PropTypes.func.isRequired,
 races: React.PropTypes.array.isRequired
};
```

Runner has six propTypes! Look at each one. Note that `bool` and `func` are abbreviated, but all other datatypes are spelled normally.

#### 4.11.4 PropTypes in Stateless Functional Components

```
import React from 'react';

export const GuineaPigs = (props) => {
 let src = props.src;
 return (
 <div>
 <h1>Cute Guinea Pigs</h1>

 </div>
);
}
```

```
GuineaPigs.propTypes = {
 src: React.PropTypes.string.isRequired
};
```

#### 4.11.5 React forms

### 4.12 Lifecycle Methods

#### 4.12.1 Mounting lifecycle methods

```
componentWillMount(){} render(){} componentDidMount(){}
```

When a component renders for the first time, `componentWillMount` gets called right before `render`.

When a component renders for the first time, `componentDidMount` gets called right after the HTML from `render` has finished loading.

Mounting lifecycle events only execute the first time that a component renders.

If your React app uses AJAX to fetch initial data from an API, then `componentDidMount` is the place to make that AJAX call. More generally, `componentDidMount` is a good place to connect a React app to external applications, such as web APIs or JavaScript frameworks. `componentDidMount` is also the place to set timers using `setTimeout` or `setInterval`.

#### 4.12.2 Updating/unmounting lifecycle methods

There are five updating lifecycle methods:

- `componentWillReceiveProps`
- `shouldComponentUpdate`
- `componentWillUpdate`
- `render`
- `componentDidUpdate`

Whenever a component instance updates, it automatically calls all five of these methods, in order.

`componentWillUnmount` is the only unmounting lifecycle method.

`componentWillUnmount` gets called right before a component is removed from the DOM. If a component initiates any methods that require cleanup, then `componentWillUnmount` is where you should put that cleanup

## 5 wechat mini program

### 5.1 框架

1. 开发者需要做的只是将页面的数据、方法、生命周期函数注册到框架中
2. 框架的核心是一个响应的数据绑定系统
3. 整个小程序框架系统分为两部分：视图层（View）和逻辑层（App Service）

## 6 JavaScript

### 6.1 class

1. Although the subclass automatically inherits the parent methods, you need to use the **super** keyword to set the parent properties
2. static methods: The `.now()` method is static, so you can call it directly from the class, but not from an instance of the class

```
static generateName() {
 const names = ['Angel', 'Spike', 'Buffy', 'Willow', 'Tara'];
 const randomNumber = Math.floor(Math.random()*5);
 return names[randomNumber];
}
```

3. In a `constructor()`, you must always call the **super** method before you can use the **this** keyword — if you do not, JavaScript will throw a reference error, it is best practice to call `super` on the first line of subclass constructors
4. When multiple classes share properties or methods, they become candidates for *inheritance* — a tool developers use to decrease the amount of code they need to write
5. Notice, we also prepended our property names with underscores (`_name` and `_behavior`), which indicate these properties should not be accessed directly

### 6.2 Request

1. GET and POST requests can be created a variety of ways
2. Use AJAX to asynchronously request data from APIs. `fetch()` and `async/await` are new functionalities developed in ES6 (promises) and ES8 respectively
3. Promises are a new type of JavaScript object that represent data that will eventually be returned from a request

4. `fetch()` is a web API that can be used to create requests. `fetch()` will return promises
5. We can chain `.then()` methods to handle promises returned by `fetch()`
6. The `.json()` method converts a returned promise to a JSON object
7. `async` is a keyword that is used to create functions that will return promises
8. `await` is a keyword that is used to tell a program to continue moving through the message queue while a promise resolves
9. `await` can only be used within functions declared with `async`

## 7 CSS

### 7.1 Media Queries

- 
- Rather than set breakpoints based on specific devices (too many different device screen sizes), the best practice is to resize your browser to view where the website naturally breaks based on its content. The dimensions at which the layout breaks or looks odd become your media query breakpoints. Within those breakpoints, we can adjust the CSS to make the page resize and reorganize
- The points at which media queries are set are called breakpoints. For example, if we want to target tablets that are in landscape orientation, we can create the following breakpoint:

```
@media only screen and (min-width: 768px) and (max-width: 1024px) and
(orientation: landscape) {
 /* CSS ruleset */
}
```

and `(min-width: 768px)` —This part of the rule is called a *media feature*, and instructs the CSS compiler to apply the CSS styles to devices with a width of 768px or larger

## 7.2 CSS Display and Positioning

- 
- Floated elements must have a width specified
- `Float` works for static and relative positioned elements
- If you're simply interested in moving an element as far left or as far right as possible on the page, you can use the `float` property

## 7.3 The box model

- All major web browsers have a default stylesheet they use in the absence of an external stylesheet. These default stylesheets are known as *user agent stylesheets*. In this case, the term "user agent" is a technical term for the browser
- The `overflow` property is set on a parent element to instruct a web browser how to render child elements. For example, if a `div`'s `overflow` property is set to `scroll`, all children of this `div` will display overflowing content with a scroll bar.
- Margin collapse: Unlike horizontal margins, vertical margins do not add. Instead, the larger of the two vertical margins sets the distance between adjacent elements (apply to nested elements as well)
- The `padding` property is often used to expand the background color and make content look less cramped
- By default, the dimensions of an HTML box are set to hold the raw contents of the box

## 7.4 Non-Inherited properties

To name but a few, non-inherited properties are:

`background`, `border`, `padding`, `margin`, `width`, `height`, `position`, etc.

## 7.5 Learn Responsive Design

1. **Historically**, the `em` represented the width of a capital letter M in the typeface and size being used. That is no longer the case. Today, the `em` represents the



size of the base font being used. For example, if the base font of a browser is 16 pixels (which is normally the default size of text in a browser), then 1 em is equal to 16 pixels. 2 ems would equal 32 pixels, and so on

2. A high resolution display may have a `min-resolution` of 150dpi
3. The height property is set to auto, meaning an image's height will automatically scale proportionally with the width

the last line will display images as block level elements (rather than inline-block, their default state)

```
.container {
 width: 50%;
 height: 200px;
 overflow: hidden;
}
```

```
.container img {
 max-width: 100%;
 height: auto;
 display: block;
}
```

Images or videos will shrink to the full width of their container, scale proportionally, and display partially if the image dimensions exceed container dimensions

It's worth memorizing the entire example above. It represents a very common design pattern used to scale images and videos proportionally

4. Percentages are often used to size box-model values, like width and height, padding, border, and margins. They can also be used to set positioning properties (top, bottom, left, right). When percentages are used, elements are sized relative to the dimensions of their parent element (also known as a container)

**Note:** Because the box model includes padding, borders, and margins, setting an element's width to 100% may cause content to overflow its parent container. While tempting, 100% should only be used when content will not have padding, border, or margin

5. Rem stands for root em. It acts similar to em, but instead of checking parent elements to size font, it checks the root element. The root element is the `<html>` tag

```
6. .splash-section {
 font-size: 18px;
}
```

```
.splash-section h1 {
 font-size: 1.5em;
}
```

Instead, a base font size (18px) is defined for all text within the `splash-section` element. The second CSS rule will set the font size of all `h1` elements inside of `splash-section` relative to the base font of `splash-section` (18 pixels). The resulting font size of `h1` elements will be 27 pixels.

#### 7.5.1 Percentages: Padding & Margin

1. When percentages are used to set padding and margin, however, they are calculated based only on the *width* of the parent element.

For example, when a property like `margin-left` is set using a percentage (say 50%), the element will be moved halfway to the right in the parent container (as opposed to the child element receiving a margin half of its parent's margin)

Vertical padding and margin are also calculated based on the width of the parent

## 7.6 display property

**Note:** Setting the display property of an element only changes **how the element is displayed**, NOT what kind of element it is. So, an inline element with `display: block;` is not allowed to have other block elements inside it.

## 7.7 Grid layout

1. flexbox is really meant for only specific use cases, like navigation bars (navbars)

## 7.8 p tag

1. `<figcaption><p>The <em>Cosmos</em> is all there is!</p></figcaption>`  
if you don't add p tag then there will be no space before or after Cosmos

## 8 npm

1. To update Node, the most reliable way is to download and install an updated installer package from their website (see link above). To update npm, use the following command in your terminal:

```
npm install npm@latest -g
```

## 9 DOM

1. `document.createElement()`

```
<!DOCTYPE html>
<html>
<head>
 <title>||Working with elements||</title>
</head>
<body>
 <div id="div1">The text above has been created dynamically.</div>
</body>
</html>
```

```
document.body.onload = addElement;
```

```
function addElement () {
 // create a new div element
 var newDiv = document.createElement("div");
 // and give it some content
 var newContent = document.createTextNode("Hi there and greetings!");
 // newDiv.textContent = "Hi there and greetings!";
}
```

```
// add the text node to the newly created div
newDiv.appendChild(newContent);

// add the newly created element and its content into the DOM
var currentDiv = document.getElementById("div1");
document.body.insertBefore(newDiv, currentDiv);
}
```

2. **Document** and **window** objects are the objects whose interfaces you generally use most often in DOM programming. In simple terms, the **window** object represents something like the browser, and the **document** object is the root of the document itself. **Element** inherits from the generic **Node** interface, and together these two interfaces provide many of the methods and properties you use on individual elements
3. That is to say, it's *written* in JavaScript, but it uses the DOM to access the document and its elements

## 10 中文笔记

- 
- 变量提升：JS会在词法分析阶段，把变量的声明语句提升到作用域的顶部

## 11 Abbr

block	块级	inline	内联	lexical	词法作用域
closure	闭包	render	渲染	container	容器
content	内容	form	表单	canvas	画布
component	组件	margin	外边距	style	样式
callback	回调	revert	回滚	collapse	折叠
template string 模板字符串			logical operators 逻辑运算符		
object destructure 对象解构			array destructure 数组解构		
logical operands: true false					