iSpan
LEARNING UNLIMITED

Vue3 工作坊

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資展國際股份有限公司

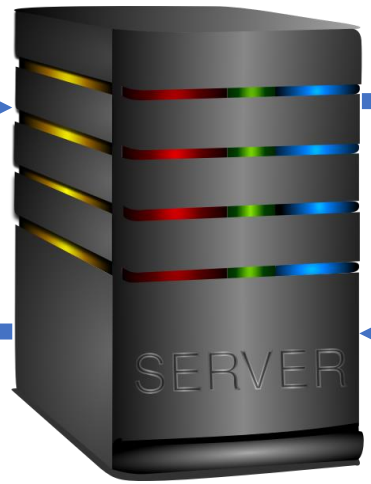
網頁開發架構

瀏覽器

https://www.ispan.com.tw/

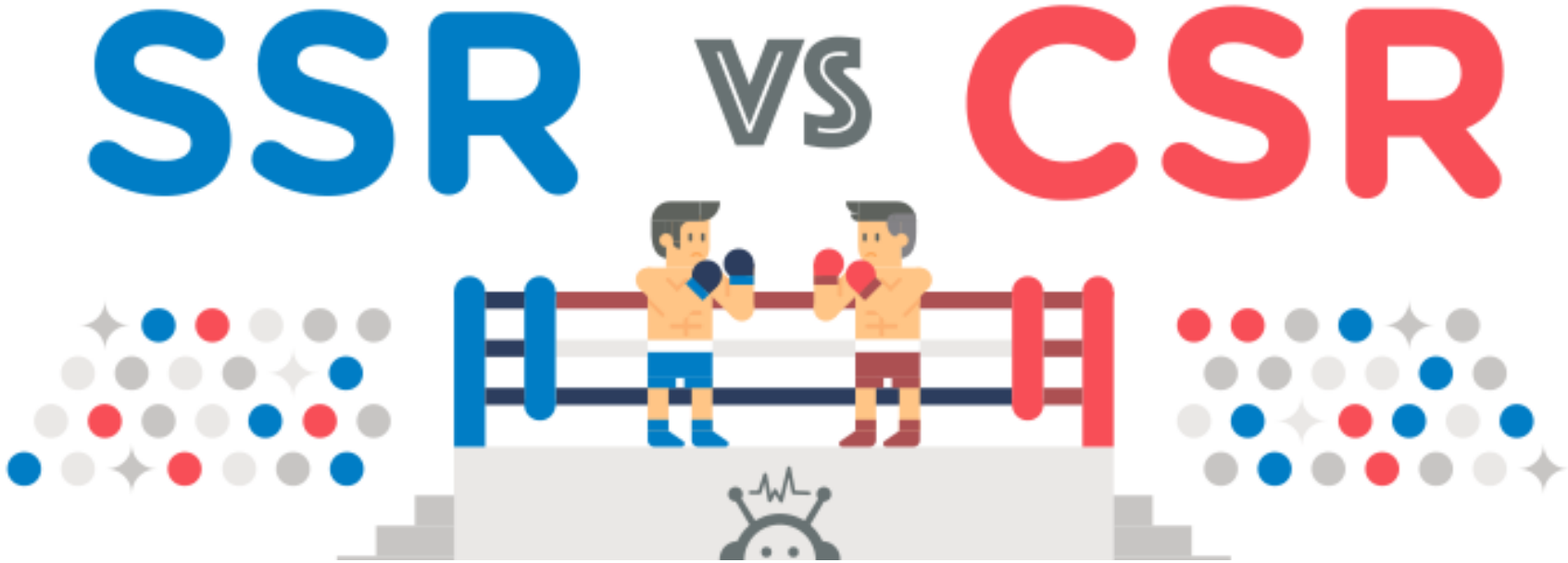
HTTP Request

HTTP Response

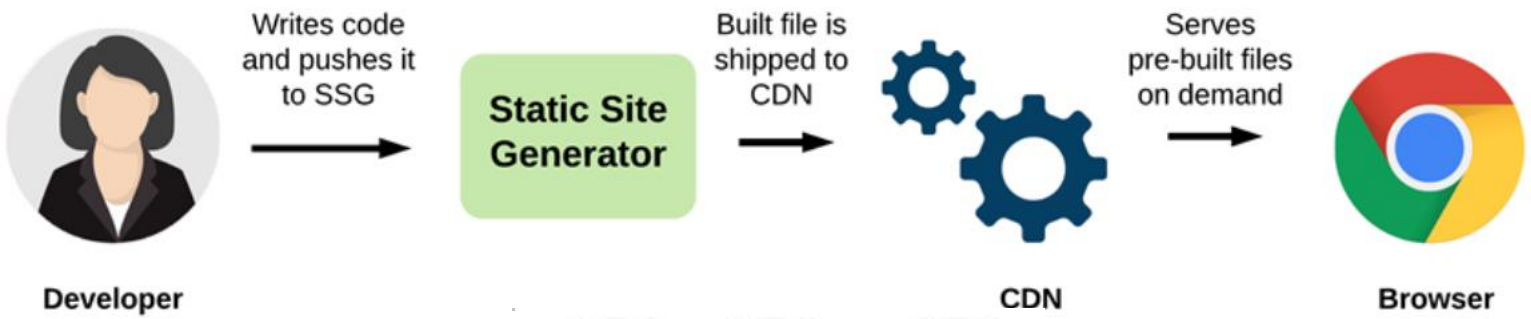


網站伺服器

資料庫



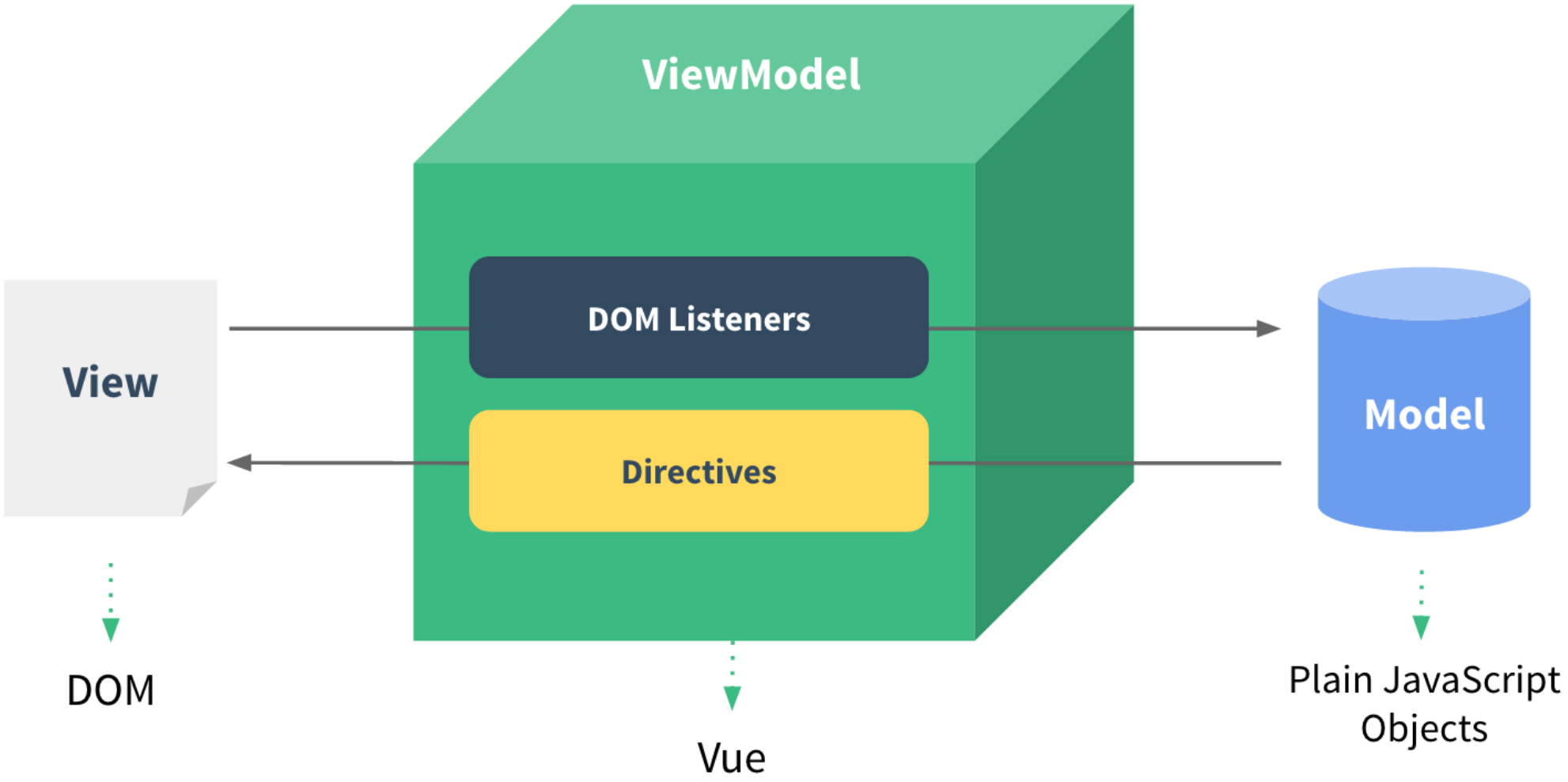
圖片來源：https://medium.com/walmartglobaltech/the-benefits-of-server-side-rendering-over-client-side-rendering-5d07ff2cefe8



圖片來源： https://www.partech.nl/nl/ ack-series-part-1-of-4-basics-of-jamstack#

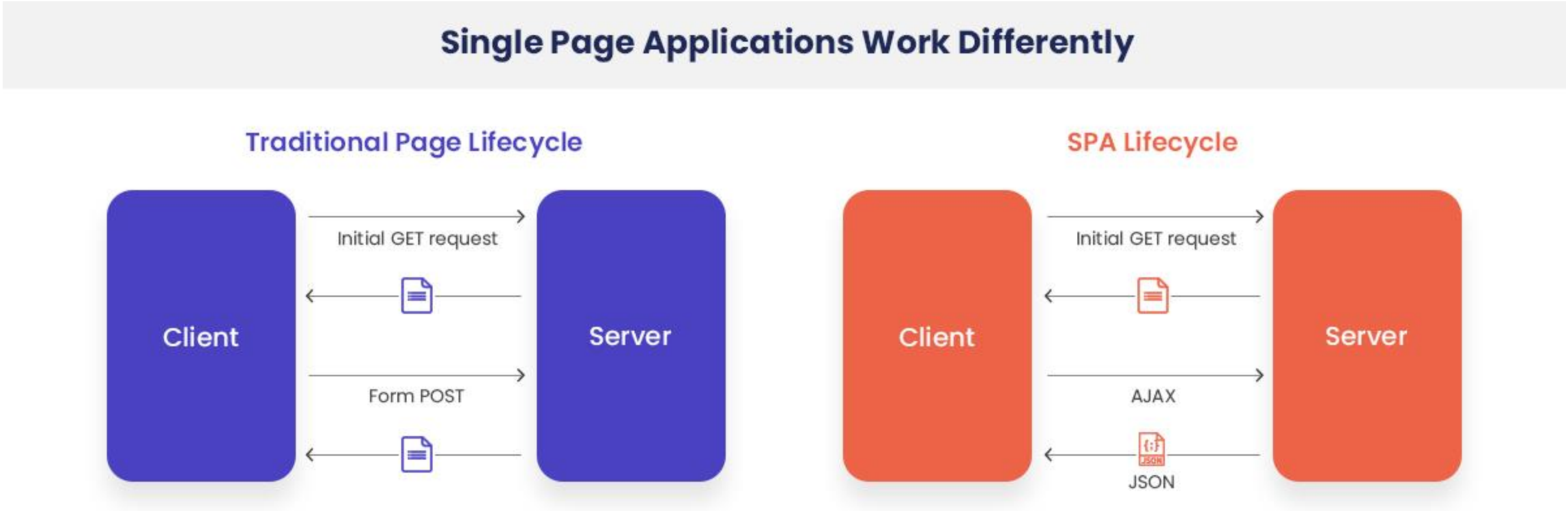
SSG

MVVM

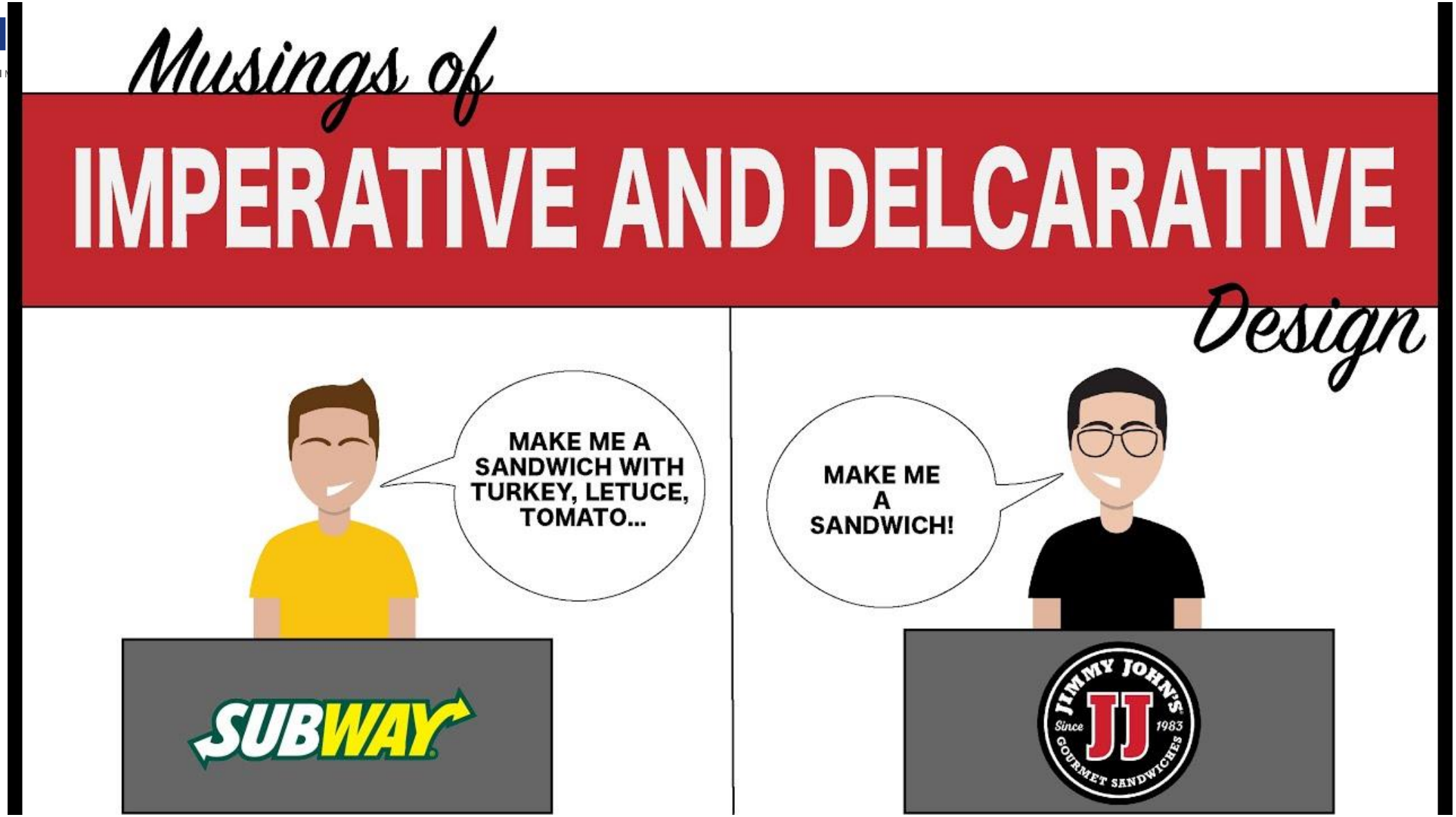


圖片來源：https://012.vuejs.org/guide/

Single Page Application



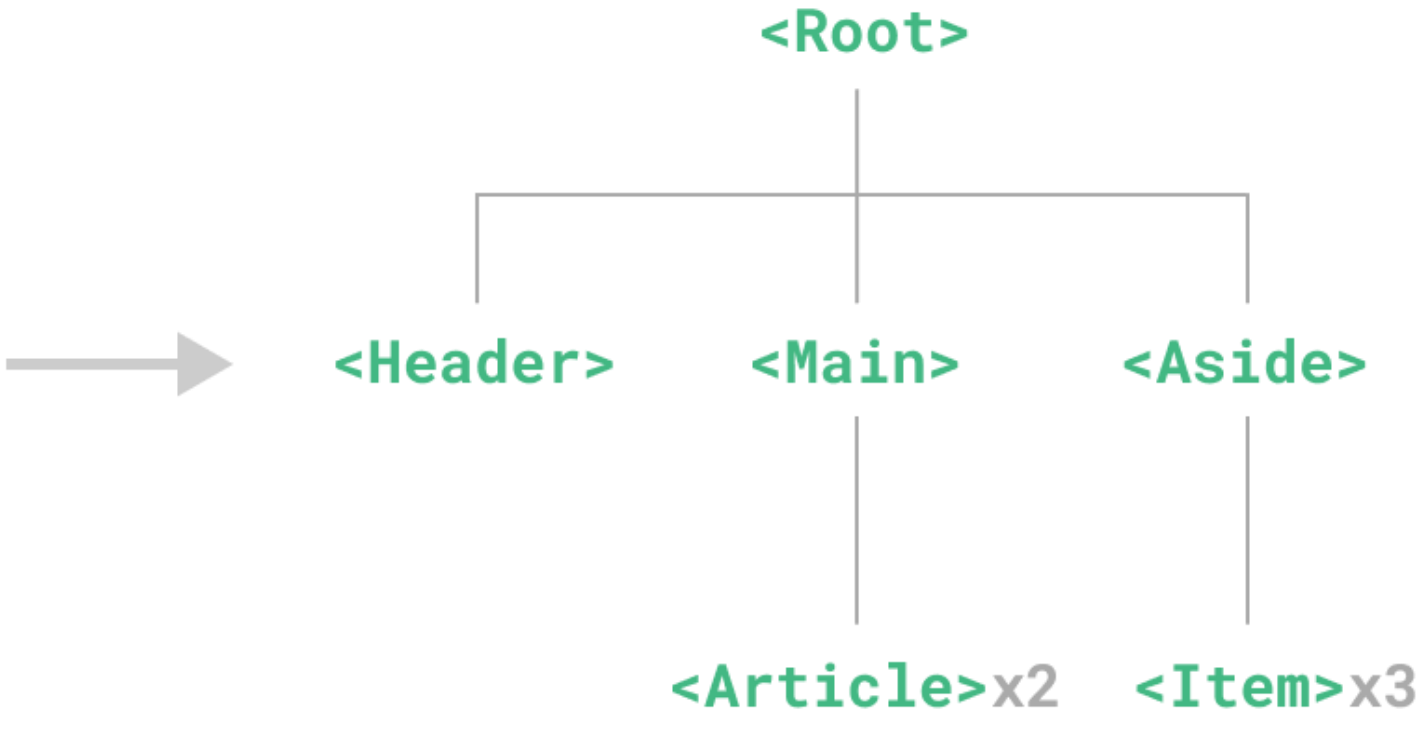
圖片來源：https://www.excellentwebworld.com/what-is-a-single-page-application/



圖片來源：https://www.youtube.com/watch?v=Xn5YVwTVC_I

Single File Component(SFC)

元件、組件



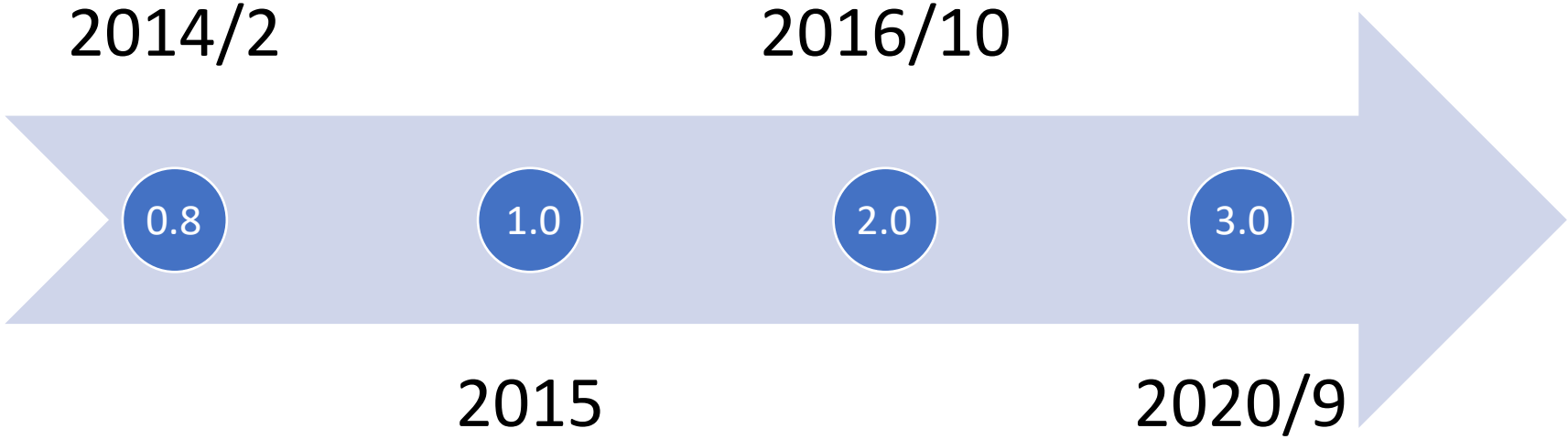
Vue3 生态进展和计划@尤雨溪_VueConf CN 2021

https://www.youtube.com/watch?v=On6V97n_iEE

https://vuejs.org/

The Progressive JavaScript Framework

An approachable, performant and versatile framework for building web user interfaces.



Vue 簡單用

- 在 head 標籤中引用 Vue 的 CDN

```
<script src="https://unpkg.com/vue@3/dist/vue.global.js"></script>
```

- 設定 Vue 要控制的 HTML 範圍

```
<div id="app">
</div>
```

Vue 與 HTML 的綁定

- 透過 createApp 函式(function)建立 Vue 的物件
- 使用mount()方法，綁定 Vue 管理的 HTML 範圍

```
const { createApp } = Vue
const app = createApp({
    //Options api(Vue2 / Vue3) 或 Composition API(Vue3)
})
app.mount('#app')
```

Options api

Options: State

data

props

computed

methods

watch

emits

expose

Options: Rendering

template

render

compilerOptions

Options: Lifecycle

beforeCreate

created

beforeMount

mounted

beforeUpdate

updated

beforeUnmount

unmounted

errorCaptured

renderTracked

renderTriggered

activated

deactivated

Options: Misc

name

inheritAttrs

components

directives

Component Instance

$data

$props

$el

$options

$parent

$root

官方文件：https://vuejs.org/api/

Composition API

setup()

- Basic Usage
- Accessing Props
- Setup Context
- Usage with Render Functions

Reactivity: Core

- ref()
- computed()
- reactive()
- readonly()
- watchEffect()
- watchPostEffect()

Reactivity: Utilities

- isRef()
- unref()
- toRef()
- toRefs()
- isProxy()
- isReactive()
- isReadonly()

Reactivity: Advanced

- shallowRef()
- triggerRef()
- customRef()

Lifecycle Hooks

- onMounted()
- onUpdated()
- onUnmounted()
- onBeforeMount()
- onBeforeUpdate()
- onBeforeUnmount()
- onErrorCaptured()
- onRenderTracked()
- onRenderTriggered()
- onActivated()
- onDeactivated()
- onServerPrefetch()

官方文件：https://vuejs.org/api/

試試看

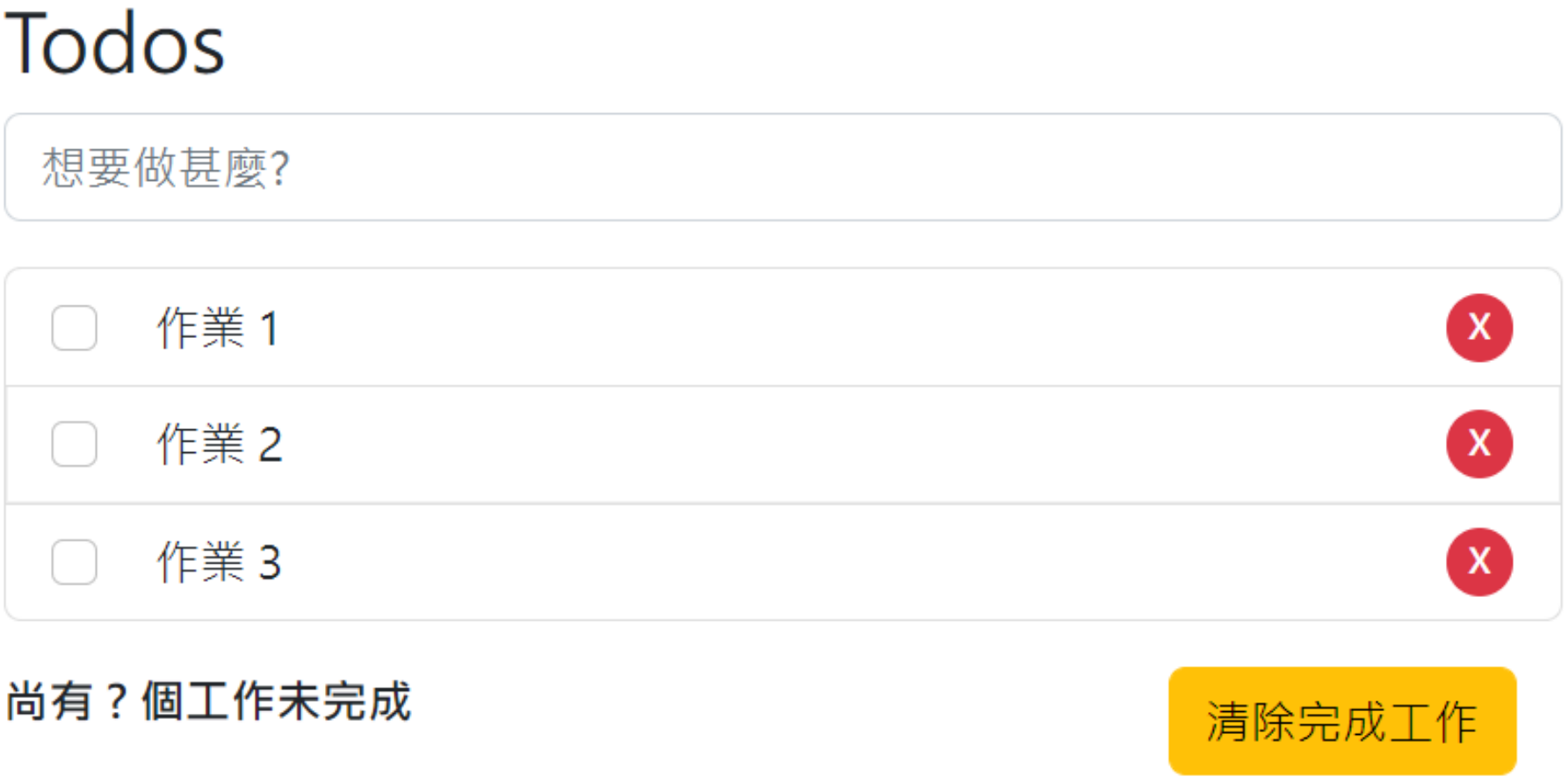
```
<script src="https://unpkg.com/vue@3/dist/vue.global.js"></script>
<div id="app"> {{ message }} </div>
<script>
const { createApp } = Vue
const app = createApp({
    data() {
        return {
            message: 'Hello Vue!’
        }
    }
})
app.mount('#app’)
</script>
```

{{ }} Mustache 兩個大括號

{{ }} 裡面的內容表示一段會回傳結果的 JavaScript 程式碼

Hello Vue!

Vue 初體驗 - todos



範例參考： https://todomvc.com/

todos 資料顯示 - html

- 讀取陣列、物件中的資料，使用 v-for Directives

```
<ul class="list-group mt-3">
  <li v-for="todo in todos" class="list-group-item">
    <div class="d-flex justify-content-between">
      <div>
        <input class="form-check-input me-3" type="checkbox">
        <label class="form-check-label" for="firstCheckbox"> {{todo.title}} </label>
      </div>
      <button class="badge bg-danger rounded-pill border-0">X</button>
    </div>
  </li>
</ul>
```

Directives

- v-text
- v-html
- v-show
- v-if
- v-else
- v-else-if
- v-for
- v-on
- v-bind
- v-model
- v-slot
- v-pre
- v-once
- v-memo
- v-cloak

Directives文件參考：https://vuejs.org/api/built-in-directives.html

todos 資料顯示 - vue

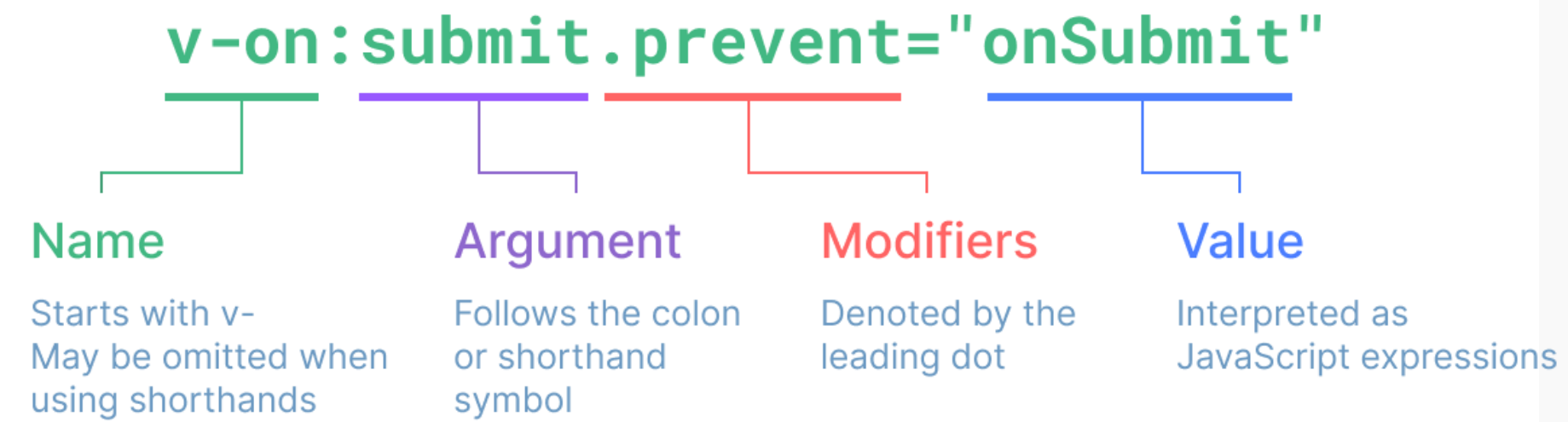
```
<script>
    const { createApp } = Vue
    const app = createApp({
      data() {
        return {
          todos: [
            { "id": 1, "title": "作業1", "completed": false },
            { "id": 2, "title": "作業2", "completed": false },
            { "id": 3, "title": "作業3", "completed": false }],
        }
      }
    })
    app.mount('#app')
</script>
```

todo 資料新增 - html

- 雙向繫節 v-model、事件綁定 v-on(@)

```
<input type="text" v-model="newTodo" placeholder="想要做甚麼?" @keyup.enter="addTodo">
```

- .enter
- .tab
- .delete
- .esc
- .space
- .up
- .down
- .left
- .right



Directives

- v-text
- v-html
- v-show
- v-if
- v-else
- v-else-if
- v-for
- v-on
- v-bind
- v-model
- v-slot
- v-pre
- v-once
- v-memo
- v-cloak

odifiers 文件參考：https://vuejs.org/guide/essentials/event-handling.html#key-modifiers

todo 資料新增 - vue

```
data() {
   return {
      todos: [{ "id": 1, "title": "作業1", "completed": false }, { "id": 2, "title": "作業2", "completed": false },{…}],
       newTodo: ‘’
      }
 },
 methods: {
   addTodo() {
      const value = this.newTodo && this.newTodo.trim();
      if (!value) {
         return;
      }
      this.todos.push({ "id": this.todos.length + 1, "title": value, "completed": false });
         this.newTodo = '';
       }
},
```

todo 資料刪除 – html & vue

- 事件綁定 v-on(@) Directives

```
<button @click="removeTodo(todo)" class="badge bg-danger rounded-pill  border-0">X</button>
```

```
data() {
   return {
      todos: [{ "id": 1, "title": "作業1", "completed": false }, { "id": 2, "title": "作業2", "completed": false },
       newTodo: ‘’
      }
 },
 methods: {
     removeTodo(todo) {
       const index = this.todos.indexOf(todo);
       this.todos.splice(index, 1);
    },
},
```

Directives

- v-text
- v-html
- v-show
- v-if
- v-else
- v-else-if
- v-for
- v-on
- v-bind
- v-model
- v-slot
- v-pre
- v-once
- v-memo
- v-cloak

勾選完成的 todo - html

- 雙向繫節 v-model Directives
- 樣式 class 繫節 v-bind(:)
  - todo.completed 為 true 就會套用 completed 類別樣式

```
<input v-model="todo.completed" class="form-check-input me-3" type="checkbox">
<label :class="{ completed: todo.completed }" class="form-check-label">{{todo.title}}</label>
```

```
<style>
   .completed {
      color: #949494;
      text-decoration: line-through;
   }
</style>
```

將 todos 儲存在 localStorage 中

- 使用 watch 屬性，用來監看某個值，值改變時就會執行
  - handler(newValue, oldValue){ 值改變時執行這裡的程式 }
  - Immediate屬性：設定成 true 表示載入元件就會執行
  - deep屬性：設定成 true 就能監看物件中的屬性是否改變

```
watch: {
   todos: {
      handler(todos) {
         localStorage.setItem("todos", JSON.stringify(todos))
      },
      deep: true
   }
},
```

計算還有多少 todos 要做

- 使用 computed 屬性
  - computed 函式用到 data 的資料，這些資料改變時，這個 computed 函式就會被重新執行和求值
  - computed 中的函式必須要有一個回傳值
  - computed 中的函式無法傳入參數

```
<strong class="me-3">尚有 {{ remaining }} 個工作未完成</strong>
```

```
computed: {
    remaining() {
        let activeTodos = this.todos.filter(todo => !todo.completed)
        return activeTodos.length
    }
},
```

清除所有完成的 todos - html & vue

```
 <button class="btn btn-warning me-3" @click="removeComplete">清除完成工作
</button>
```

```
methods: {
    removeComplete() {
        this.todos = this.todos.filter(todo =>!todo.completed)
    }
},
```

todos 資料修改 - html

- 顯示畫面

```
<div v-if="editedTodo !== todo" class="d-flex justify-content-between align-items-center">
  <div>
    <input v-model="todo.completed" class="form-check-input me-3" type="checkbox">
    <label v-bind:class="{ completed: todo.completed }" @dblclick="editTodo(todo)"
           class="form-check-label"> {{todo.title}} </label>
    </div>
    <button @click="removeTodo(todo)" class="badge bg-danger rounded-pill">X</button>
</div>
```

- 編輯畫面

```
<input v-else type="text" v-model="todo.title" class="form-control" @blur="doneEdit(todo)"
@keyup.enter="doneEdit(todo)" @keyup.escape="cancelEdit(todo)">
```

todos 資料修改 - vue

```
data() {
   return {
      todos: JSON.parse(localStorage.getItem("todos") || '[]'),
      newTodo: ‘’,
      editedTodo: null,
      beforeEditCache: ''
   }
},
```

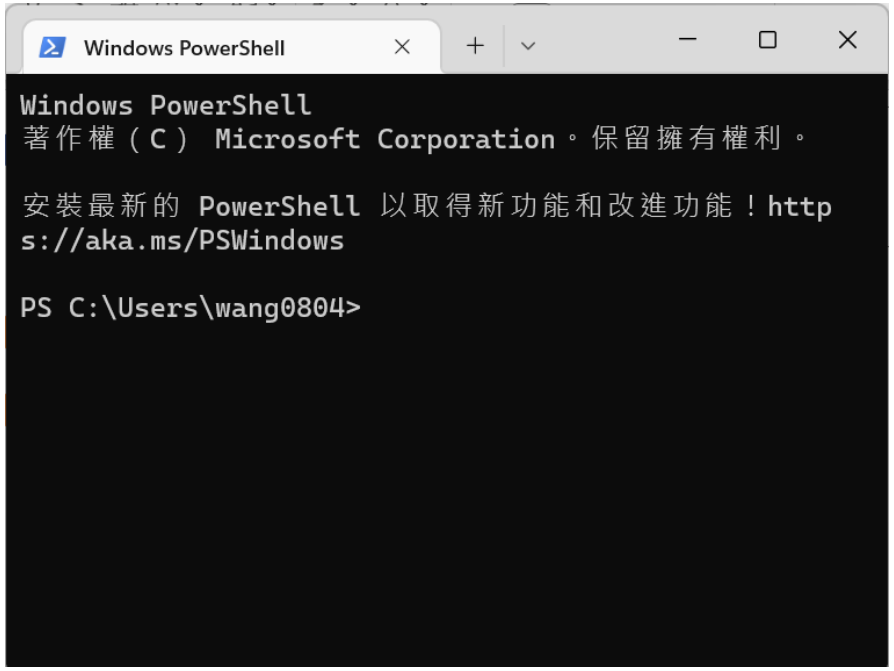
```
methods: {
   editTodo(todo) {
      this.beforeEditCache = todo.title
      this.editedTodo = todo
   },
   doneEdit(todo) {
      todo.title = todo.title.trim()
      this.editedTodo = null
    },
    cancelEdit(todo) {
       this.editedTodo = null
       todo.title = this.beforeEditCache
    },
},
```

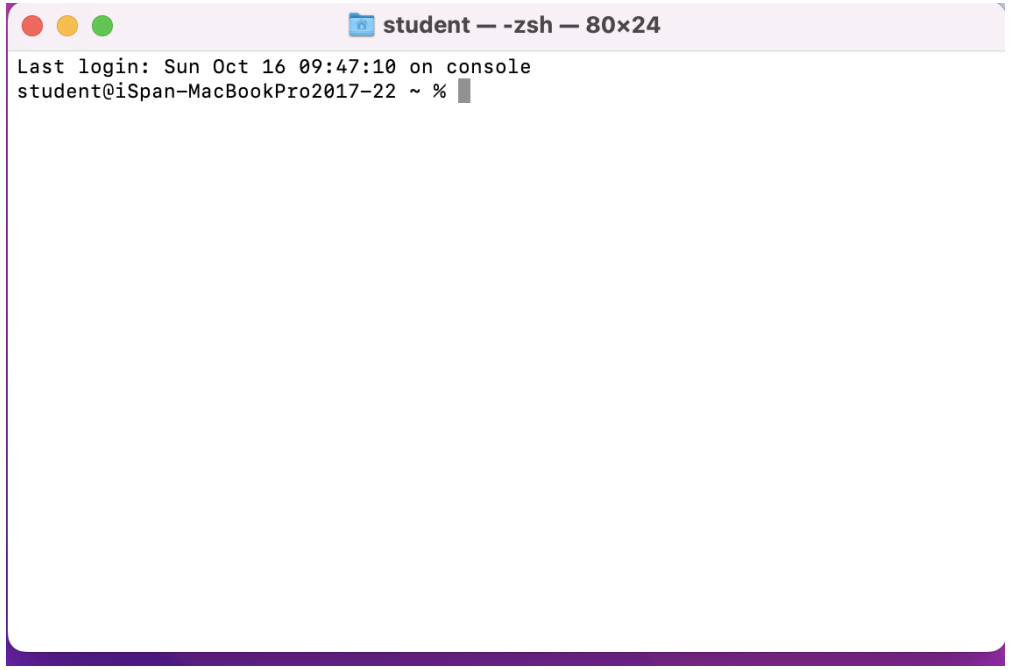
建立 Vue 應用程式

- 熟悉終端機指令的基本操作
- 安裝 Node.js 16.0 以上的版本

預備知識

- 熟悉終端機指令的基本操作





指令參考：https://ftp.kh.edu.tw/Linux/Redhat/en_6.2/doc/gsg/ch-doslinux.htm

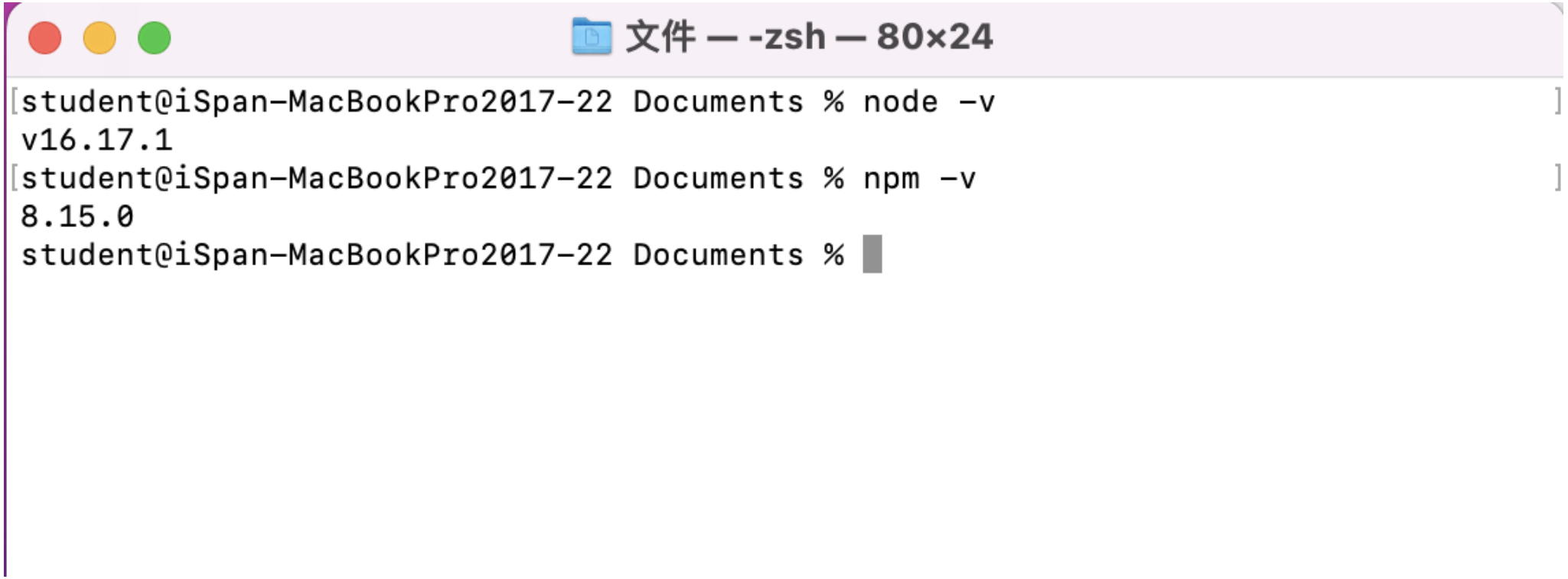
- 安裝 Node.js 16.0 以上的版本

安裝 node.js

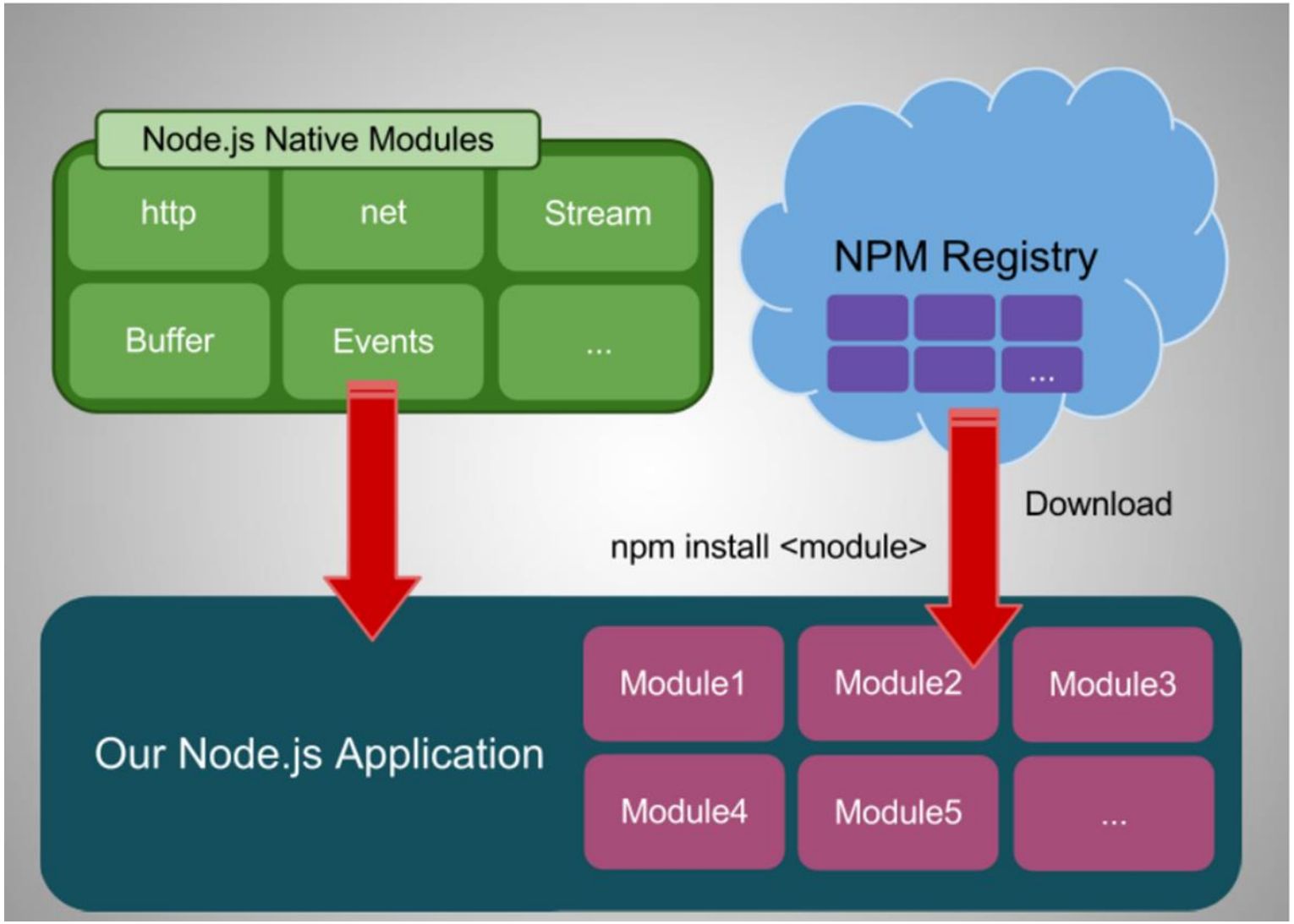
下載網址：https://nodejs.org/zh-tw/download/

安裝完成後的測試

- 輸入 node –v 查看 node.js 的版本
- 輸入 npm -v 查看 npm 的版本

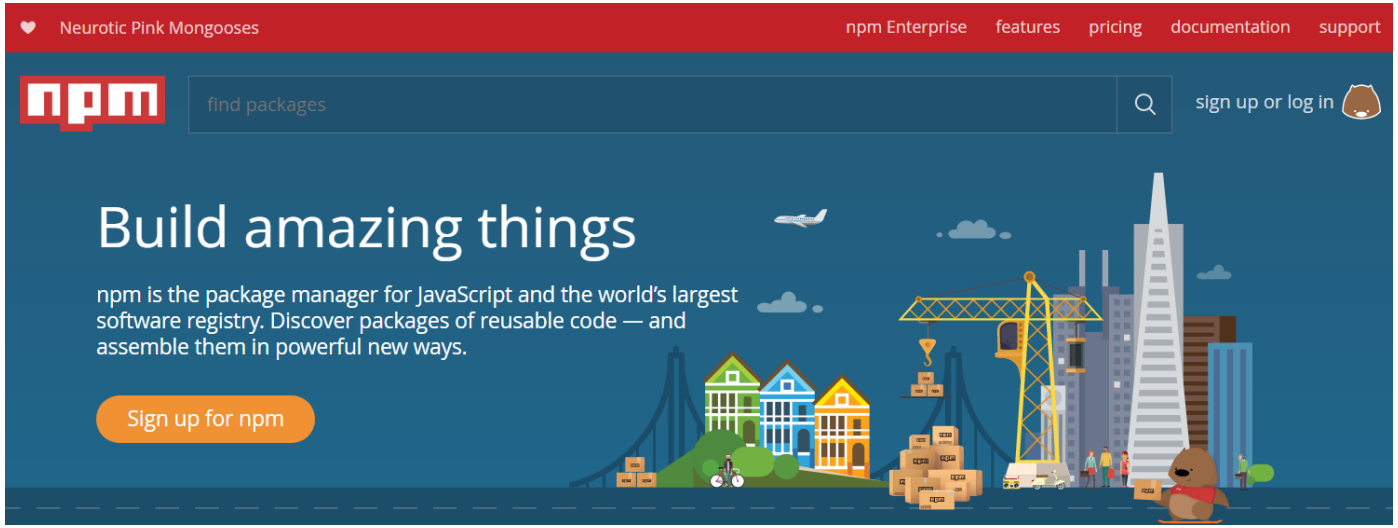


Module 和 Package



NPM 套件管理工具

- Node Package Manager(npm)是Node.js的套件(package)管理工具.
  - 可以用來搜尋、安裝新的套件，也可用來列出已安裝的套件
- Node.js在0.6.3的版本之後開始內建npm



https://www.npmjs.org/

npm help

文件 — -zsh — 80×24

```
[student@iSpan-MacBookPro2017-22 Documents % npm help                          ]
npm <command>

Usage:

npm install        install all the dependencies in your project
npm install <foo>  add the <foo> dependency to your project
npm test           run this project's tests
npm run <foo>      run the script named <foo>
npm <command> -h   quick help on <command>
npm -l             display usage info for all commands
npm help <term>    search for help on <term>
npm help npm       more involved overview

All commands:

    access, adduser, audit, bin, bugs, cache, ci, completion,
    config, dedupe, deprecate, diff, dist-tag, docs, doctor,
    edit, exec, explain, explore, find-dupes, fund, get, help,
    hook, init, install, install-ci-test, install-test, link,
    ll, login, logout, ls, org, outdated, owner, pack, ping,
    pkg, prefix, profile, prune, publish, rebuild, repo,
    restart, root, run-script, search, set, set-script,
    shrinkwrap, star, stars, start, stop, team, test, token,
```

npm 常用指令 1

- npm help [指令名稱]：查詢指令詳細用法
- npm init：建立package.json
- npm init –y：不用詢問建立package.json
- npm install [套件名稱] -g：-g 表示全域安裝
- npm install [套件名稱]：安裝套件在目前專案中
  - 安裝套件記錄在 package.json 的 dependencies 中
- npm install [套件名稱] --save-dev(縮寫-D)
  - 安裝套件記錄在 package.json 的 devDependencies 中

npm 常用指令 2

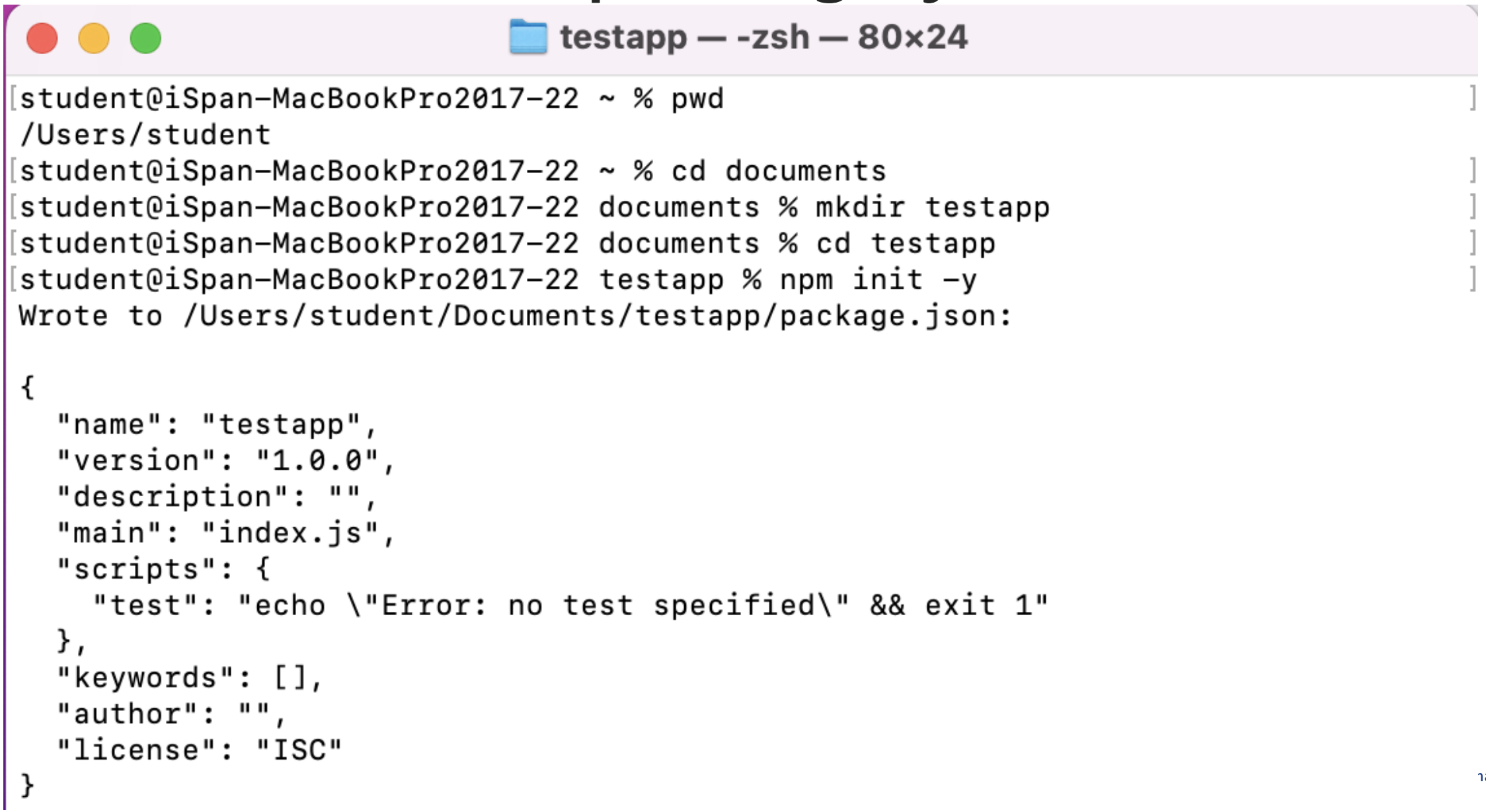
- npm uninstall [套件名稱] ：移除套件
- npm uninstall [套件名稱] –g ：移除全域套件
- npm search [套件名稱] ：搜尋套件
- npm home [套件名稱]：套件所在網址
- npm info [套件名稱] version：套件最新版本
- npm list：列出已安裝套件
- npm update：升級所有套件
- npm update [套件名稱]：升級指定套件
- npm view [套件名稱] version：檢視某個套件的版本

Package.json

- 描述 nodejs 專案的相關資訊，專案安裝了甚麼套件也會記錄在這個檔案中

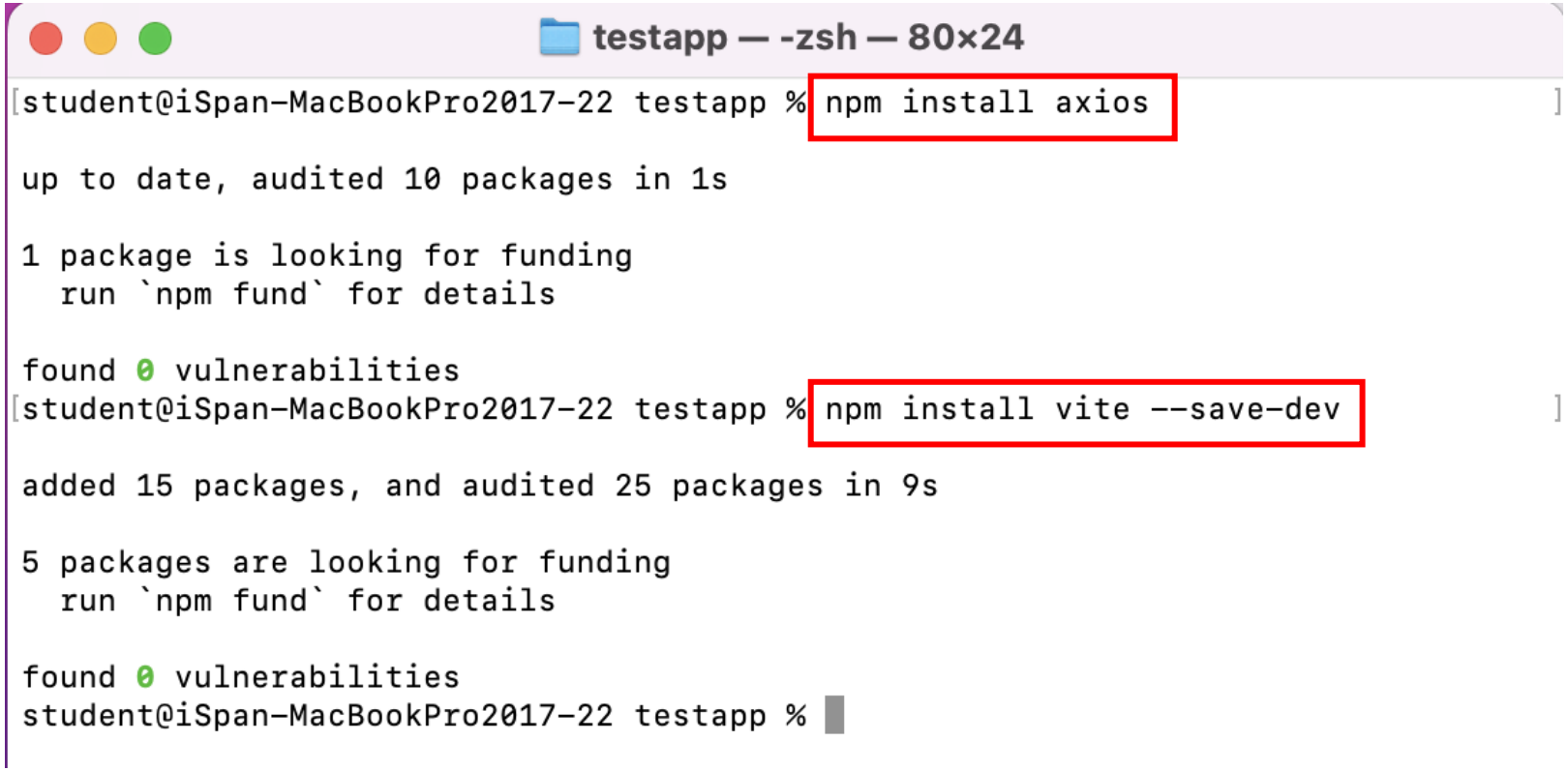
```
{
  "name": "application-name",
  "version": "0.0.1",
  "private": true,
  "scripts": {
    "start": "node app.js"
  },
  "dependencies": {
    "express": "3.4.8",
    "jade": "*",
    "socket.io": “latest“,
    “mongoose”: “>=2.5.3”
  }
}
```

建立 package.json



安裝套件

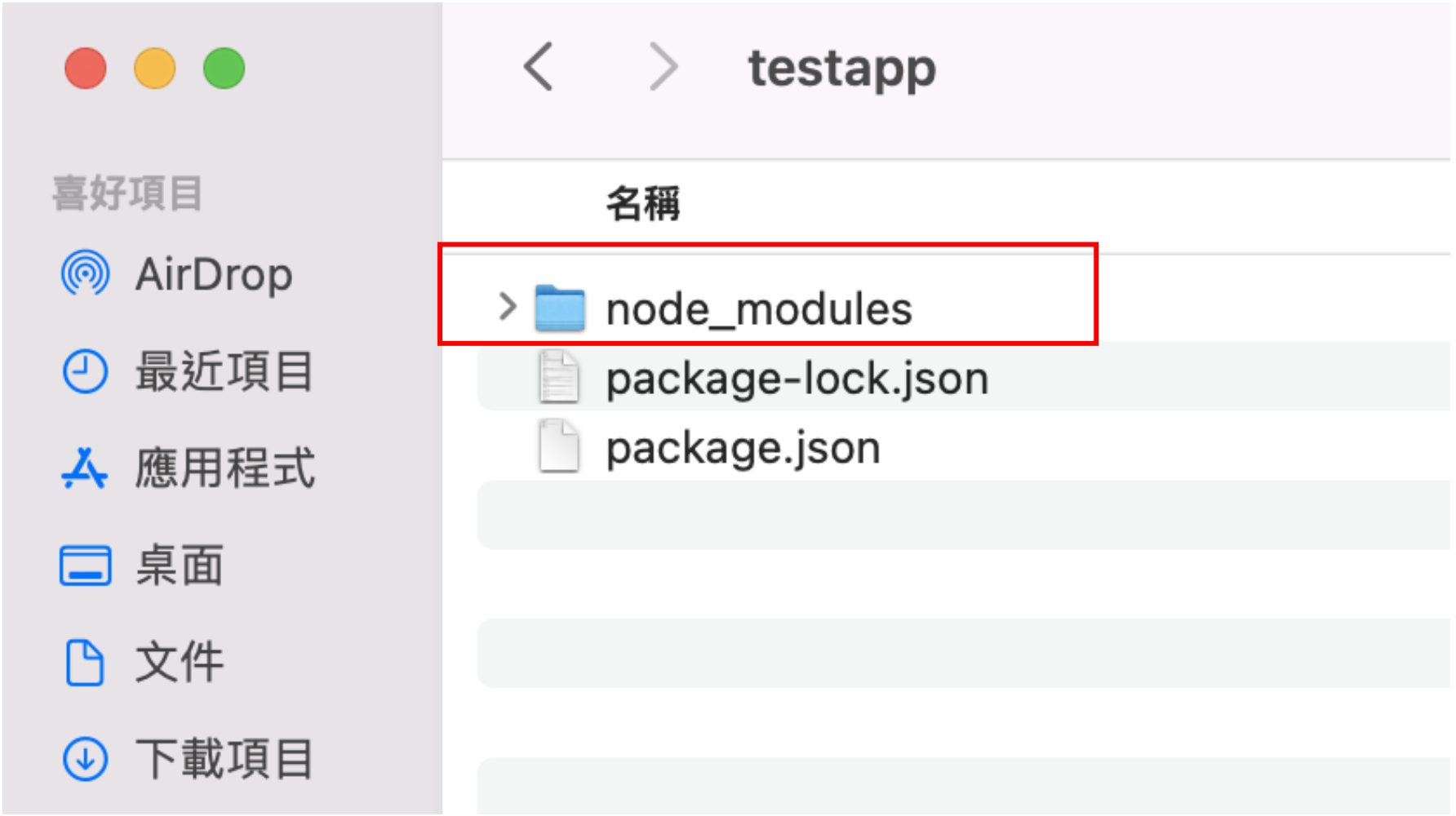
- npm install axios
- npm install vite --save-dev



安裝的套件會記錄在 package.json檔中

```
{
  "name": "testapp",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "dependencies": {
    "axios": "^1.1.3"
  },
  "devDependencies": {
    "vite": "^3.1.8"
  }
}
```

套件程式碼會裝在node_modules資料夾中



練習看看

- 建立一個node.js專案
  - 建立資料夾
  - 產生package.json檔
    - npm init –y
- 在 VS Code 中開啟專案
  - 建立一個index.js檔
  - 透過 node index.js 執行

```
\Documents>cd workspace

\Documents\workspace>mkdir node-project

\Documents\workspace>cd node-project

\Documents\workspace\node-project>npm init -y
```

```
{
"name": "project",
"version": "1.0.0",
"description": "",
"main": "index.js",
"scripts": {
  "test": "echo \"Error: no test specified\" && exit 1"
},
"keywords": [],
"author": "",
"license": "ISC"
}
```

透過 node index.js 執行

- Index.js

```
console.log("Hello Node.js")
```

- 執行 Index.js 檔

```
\workspace\node-project> node index.js
```

- 結果

```
Hello Node.js
```

安裝 axios 套件

```
npm install axios
```

```
"dependencies": {
  "axios": "^1.1.3"
},
```

- 改寫 Index.js 檔並執行看看

```
const axios = require('axios')

axios.get('https://jsonplaceholder.typicode.com/todos/1')
   .then(response => console.log(response.data))
```

```
{ userId: 1, id: 1, title: 'delectus aut autem', completed: false }
```

安裝 json-server 套件

```
npm install json-server --save-dev
```

```
  "dependencies": {
    "axios": "^1.1.3"
  },
  "devDependencies": {
    "json-server": "^0.17.0"
  }
}
```

- 新增 db.json 檔

```
{
  "todos": [
    {
      "id": 1,
      "title": "作業1",
      "completed": false
    },
  ]
}
```

- 啟動 json-server

啟動 json-server 套件

- 啟動 json-server

```
json-server db.json
```

- 改寫 Index.js 並執行看看

```
axios.get('http://localhost:3000/todos')
   .then(response => console.log(response.data))
```

```
\{^_^}/ hi!

Loading db.json
Done

Resources
http://localhost:3000/todos

Home
http://localhost:3000
```

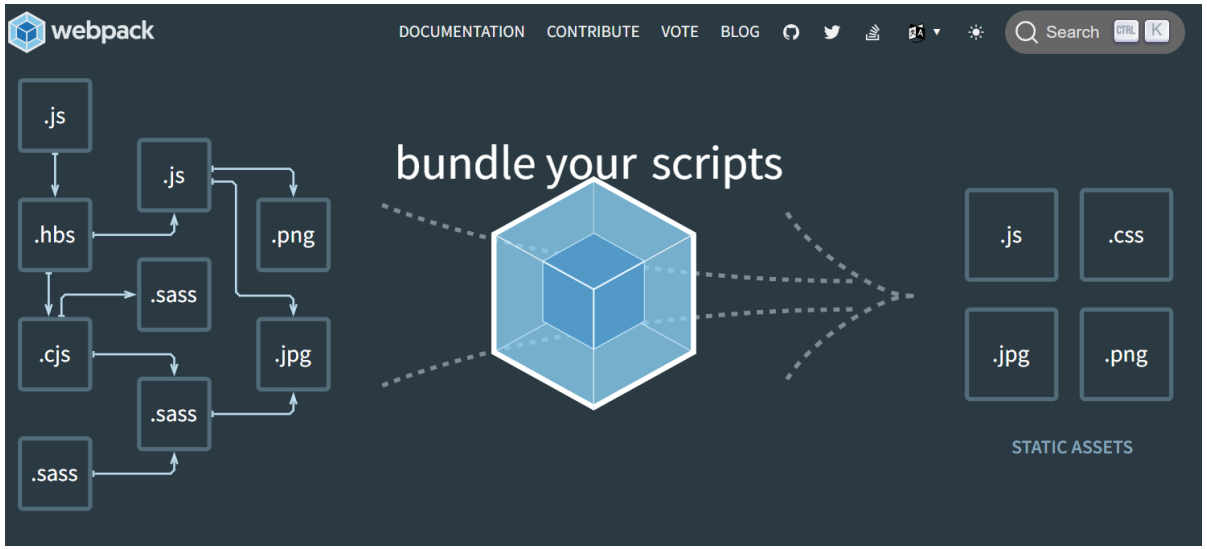
```
[
  { id: 1, title: '作業1', completed: false },
  { id: 2, title: '作業2', completed: true },
  { id: 3, title: '作業3', completed: false }
]
```

建立 Vue Application

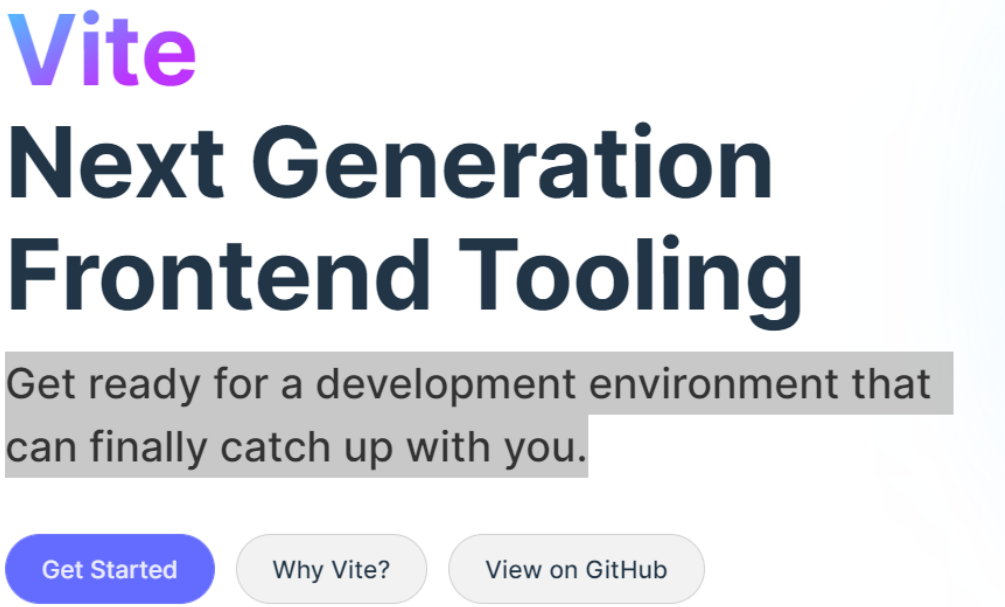
建立 Vue Application

```
> npm init vue@latest
```

- 這段指令會安裝及執行 create-vue
- 專案建置使用新一代的模組打包工具 vite，之前使用的是 webpack



https://webpack.js.org/



https://vitejs.dev/

執行 npm init vue@latest

```
student@iSpan-MacBookPro2017-22 documents % npm init vue@latest

Vue.js - The Progressive JavaScript Framework

✔ Project name:   vue-app
✔ Add TypeScript?   No   Yes
✔ Add JSX Support?   No   Yes
✔ Add Vue Router for Single Page Application development?   No   Yes
✔ Add Pinia for state management?   No   Yes
✔ Add Vitest for Unit Testing?   No   Yes
✔ Add Cypress for both Unit and End-to-End testing?   No   Yes
✔ Add ESLint for code quality?   No   Yes

Scaffolding project in /Users/student/Documents/vue-app...

Done. Now run:

  cd vue-app
  npm install
  npm run dev

student@iSpan-MacBookPro2017-22 documents %
```

安裝及執行 vue 的專案

```
[student@iSpan-MacBookPro2017-22 documents % cd vue-app
[student@iSpan-MacBookPro2017-22 vue-app % npm install

added 33 packages, and audited 34 packages in 5s

4 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
[student@iSpan-MacBookPro2017-22 vue-app % npm run dev

> vue-app@0.0.0 dev
> vite


  VITE v3.1.8  ready in 377 ms

  ➜  Local:   http://127.0.0.1:5173/
  ➜  Network: use --host to expose
```

http://localhost:5173

Vite App

You did it!

You've successfully created a project with Vite + Vue 3.

Documentation

Vue's official documentation provides you with all information you need to get started.

Tooling

This project is served and bundled with Vite. The recommended IDE setup is VSCode + Volar. If you need to test your components and web pages, check out Cypress and Cypress Component Testing.
More instructions are available in `README.md`.

Ecosystem

Get official tools and libraries for your project: Pinia, Vue Router, Vue Test Utils, and Vue Dev Tools. If you need more resources, we suggest paying Awesome Vue a visit.

Community

Got stuck? Ask your question on Vue Land, our official Discord server, or StackOverflow. You should also subscribe to our mailing list and follow the official @vuejs twitter account for latest news in the Vue world.

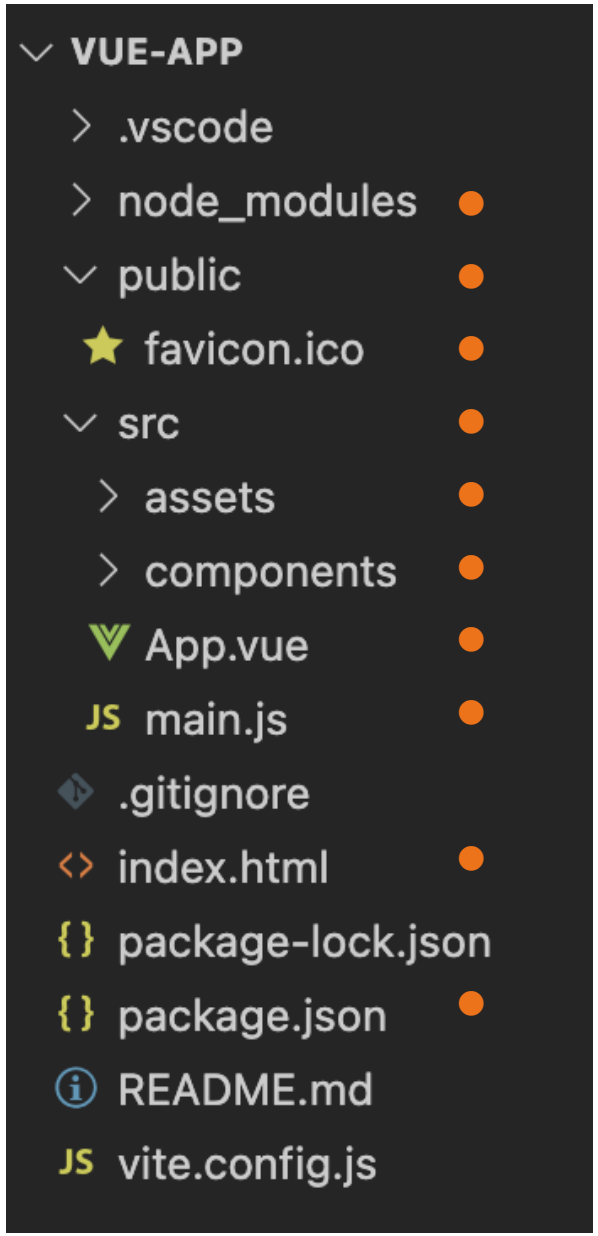
Support Vue

vue 專案的 Package.json

```
{
  "name": "vue-app",
  "version": "0.0.0",
  ▷ 偵錯
  "scripts": {
    "dev": "vite",
    "build": "vite build",
    "preview": "vite preview --port 4173"
  },
  "dependencies": {
    "vue": "^3.2.38"
  },
  "devDependencies": {
    "@vitejs/plugin-vue": "^3.0.3",
    "vite": "^3.0.9"
  }
}
```

```
15    "dependencies": {
16      "pinia": "^2.0.21",
17      "vue": "^3.2.38",
18      "vue-router": "^4.1.5"
19    },
20    "devDependencies": {
21      "@rushstack/eslint-patch": "^1.1.4",
22      "@types/jsdom": "^20.0.0",
23      "@types/node": "^16.11.56",
24      "@vitejs/plugin-vue": "^3.0.3",
25      "@vitejs/plugin-vue-jsx": "^2.0.1",
26      "@vue/eslint-config-prettier": "^7.0.0",
27      "@vue/eslint-config-typescript": "^11.0.0",
28      "@vue/test-utils": "^2.0.2",
29      "@vue/tsconfig": "^0.1.3",
30      "cypress": "^10.7.0",
31      "eslint": "^8.22.0",
32      "eslint-plugin-cypress": "^2.12.1",
33      "eslint-plugin-vue": "^9.3.0",
34      "jsdom": "^20.0.0",
35      "npm-run-all": "^4.1.5",
36      "prettier": "^2.7.1",
37      "start-server-and-test": "^1.14.0",
38      "typescript": "~4.7.4",
39      "vite": "^3.0.9",
40      "vitest": "^0.23.0",
41      "vue-tsc": "^0.40.7"
```

Vue 專案結構



套件程式碼放在這裡

公開檔案資料夾

原始檔資料夾，vue的程式都在這裡

vue用的靜態檔案資料夾

元件預設都放在這裡

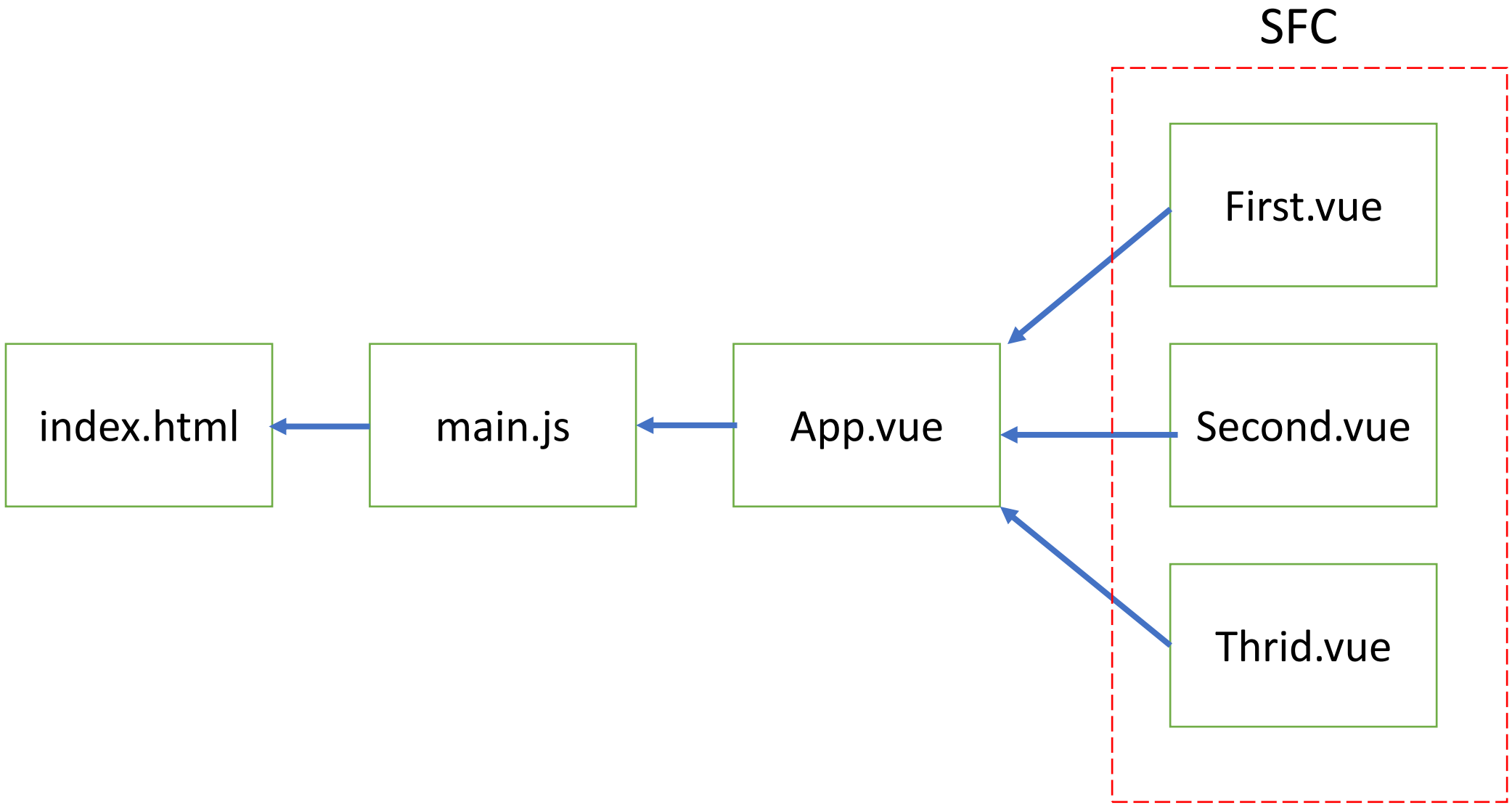
主要整合Vue元件的檔案

載入 App.vue 的內容掛載到 index.html

vue 專案的唯一 HTML 文件(Single Page Application)

紀錄 vue 專案安裝了那些套件，專案的執行方式等地專案資訊

網站結構



Single-File Component(SFC)

- Script

```
<script setup></script>
```

- template

```
<template>
 <h1>My First Vue Component</h1>
</template>
```

- style

```
<style scoped></style>
```

Compoent的建立

Components/HelloVue.vue

```
<script setup>
    import { ref } from "vue"
    const msg = ref('')
</script>
```

```
<template>
  <h3>Hello, {{ msg }}!!</h3>
  <input type="text" v-model="msg" />
</template>
```

```
<style scoped>
  h3{  color:blue; }
</style>
```

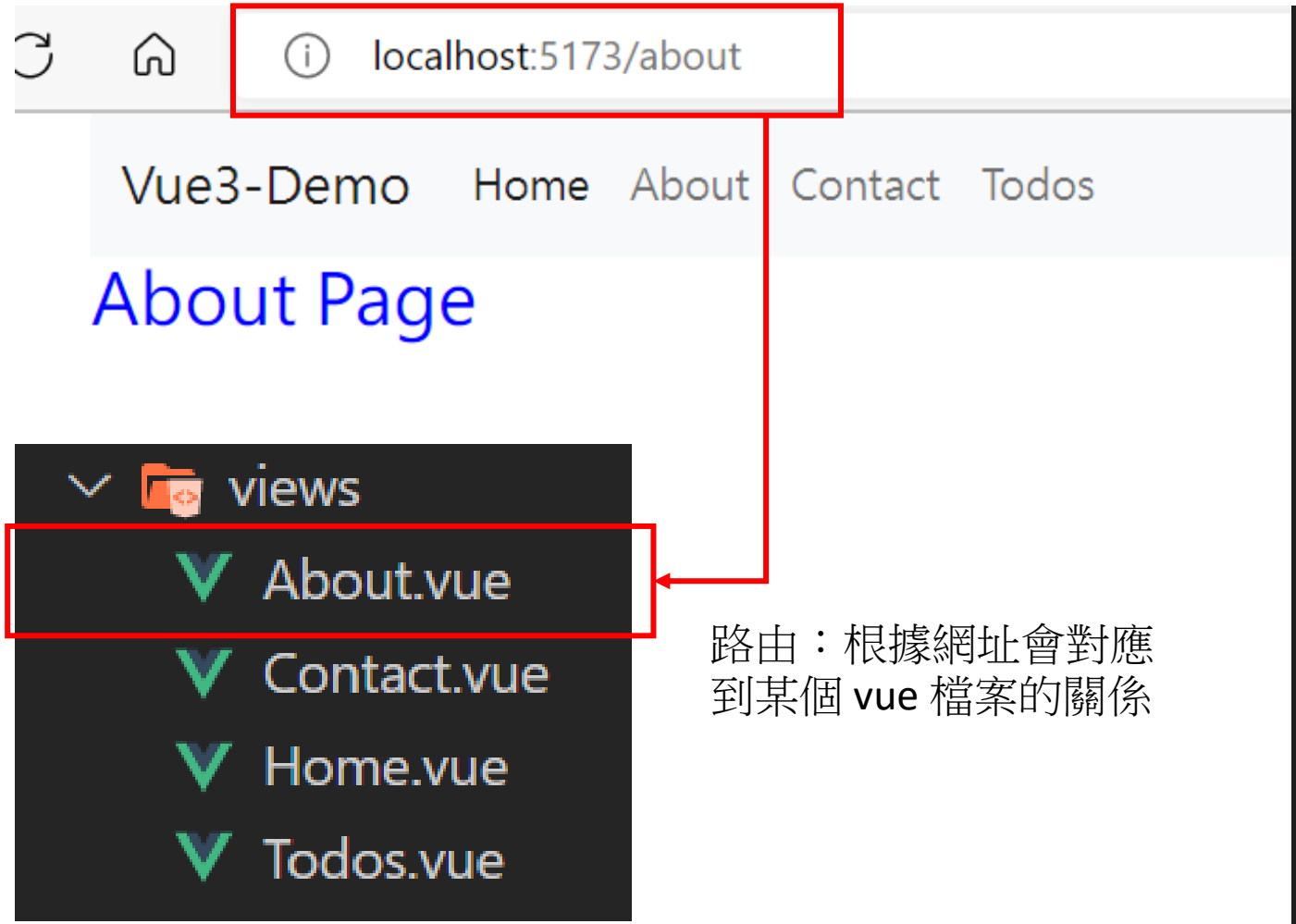
Component 的使用

App.vue

```
<script setup>
    import HelloVue from '@/components/HelloVue.vue'
</script>
```

```
<template>
    <HelloVue />
    <hello-vue></hello-vue>
</template>
```

路由 vue-router



路由：根據網址會對應到某個 vue 檔案的關係

```
src > views > Home.vue > ...
1   <template>
2       <h3>Home Page</h3>
3   </template>
4
5   <script setup>
6
7   </script>
8
9   <style scoped>
10
11  </style>>
12
13
```

路由設定及使用

- 安裝路由套件

```
npm install vue-router@4
```

- <router-view> Vue Component 會顯示的地方
- <router-link> 產生超連結的標籤

App.vue

```
<template>
  <router-link to="/">Home</router-link>
  <router-link to="/about">About</router-link>
  <hr />
  <router-view />
</template>
```


官方文件：https://router.vuejs.org/

在JS檔中設定路由

router.js

```
import { createWebHistory, createRouter } from "vue-router";
import Home from "@/views/Home.vue";
import About from "@/views/About.vue";
const routes = [
  {
    path: "/",   http://localhost:5174/
    name: "Home",
    component: Home,
  },
  {
    path: "/about", http://localhost:5174/about
    name: "About",
    component: About,
  },
];
```

router.js

```
const router = createRouter({
  history: createWebHistory(),
  routes,
});

export default router;
```

官方文件：https://router.vuejs.org/

套用路由

main.js

```
import { createApp } from 'vue'
import App from './App.vue'
import router from './router'

// createApp(App).mount('#app')
createApp(App).use(router).mount('#app')
```

官方文件：https://router.vuejs.org/

改寫 Todo


Todos.vue
Todos
想要做甚麼?
作業 1
作業 2
作業 3
TodoList.vue
尚有？個工作未完成
TodoFooter.vue
清除完成工作

資料的傳遞(父 > 子)

Parent Component

Child Component

App.vue

```
<script setup>
  import HelloVue from '@/components/HelloVue.vue'
</script>

<template>
  <HelloVue />
  <hello-vue />
</template>
```

App.vue 父組件

```
<script setup>
  import HelloVue from '@/components/HelloVue.vue‘
  import { ref } from "vue"
  let message = ref('Hello, Vue');
</script>

<template>
  <HelloVue  :data="message" />
</template>
```

HelloVue.vue 子組件

```
<script setup>
  const props = defineProps({
    data: String,
  });
</script>

<template>
  <h3>{{ data }}!!</h3>
  <input type="text" v-model=“data" />
</template>
```

Hello, Vue!!

Hello, Vue

父-傳遞 todos 資料到子組件

Todos.vue

```
<script setup>
   import { reactive, ref } from "vue";
   const todos = reactive({
   "data": [
      { "id": 1, "title": "作業1", "completed": false },
      { "id": 2, "title": "作業2", "completed": true },
      { "id": 3, "title": "作業3", "completed": false }]
})
</script>
```

```
<template>
   <TodoList :todos="todos.data"  />
</template>
```

子-接收及顯示 todos 資料

TodoList.vue

```
<script setup>
const props = defineProps({
   todos: Array
})
</script>
```

```
<template>
    <li v-for="(todo,index) in props.todos" class="list-group-item" :key="index">
        <div class="d-flex justify-content-between">
            <div>
                <input class="form-check-input me-3" type="checkbox">
                <label class="form-check-label">{{todo.title}}</label>
            </div>
            <button class="badge bg-danger rounded-pill">X</button>
        </div>
      </li></template>
```

Todos 資料新增

Todos.vue

```
<script setup>
   import { reactive, ref } from "vue";
   const newTodo = ref(‘’)
   const addTodo = () => {
      if (!newTodo.value) {
         return;
      }
   todos.data.push({ "id": todos.data.length + 1, "title": newTodo.value, "completed": false });
   newTodo.value = '';
}</script>
```

```
<template>
   <input type=“text” v-model.trim="newTodo" class=“form-control” autofocus autocomplete=“off”
         placeholder="想要做甚麼?"  @keyup.enter="addTodo" />
</template>
```

父 - 刪除todo資料

Todos.vue

```
<script setup>
const removeTodo = todo => {
    const index = todos.data.indexOf(todo);
    todos.data.splice(index, 1);
}
</script>
```

```
<template>
    <TodoList :todos="todos" @removeTodo="removeTodo" />
</template>
```

子 – 刪除 todo資料

TodoList.vue

```
<script setup>
   const emit = defineEmits(["removeTodo"])
   const handleRemove = todo => {
      emit("removeTodo", todo)
   }
</script>
```

```
<template>
    <button @click="handleRemove(todo)"
                                    class="badge bg-danger rounded-pill">X</button>
</template>
```

勾選完成的 todo

TodoList.vue

```
<div class="d-flex justify-content-between">
   <div>
      <input v-model="todo.completed" class="form-check-input me-3" type="checkbox">
      <label v-bind:class="{ completed: todo.completed }" class="form-check-label">{{todo.title}}</label>
    </div>
    <button @click="handleRemove(todo)" class="badge bg-danger rounded-pill">X</button>
</div>
```

```
<style scoped>
   .completed {
      color: #949494;
      text-decoration: line-through;
   }
</style>
```

將 todos 儲存在 localStorage 中

- 從 localStorage 中讀出資料

```
const todos = reactive({ "data": JSON.parse(localStorage.getItem("todos") || '[]') })
```

- 將資料儲存在 localStorage 中

```
watch(() => todos, (newValue, oldValue) => {
    localStorage.setItem("todos", JSON.stringify(newValue.data))
},{ deep: true })
```

父 - 計算還有多少 todos 要做

Todos.vue

```
const remaining = computed(() => {
    let activeTodos = todos.data.filter(todo => !todo.completed)
    return activeTodos.length
})
```

```
<TodoFooter  :remaining="remaining" />
```

子 - 計算還有多少 todos 要做

TodoFooter.vue

```
<script setup>
   const props = defineProps({ remaining: Number })
</script>
```

```
<template>
   <div class="mt-3 d-flex justify-content-between">
      <strong class=" me-3">尚有 {{props.remaining}} 個工作未完成</strong>
      <button  class="btn btn-warning me-3">清除完成工作</button>
   </div>
</template>
```

父 - 清除所有完成的 todos

Todos.vue

```
const removeComplete = () => {
    for (let i = todos.data.length - 1; i >= 0; i -= 1) {
        if (todos.data[i].completed) {
            todos.data.splice(i, 1);
        }
    }
}
```

```
<TodoFooter @removeComplete="removeComplete" :remaining="remaining" />
```

子 - 清除所有完成的 todos

TodoFooter.vue

```
<script setup>
const props = defineProps({ remaining: Number })
const emit = defineEmits(["removeComplete"])
const handleRemoveComplete = () => {
    emit("removeComplete")
}
</script>
```

```
<template>
    <div class="mt-3 d-flex justify-content-between">
        <strong class=" me-3">尚有 {{props.remaining}} 個工作未完成</strong>
        <button @click="handleRemoveComplete" class="btn btn-warning me-3">清除完成工作</button>
    </div>
</template>
```

todos 資料修改 - template

- 顯示畫面

TodoList.vue

```
<div v-if="editedTodo !== todo" class="d-flex justify-content-between align-items-center">
  <div>
    <input v-model="todo.completed" class="form-check-input me-3" type="checkbox">
    <label v-bind:class="{ completed: todo.completed }" @dblclick="editTodo(todo)"
           class="form-check-label"> {{todo.title}} </label>
    </div>
    <button @click="removeTodo(todo)" class="badge bg-danger rounded-pill">X</button>
</div>
```

- 編輯畫面

```
<input v-else type="text" v-model="todo.title" class="form-control" @blur="doneEdit(todo)"
@keyup.enter="doneEdit(todo)" @keyup.escape="cancelEdit(todo)">
```

todos 資料修改 - script

TodoList.vue

```
import { ref, watch } from 'vue'
const editedTodo = ref(null)
const beforeEditCache = ref('')
const editTodo = todo => {
    beforeEditCache.value = todo.title
    editedTodo.value = todo
}
const cancelEdit = todo => {
    editedTodo.value = null
    todo.title = beforeEditCache.value
}
const DoneEdit = todo => {
    todo.title = todo.title.trim()
    editedTodo.value = null
}
```

iSpan
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Thank you