React组件化2

课堂目标

1. 掌握第三方组件正确使用方式
2. 能设计并实现自己的组件
3. 了解常见组件优化技术

知识要点

1. 使用antd
2. 设计并实现表单控件
3. 实现弹窗类组件
4. 实现树组件
5. 使用PureComponent、memo

资源

umi

ant design

知识点

快速开始

(https://www.html.cn/create-react-app/docs/getting-started/)

```
npx create-react-app my-app

cd lesson3

npm start
```

使用第三方组件

不必npm run eject，直接安装：`npm install antd --save`

范例：试用 ant-design组件库

```
import React, { Component } from 'react'
import Button from 'antd/es/button'
import "antd/dist/antd.css"

class App extends Component {
  render() {
    return (
      <div className="App">
        <Button
type="primary">Button</Button>
      </div>
    )
  }
}
export default App
```

配置按需加载

安装react-app-rewired取代react-scripts，可以扩展webpack的配置 ，类似vue.config.js。

由于新的 react-app-rewired@2.x 版本的关系，你还需要安装 customize-cra。

babel-plugin-import 是一个用于按需加载组件代码和样式的 babel 插件（原理）。

`npm install react-app-rewired customize-cra babel-plugin-import -D`

```
//根目录创建config-overrides.js
const { override, fixBabelImports } =
require("customize-cra");

module.exports = override(
  fixBabelImports("import", {//antd按需加载
    libraryName: "antd",
    libraryDirectory: "es",
    style: "css"
  })
);

//修改package.json
  "scripts": {
    "start": "react-app-rewired start",
    "build": "react-app-rewired build",
    "test": "react-app-rewired test",
    "eject": "react-app-rewired eject"
  },
```

支持装饰器配置

`npm install -D @babel/plugin-proposal-decorators`

```
//配置完成后记得重启下
const { addDecoratorsLegacy } =
require("customize-cra");

module.exports = override(
  ...,
  addDecoratorsLegacy()//配置装饰器
);
```

```
//按需加载和实现装饰器之后的页面如下：HocPage.js
import React, { Component } from "react";
import { Button } from "antd";

const foo = Cmp => props => {
  return (
    <div className="border">
      <Cmp {...props} />
    </div>
  );
};
const foo2 = Cmp => props => {
  return (
    <div className="border" style={{
border: "solid 1px red" }}>
```

```
      <Cmp {...props} />
    </div>
  );
};

@foo
@foo2
class Child extends Component {
  render() {
    return <div
className="border">child</div>;
  }
}
/* function Child(props) {
  return <div
className="border">child</div>;
} */
@foo2
class HocPage extends Component {
  render() {
    // const Foo = foo2(foo(Child));
    return (
      <div>
        <h1>HocPage</h1>
        <Child />
        <Button
type="dashed">click</Button>
```

```
      </div>
    );
  }
}

export default HocPage;
```

表单组件设计与实现

antd表单试用

```
import React, { Component } from "react";
import { Form, Input, Icon, Button } from
"antd";

const FormItem = Form.Item;

//校验规则
const nameRules = { required: true,
message: "please input your name" };
const passwordRules = { required: true,
message: "please input your password" };

@Form.create()
```

```
class FormPageDecorators extends Component
{
  handleSubmit = () => {
    /*  const { getFieldsValue,
getFieldValue } = this.props.form;
    console.log("submit",
getFieldsValue()); */

    const { validateFields } =
this.props.form;
    validateFields((err, values) => {
      if (err) {
        console.log("err", err);
      } else {
        console.log("submit", values);
      }
    });
  };
  render() {
    const { getFieldDecorator } =
this.props.form;
    // console.log(this.props.form);
    return (
      <div>
        <h1>FormPageDecorators</h1>
        <Form>
          <FormItem label="姓名">
```

```
            {getFieldDecorator("name", {
rules: [nameRules] })(
              <Input prefix={<Icon
type="user" />} />,
            )}
          </FormItem>
          <FormItem label="密码">
            {getFieldDecorator("password",
{ rules: [passwordRules] })(
              <Input type="password"
prefix={<Icon type="lock" />} />,
            )}
          </FormItem>
          <FormItem>
            <Button type="primary" onClick=
{this.handleSubmit}>
              提交
            </Button>
          </FormItem>
        </Form>
      </div>
    );
  }
}
export default FormPageDecorators;
// export default Form.create()
(FormPageDecorators);
```

表单组件设计思路

- 表单组件要求实现**数据收集**、**校验**、**提交**等特性，可通过高阶组件扩展
- 高阶组件给表单组件传递一个input组件**包装函数**接管其输入事件并统一管理表单数据
- 高阶组件给表单组件传递一个**校验函数**使其具备数据校验功能

表单组件实现

- 表单基本结构，创建MyFormPage.js

```
import React, { Component } from
"react";
import kFormCreate from
"../../components/kFormCreate";

const nameRules = { required: true,
message: "please input your name!" };
const passwordRules = {
  required: true,
  message: "please input your
password!",
};
class MyFormPage extends Component {
  handleSubmit = () => {
    const { getFieldValue } =
this.props;
    const res = {
      name: getFieldValue("name"),
      password:
getFieldValue("password"),
    };
    console.log("hah", res);
  };
  handleSubmit2 = () => {
    // 加入校验
    const { validateFields } =
this.props;
    validateFields((err, values) => {
      if (err) {
        console.log("validateFields",
err);
      } else {
        console.log("submit", values);
      }
    });
  };
  render() {
    const { getFieldDecorator } =
this.props;
    return (
      <div>
        <h1>MyFormPage</h1>
        <div>
          {getFieldDecorator("name", {
rules: [nameRules] })(
            <input type="text" />,
          )}
          {getFieldDecorator("password",
[passwordRules])(
            <input type="password" />,
          )}
        </div>
        <button onClick=
{this.handleSubmit2}>submit</button>
      </div>
    );
  }
}

export default kFormCreate(MyFormPage);
```

- 高阶组件kFormCreate：扩展现有表单，./components/kFormCreate.js

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

export default function kFormCreate(Cmp) {
  return class extends Component {
    constructor(props) {
      super(props);
      this.options = {}; //各字段选项
      this.state = {}; //各字段值
    }

    handleChange = e => {
      let { name, value } = e.target;
      this.setState({ [name]: value });
    };
    getFieldValue = field => {
      return this.state[field];
    };
    validateFields = callback => {
      const res = { ...this.state };
      const err = [];
      for (let i in this.options) {
        if (res[i] === undefined) {
          err.push({ [i]: "error" });
        }
      }
      if (err.length > 0) {
        callback(err, res);
      } else {
        callback(undefined, res);
      }
    };
    getFieldDecorator = (field, option)
=> {
      this.options[field] = option;
      return InputCmp => (
        <div>
          {// 由React.createElement生成的
元素不能修改，需要克隆一份再扩展
          React.cloneElement(InputCmp, {
            name: field,
            value: this.state[field] ||
"", //控件值
            onChange: this.handleChange,
//控件change事件处理
          })}
        </div>
      );
    };
    render() {
      return (
        <div className="border">
          <Cmp
            {...this.props}
            getFieldDecorator=
{this.getFieldDecorator}
            getFieldValue=
{this.getFieldValue}
            validateFields=
{this.validateFields}
          />
        </div>
      );
    }
  };
}
```

```
//用useState实现kFormCreate
import React, { useState } from "react";
const kFormCreate = Cmp => props => {
  const [state, setState] = useState({});
  const options = {};
  const handleChange = event => {
    setState({ ...state,
[event.target.name]: event.target.value });
  };

  const getFieldDecorator = (field, option)
=> {
    options[field] = option;
    return InpurtCmp => {
      return (
        <>
          {React.cloneElement(InpurtCmp, {
            name: field,
            value: state[field] || "",
            onChange: handleChange,
          })}
        </>
      );
    };
  };
  const getFieldsValue = () => {
    return { ...state };
  };
  const getFieldValue = field => {
    return state[field];
  };
  const validateFields = callback => {
    const res = { ...state };
    const err = [];
    for (let item in options) {
      if (res[item] === undefined) {
        err.push({ [item]: "error" });
        }
      }
      if (err.length) {
        callback(err, res);
      } else {
        callback(undefined, res);
      }
    };
    return (
      <div className="border">
        <Cmp
          {...props}
          getFieldDecorator=
{getFieldDecorator}
          getFieldsValue={getFieldsValue}
          getFieldValue={getFieldValue}
          validateFields={validateFields}
        />
      </div>
    );
};
export default kFormCreate;
```

弹窗类组件设计与实现

设计思路

弹窗类组件的要求弹窗内容在A处声明，却在B处展示。react中相当于弹窗内容看起来被render到一个组件里面去，实际改变的是网页上另一处的DOM结构，这个显然不符合正常逻辑。但是通过使用框架提供的特定API创建组件实例并指定挂载目标仍可完成任务。

```
// 常见用法如下：Dialog在当前组件声明，但是却在body中另一个div中显示
<div class="foo">
  <div> ... </div>
  {
    needDialog &&
    <Dialog>
       <header>Any Header</header>
       <section>Any content</section>
    </Dialog>
   }
</div>
```

具体实现

方案1：Portal

传送门，react v16之后出现的portal可以实现内容传送功能。

范例：Dialog组件

```
// Diallog.js
import React, { Component } from "react";
import { createPortal } from "react-dom";
import "./index.scss";

export default class Diallog extends
Component {
  constructor(props) {
    super(props);
    const doc = window.document;
    this.node = doc.createElement("div");
    doc.body.appendChild(this.node);
  }
  componentWillUnmount() {

 window.document.body.removeChild(this.node
);
  }
  render() {
    const { hideDialog } = this.props;
    return createPortal(
      <div className="dialog">
```

```
        {this.props.children}
        {typeof hideDialog === "function"
&& (
          <button onClick={hideDialog}>关掉
弹窗</button>
        )}
      </div>,
      this.node,
    );
  }
}
```

```
// Diallog/index.scss
.dialog {
  position: absolute;
  top: 0;
  right: 0;
  bottom: 0;
  left: 0;
  line-height: 30px;
  width: 400px;
  height: 300px;
  transform: translate(50%, 50%);
  border: solid 1px gray;
  text-align: center;
}
```

作业：用createPortal和hooks实现Dialog

方案2：unstable_renderSubtreeIntoContainer

在v16之前，实现“传送门”，要用到react中两个秘而不宣的React API

```
export class Dialog2 extends
React.Component {
  render() {
    return null;
  }

  componentDidMount() {
    const doc = window.document;
    this.node = doc.createElement("div");
    doc.body.appendChild(this.node);

    this.createPortal(this.props);
  }

  componentDidUpdate() {
    this.createPortal(this.props);
  }
  componentWillUnmount() {
    unmountComponentAtNode(this.node);

 window.document.body.removeChild(this.node
);
  }

  createPortal(props) {
    unstable_renderSubtreeIntoContainer(
      this, //当前组件
      <div className="dialog">
{props.children}</div>, // 塞进传送门的JSX
      this.node // 传送门另一端的DOM node
    );
  }
}
```

> 总结一下:
>
> 1. Dialog什么都不给自己画，render返回一个null就够了;
> 2. 它做得事情是通过调用createPortal把要画的东西画在DOM树上另一个角落。

树形组件设计与实现

设计思路

递归：自己调用自己

如计算f(n)=f(n-1)*n; n>0, f(1)=1

```
function foo(n) {
  return n===1 ? 1 : n*foo(n-1)
}
```

react中实现递归组件更加纯粹，就是组件递归渲染即可。假设我们的节点组件是TreeNode，它的render中只要发现当前节点拥有子节点就要继续渲染自己。节点的打开状态可以通过给组件一个open状态来维护。

实现

//TreeNode.js

```
import React, { Component } from "react";
import TreeNode from
"../../components/TreeNode";
//数据源
const treeData = {
  key: 0, //标识唯一性
  title: "全国", //节点名称显示
  children: [
    //子节点数组
    {
      key: 6,
      title: "北方区域",
      children: [
        {
          key: 1,
          title: "黑龙江省",
          children: [
            {
              key: 6,
              title: "哈尔滨",
            },
          ],
        },
        {
          key: 2,
          title: "北京",
        },
      ],
    },
    {
      key: 3,
      title: "南方区域",
      children: [
        {
          key: 4,
          title: "上海",
        },
        {
          key: 5,
          title: "深圳",
        },
      ],
    },
  ],
};
export default class TreePage extends
Component {
  render() {
    return (
      <div>
        <h1>TreePage</h1>
        <TreeNode data={treeData} />
      </div>
    );
  }
}
```

TreeNode.js

```
import React, { Component } from "react";
import classnames from "classnames";//先安装
下npm install classnames

export default class TreeNode extends
Component {
  constructor(props) {
    super(props);
    this.state = {
      expanded: false,
    };
  }
  handleExpanded = () => {
    this.setState({
      expanded: !this.state.expanded,
    });
  };
  render() {
    const { title, children } =
this.props.data;
    const { expanded } = this.state;
    const hasChildren = children &&
children.length > 0;
    return (
      <div>
```

```
        <div className="nodeInner" onClick=
{this.handleExpanded}>
          {hasChildren && (
            <i
              className={classnames("tri",
expanded ? "tri-open" : "tri-close")}
            ></i>
          )}
          <span>{title}</span>
        </div>
        {expanded && hasChildren && (
          <div className="children">
            {children.map(item => {
              return <TreeNode key=
{item.key} data={item} />;
            })}
          </div>
        )}
      </div>
    );
  }
}
```

```
/* 树组件css */
.nodeInner {
  cursor: pointer;
```

```css
}

.children {
  margin-left: 20px;
}

.tri {
  width: 20px;
  height: 20px;
  margin-right: 2px;
  padding-right: 4px;
}

.tri-close:after,
.tri-open:after {
  content: "";
  display: inline-block;
  width: 0;
  height: 0;
  border-top: 6px solid transparent;
  border-left: 8px solid black;
  border-bottom: 6px solid transparent;
}

.tri-open:after {
  transform: rotate(90deg);
}
```

常见组件优化技术

核心：只渲染需要被渲染的组件。

定制组件的shouldComponentUpdate钩子

范例：通过shouldComponentUpdate优化组件

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

import React, { Component } from "react";

export default class CommentListPage
extends Component {
  constructor(props) {
    super(props);
    this.state = {
      commentList: [],
    };
  }
  componentDidMount() {
    this.timer = setInterval(() => {
      this.setState({
        commentList: [
          {
            id: 0,
            author: "小明",
            body: "这是小明写的文章",
          },
          {
            id: 1,
            author: "小红",
            body: "这是小红写的文章",
          },
        ],
      });
    }, 1000);
  }
  render() {
    const { commentList } = this.state;
    return (
      <div>
        <h1>CommentListPage</h1>
        {commentList.map(item => {
          return <Comment key={item.id}
data={item} />;
        })}
      </div>
    );
  }
}

class Comment extends Component {
  shouldComponentUpdate(nextProps,
nextState) {
    const { author, body } =
this.props.data;
    const { author: newAuthor, body:
newBody } = nextProps.data;
    if (author === newAuthor && body ===
newBody) {
      return false; //如果不执行这里，将会多次
render
    }
    return true;
  }
  render() {
    const { author, body } =
this.props.data;
    return (
      <div className="border">
        <p>{author}</p>
        <p>{body}</p>
      </div>
    );
  }
```

```
}
```

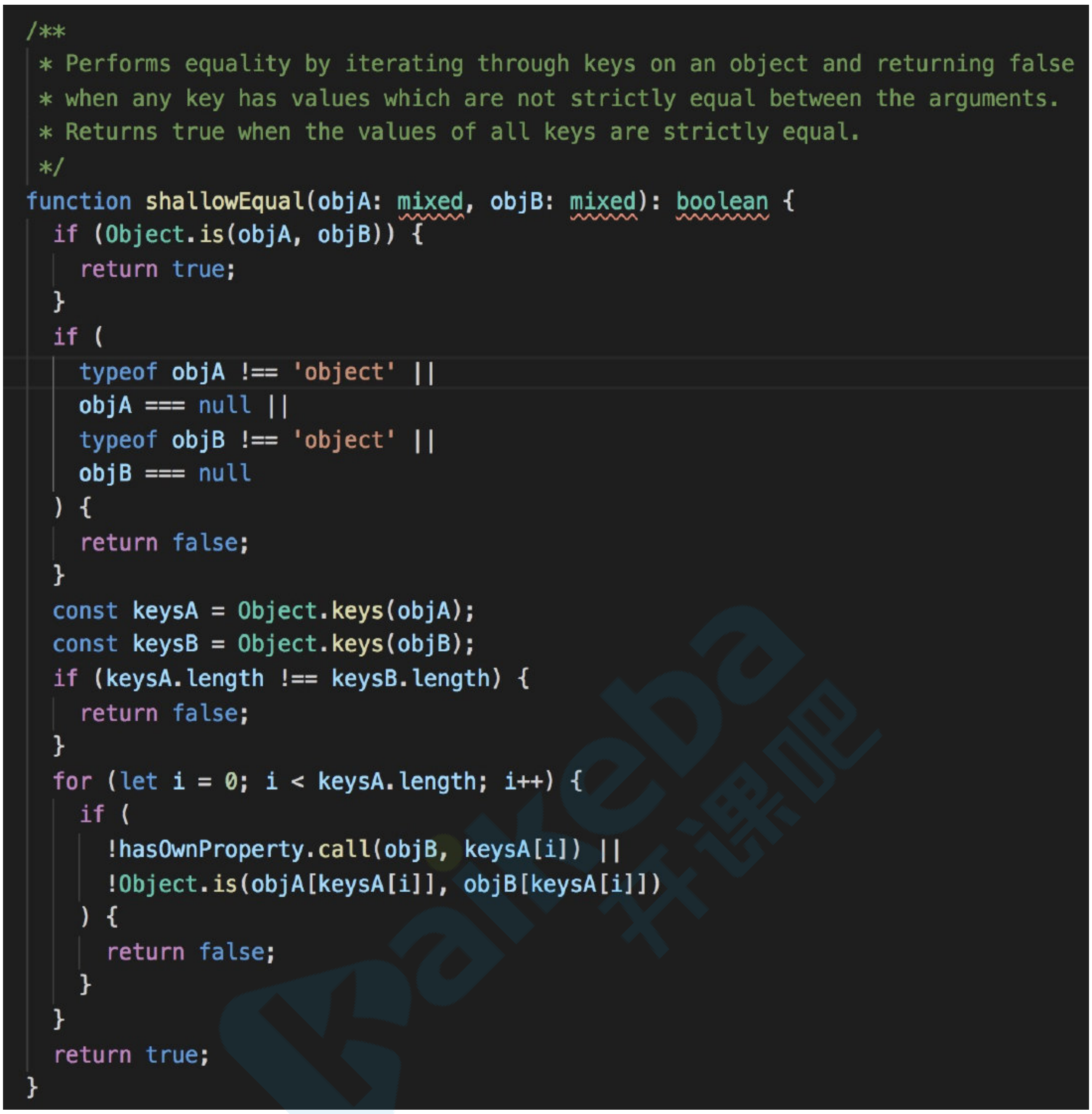
PureComponent

定制了shouldComponentUpdate后的Component

```
import React, { Component, PureComponent }
from "react";

export default class PureComponentPage
extends PureComponent {
  constructor(props) {
    super(props);
    this.state = {
      counter: 0,
      // obj: {
      //   num: 2,
      // },
    };
  }

  setCounter = () => {
    this.setState({
      counter: 100,
      // obj: {
```

```
      //     num: 200,
      // },
    });
  };

  render() {
    const { counter, obj } = this.state;
    console.log("render");
    return (
      <div>
        <h1>PuerComponentPage</h1>
        <div onClick=
{this.setCounter}>counter: {counter}</div>
      </div>
    );
  }
}
```

缺点是必须要用class形式，而且要注意是**浅比较**



```
/**
 * Performs equality by iterating through keys on an object and returning false
 * when any key has values which are not strictly equal between the arguments.
 * Returns true when the values of all keys are strictly equal.
 */
function shallowEqual(objA: mixed, objB: mixed): boolean {
  if (Object.is(objA, objB)) {
    return true;
  }
  if (
    typeof objA !== 'object' ||
    objA === null ||
    typeof objB !== 'object' ||
    objB === null
  ) {
    return false;
  }
  const keysA = Object.keys(objA);
  const keysB = Object.keys(objB);
  if (keysA.length !== keysB.length) {
    return false;
  }
  for (let i = 0; i < keysA.length; i++) {
    if (
      !hasOwnProperty.call(objB, keysA[i]) ||
      !Object.is(objA[keysA[i]], objB[keysA[i]])
    ) {
      return false;
    }
  }
  return true;
}
```

React.memo

`React.memo(...)`是React v16.6引进来的新属性，是一个高阶组件。它的作用和`React.PureComponent`类似，是用来控制函数组件的重新渲染的。`React.memo(...)` 其实就是函数组件的

`React.PureComponent`。

```
import React, { Component, memo } from
"react";

export default class ReactMemoPage extends
Component {
  constructor(props) {
    super(props);
    this.state = {
      date: new Date(),
      counter: 0,
    };
  }
  componentDidMount() {
    this.timer = setInterval(() => {
      this.setState({
        date: new Date(),
        //counter: this.state.counter + 1,
      });
    }, 1000);
  }
  componentWillUnmount() {
    clearInterval(this.timer);
  }
  render() {
    const { counter, date } = this.state;
    console.log("render", counter);
    return (
      <div>
        <h1>ReactMemoPage</h1>
        <p>{date.toLocaleTimeString()}</p>
        <MemoCounter counter={counter} />
      </div>
    );
  }
}

const MemoCounter = memo(props => {
  console.log("MemoCounter");
  return <div>{props.counter}</div>;
});
```

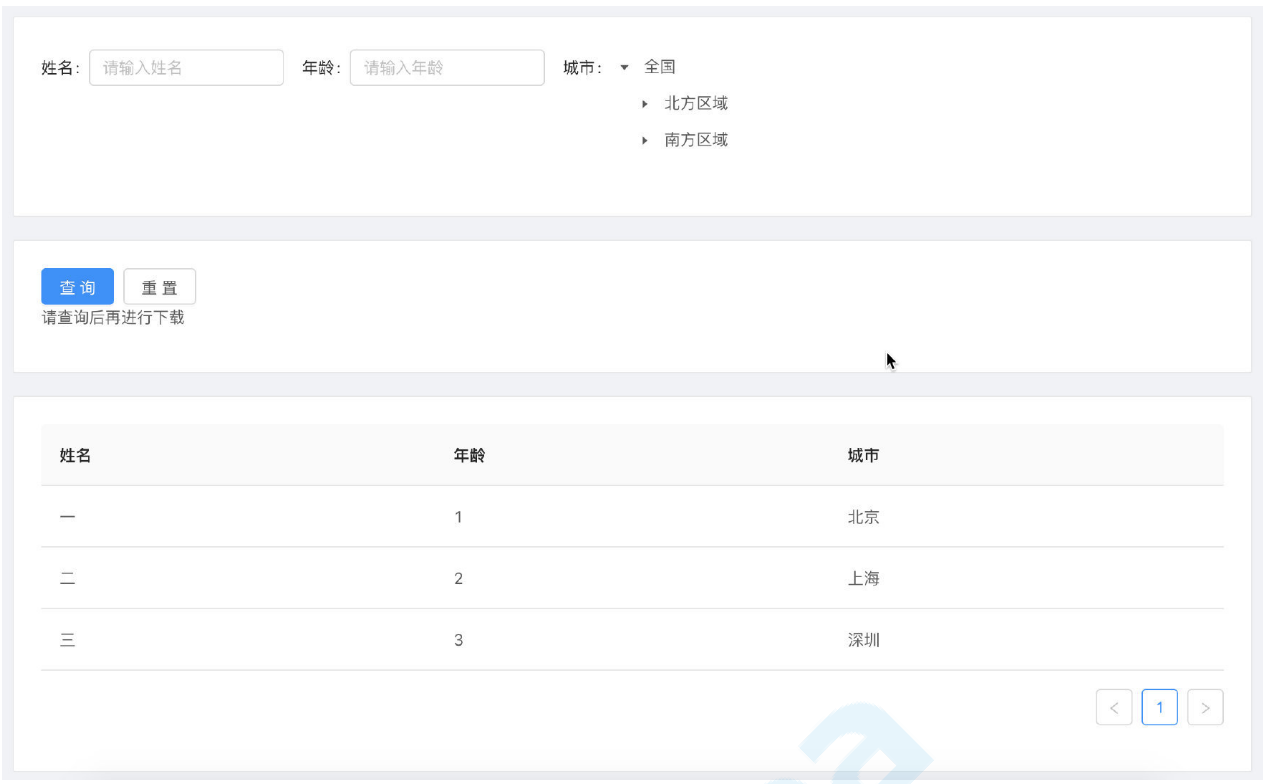
作业

1. 用function组件实现树组件
2. 用createPortal和hooks实现Dialog

```
import React, { useEffect } from
"react";
import { createPortal } from "react-
dom";
```

```
export default function Dialog() {
  const doc = window.document;
  const node = doc.createElement("div");
  doc.body.appendChild(node);
  useEffect(() => {
    return () => {

 window.document.body.removeChild(node);
    };
  }, []);
  return createPortal(
    <div className="dialog">
      <h1>dialog</h1>
    </div>,
    node,
    // window.document.body
  );
}
```

3. 拓展作业，实现下图：



请查询后再进行下载

姓名	年龄	城市
一	1	北京
二	2	上海
三	3	深圳

提示：可以使用antd的 Card、Input、Tree、Button、Form、Table