JS Notebook v0.1

test.jsnb

Save + D Comb Split List unList export

1 JavaScript Essentials

1.1 Where to place the JS Code?

1.1.1 inline

不建議使用，但要知道有這種方式，課程後半段的 vue 會有大量類似的寫法，但和 inline 有著本質的不同

```
<a href="#" onclick="alert('hello'); return false;">Greeting</a>
<a href="javascript: alert('hello');">Greeting2</a>
```

1.1.2 internal

使用 `<script>` 包裹的 JS code

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
  <script>
    alert('this is 1')
  </script>
</head>
<body>
  <script>
    alert('this is 2')
  </script>
</body>
</html>
```

1.1.3 external

獨立的 JS 檔案，使用 `<script src="/path/to/x.js">` 的方式引用

```
.
├── index.html
```

```
└── js
    └── app.js
```

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <script type="module" src="/js/app.js"></script>
    <meta charset="UTF-8">
    <link rel="icon" href="/favicon.ico">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Just Notebook</title>
  </head>
  <body>
    <div id="app"></div>
    <script src="/js/app.js"></script>
  </body>
</html>
```

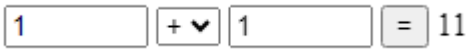
1.1.4 type="module"

1.1.5 defer

1.1.6 CDN

1.2 變量 Variables

1.2.1 為什麼需要變量？



body of index.html

```
<input type="number" id="a" />
<select id="operator">
  <option value="+">+</option>
  <option value="-">-</option>
  <option value="*">*</option>
  <option value="/">/</option>
</select>
<input type="number" id="b" />
<button>=</button>
<span id="result"></span>
```

internal script

```
function calc() {
  const inputA = document.querySelector("#a");
```

```
  const inputB = document.querySelector("#b");
  const operator = document.querySelector("#operator");
  const result = document.querySelector("#result");

  const a = inputA.value;
  const b = inputB.value;
  const op = operator.value;

  if (op === "+") {
    result.innerText = a + b;
  }

  if (op === "-") {
    result.innerText = a - b;
  }

  if (op === "*") {
    result.innerText = a * b;
  }

  if (op === "/") {
    result.innerText = a / b;
  }
}

const btn = document.querySelector("button");
// btn.onclick = calc;
btn.addEventListener("click", calc);
```

1.2.2 let & const

```
var a // 舊寫法，不建議使用

let a // 聲明一個會被改變的變量, 此時 a 是 'undefined'
a = 1 // ok
a = 2 // ok
let a // Uncaught SyntaxError: Identifier 'a' has already been declared

//「常量」
const a // Uncaught SyntaxError: Missing initializer in const declaration
const a = 1 // ok
a = 2 // not ok, Uncaught TypeError: Assignment to constant variable.
```

Scope

```
let a = 100;

function a() {
  console.log(a); // => 100
  let b = 200;
}
```

```
console.log(b); // => error
```

1.3 數據類型 Data Types

- number
- string
- boolean
- null
- undefined

1.3.1 number

```
1
1.0
0.1
.1
-0.1
1e-4 // 1/1000
2 ** 1024 // => Infinity
Number.MAX_SAFE_INTEGER // => 2 ** 53 - 1
```

1.3.2 string

使用引號括住，單引號、雙引號、反斜引號 3種符號都表示字串

```
'hello'
"hello"
'hello "John"'
"someone's package"
'someone\'s package'

`hello, I can use both 'a' and "b"`
```

1.3.3 boolean

```
true
false
```

1.3.4 undefined

```
let a // a => undefined
```

1.3.5 null

```
let a = null
```

1.4 類型轉換 Data Type Conversion

1.4.1 number 轉 string

```
String(100);
(100).toString() // 要加 () 包住 number
100 + ''
```

最常用的是 +"100"

1.4.2 string 轉 number

```
parseInt("100"); // => 100
parseInt("100a") // => 100
parseInt("a100") // => NaN

Number("100") // => 100
Number("a100") // => NaN


parseInt("10101010", 2) // => 170
```

複雜字串中分析數值要用到正則表達式

```
"this is a string: 101.1".match(/([\d|\.]+)/);
// => ['101.1', '101.1', index: 7, input: 'float: 101.1', groups: undefined]
```

1.5 運算符 Operators

```
1 + 2           // => 2
1 - 2           // => -1
1 * 2           // => 2
1 / 2           // => 0.5
2 ** 3          // => 8
10 % 3          // => 1
```

簡寫

```
x = x + 1

// 3 種簡寫
// 1: x += 1
// 2: x++
```

```
// 3: ++x

console.log(x++)        // => output 1, x = 2
console.log(++x)        // => output 3, x = 3
```

常用計算方法都可以簡寫：

```
x += 1
x -= 1
x *= 1
x /= 1
x %= 1
```

判斷運算符

```
1 == true       // => true
"1" == true     // => true
1 == "1"        // => true

1 === true      // => false
1 === "1"       // => false
1 === 1         // => true
```

不同數據類型的運算

```
1 + null        // => 1
1 + true        // => 2
1 + "1"         // => 11, not 2!

// 可以省去前面的數字，用 + 將其他數據類型轉為數字
+null           // => 0
+true           // => 1
+"1"            // => 1

"hello" + true          // "hellotrue"
"hello" + null          // "hellonull"
"hello" + undefined     // => "helloundefined"

// 用空字符將其他類型轉換為字符串
'' + true       // => 'true'
'' + null       // => 'null'
'' + undefined  // => 'undefined'
'' + 123        // => '123'

// 一些特殊例子
1 / 0           // => Infinity
1 / "2"         // => 0.5
1 / "hello"     // => NaN
```

1.6 條件判斷 Conditions

```
if (a > 10) {
    alert('a greater than 10')
}
```

當執行語句只有一句，即 表達式（expression） 時，可以省略 {}

```
if (a > 10) alert('a greater than 10')
```

```
if (a > 10) {
    alert ('a greater than 10')
} else if (a > 20) {
    alert('a greater than 20')
} else if (a > 30) {
    alert('a greater than 30')
} else {
    alert('?')
}
```

條件運算符

```
if (a > 10) {
    alert('a greater than 10')
} else {
    alert('a less or equals to 10')
}
```

```
const m1 = 'a greater than 10'
const m2 = 'a less or equals to 10'
const msg = a > 10 ? m1 : m2
alert(msg)
```

```
a > 10 ? alert('a greater than 10') : alert('a less or equals to 10')

// or
alert(a > 10 ? 'a greater than 10' : 'a less or equals to 10')
```

switch & case

```
switch(a) {
  case 10
    alert('a is 10')
    break
  case 20:
```

```
    alert('a is 20')
    break
  default
    alert('unknown')
}
```

1.7 循環 Loop

1.7.1 for

```
for(let i = 0; i < 100; i++) {
    console.log(i)
}
```

1.7.2 while

```
let i = 0
while (i < 10) {
  console.log("The number is " + i)
  i++
}
```

1.7.3 break

中斷並離開循環

1.7.4 continue

取消一步中後續的代碼，立即開始循環中的下一步

1.8 Function

1.8.1 function declaration

```
function hello() {
    alert('hello world')
}
```

function expression

```
const hello = function() {
    alert('hello')
}
```

1.8.2 call the function

```
hello()
```

1.8.3 local & outer variables

```
const greeting = 'good morning'

function sayHi(user) {
    alert(greeting + ' ' + user)
}
```

1.8.4 parameters & default values

```
function hello(userName = 'daniel') {
    alert('hello there! ' + userName)
}
```

1.8.5 return value

```
function add(a, b) {
    return +a + +b
}

const x1 = add(1, 2)            // => 3
const x2 = add("1", 2)          // => 3
const x3 = add(1, "2")          // => 3
const x4 = add("1", "2")        // => 3
```

1.8.6 callback

```
function greeting() {
    alert("hello there")
}

setTimeout(greeting, 1000)
```

1.9 DOM tree

1.9.1 find elements

```
document.querySelector('title')
document.querySelectorAll('a')
```

1.9.2 bind events

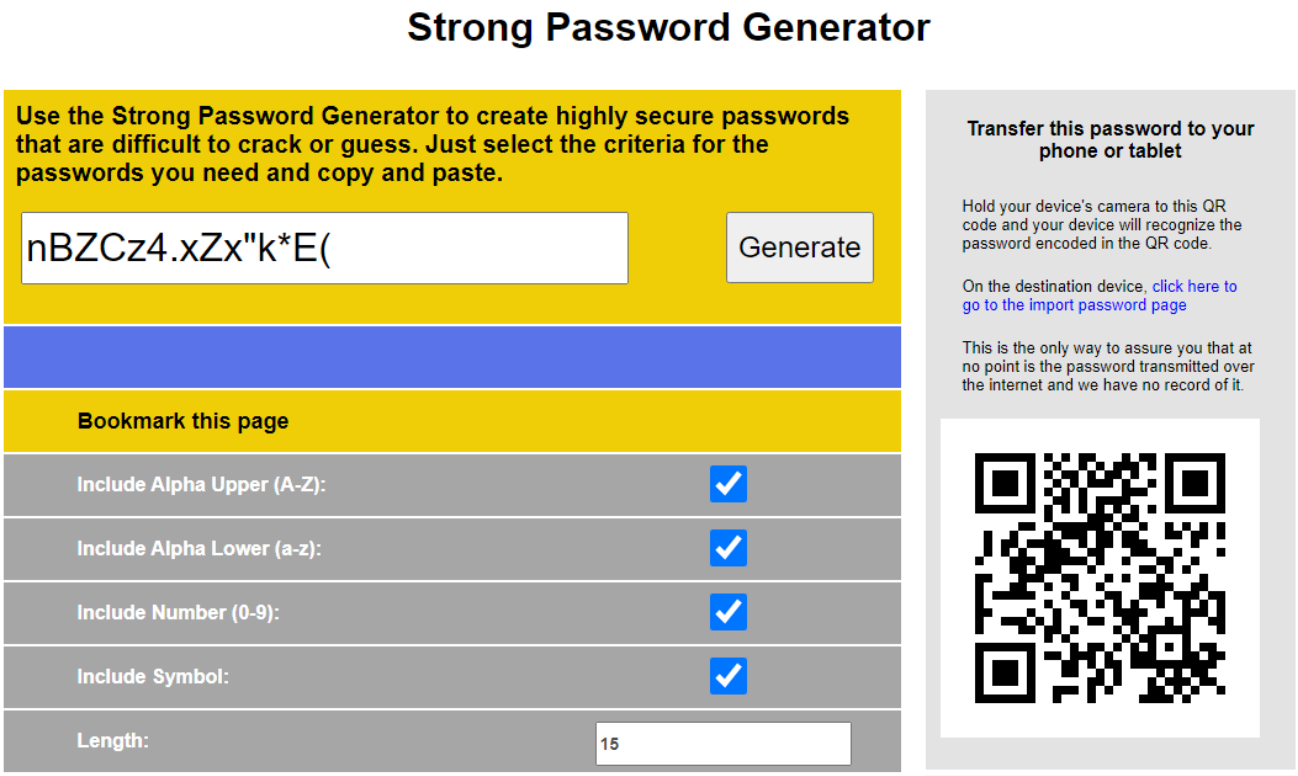
```
const el = document.querySelector('button')

function onBtnClick() {
    alert('btn been clicked!')
}

// el.onclick = onBtnClick
el.addEventListener('click', onBtnClick)
```

1.10 練習

1.10.1 JS 計算器

1.10.2 Draggable Box

1.10.3 Strong Password Generator



1.11 課外閱讀

https://javascript.info/
The Modern JavaScript Tutorial

https://es6.ruanyifeng.com/
ES6 入门教程