JavaScript Introduction

國立屏東大學

電腦科學與人工智慧學系

咪路 **<mail@mirumo.org />**
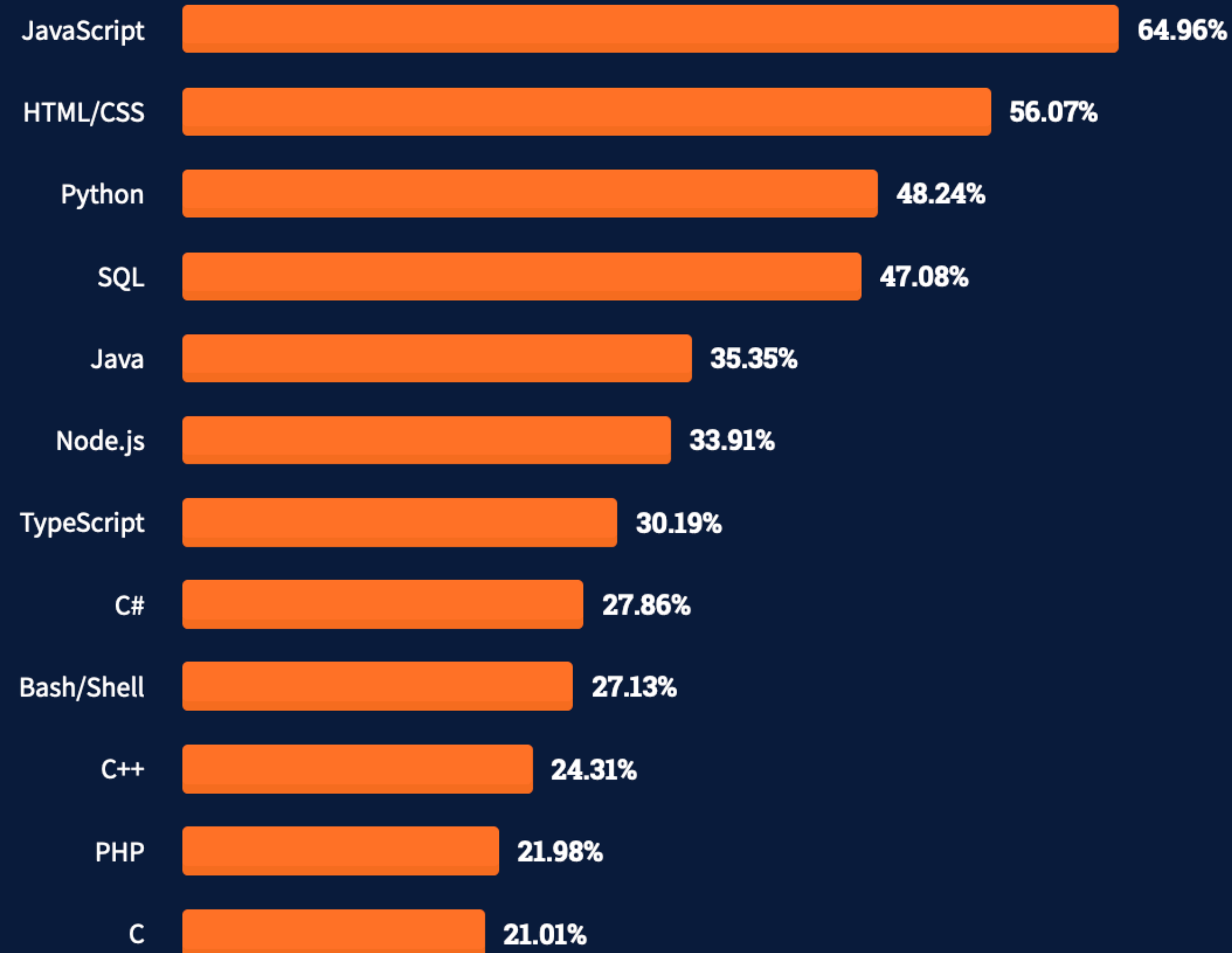
What is JavaScript?

The Most Popular Program Language
According to Stack Overflow 2021 Developer Surery….

Language	Percentage
JavaScript	64.96%
HTML/CSS	56.07%
Python	48.24%
SQL	47.08%
Java	35.35%
Node.js	33.91%
TypeScript	30.19%
C#	27.86%
Bash/Shell	27.13%
C++	24.31%
PHP	21.98%
C	21.01%

- High-level

- Dynamic typing

- Object-orientation

- Prototype-based Programming

客戶：這是個很簡單的工作，
任何人可以在5分鐘內做完

設計師：那你做啊

客戶：

來源：I am Programmer, I have no life　　　　　　譯：卡

What Can We Do With JavaScript?

- Web Application

- Mobile Applications

- Real-time Networking Applications

- Command-line Tools

- Games

Where does JavaScript run?

In Browser…
JavaScript Engine

- FireFox: SpiderMonkey

- Chrome: v8

- Safari: JavaScriptCore

Node.js

In 2009, Ryan Dahl released a open-source project.

He took the JavaScript engine in chrome and embedded it inside C++ Process.

封城的話你就有時間可以休息了

我是軟體工程師

來源：I am Programmer, I have no life

ECMAScript

What is ECMAScript?
JavaScript Standard

ECMAScript is a JavaScript standard intended to ensure the interoperability of web pages across different browsers.

It is standardized by Ecma International in the document ECMA-262.

From Wikipedia

- Version1 - release in 1997

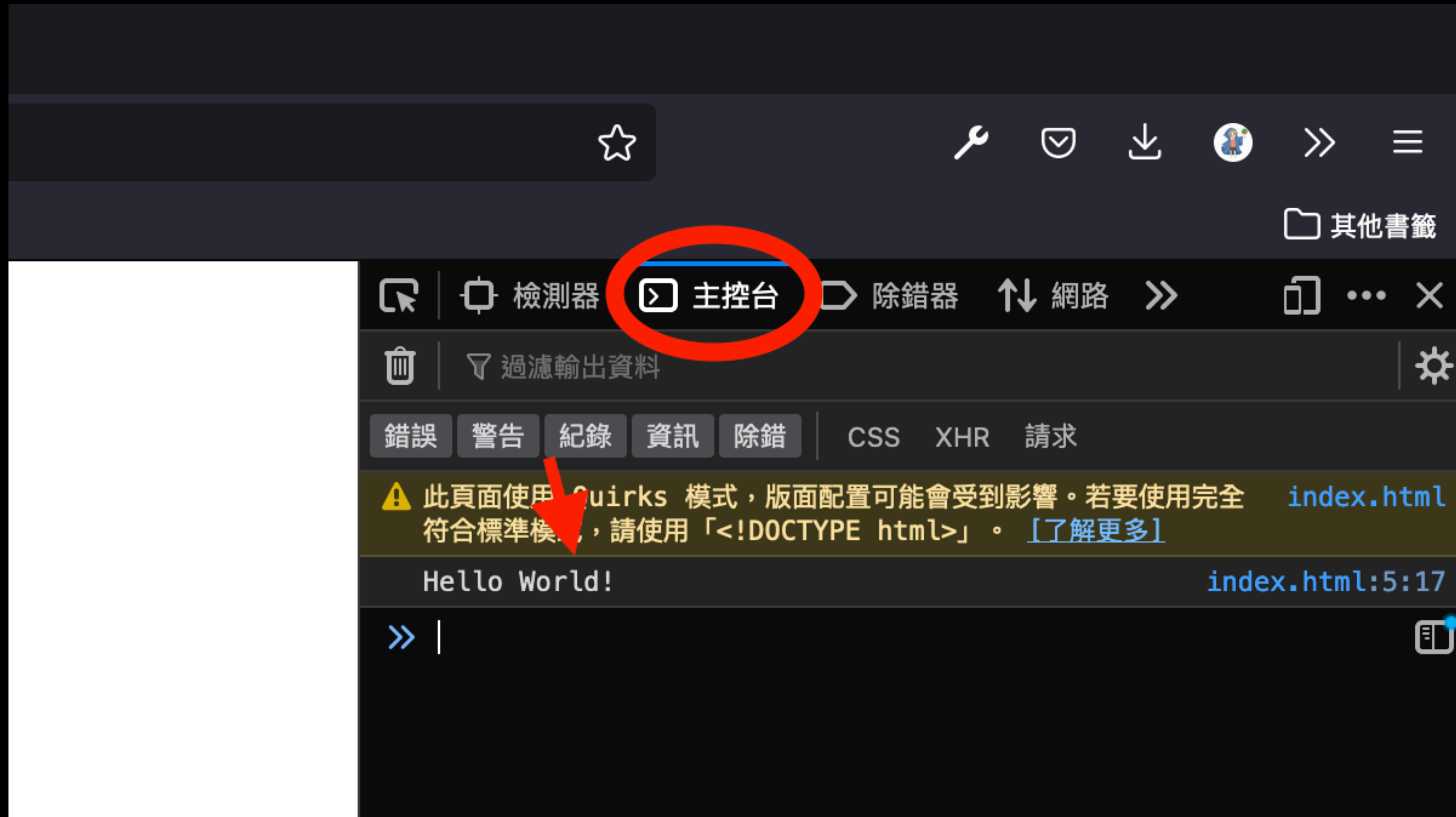- ES5 - ECMAScript 2009

- ES6 - ECMAScript 2015

First JavaScript Code

Try It…
Run JavaScript in Browser

```
1 <html>
2     <head>
3         <script>
4             console.log("Hello JavaScript!");
5         </script>
6     </head>
7     <body></body>
8 </html>
9
~
~
~
~
~
~
~
~
~
~
~
~
~
"index.html" 9L, 138B written                              9,0-1        All
```

View JavaScript Console in Browser

Comment in JavaScript

```
 1 <!DOCTYPE html>
 2 <html>
 3   <head>
 4     <meta http-equiv="content-type" content="text/html; charset=utf-8" />
 5
 6     <title>Index</title>
 7     <script>
 8       // This is comment.
 9
10       /*
11         This is mulit-line comment.
12       */
13     </script>
14   </head>
15   <body></body>
16 </html>
17
```

External JavaScript

```html
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <meta http-equiv="content-type" content="tex
5
6     <title>Index</title>
7     <script src="path"></script>
8   </head>
9   <body></body>
10 </html>
11
```

Variables

Naming Variables

- Uppercase and lowercase alphabet (a~z, A~Z)

- Number(0~9)

- Underscore or dollar sign (_, $)

- The first character can not be number.

- Variable names can not be key works.

- Variable name can not include a mathematical or logical operator and space.

```
1 var a = 12;
2 let b = 'Hello world'
3
```

```
1  if (true) {
2      var x = 2;
3      let y = 3;
4  }
5
6  console.log(`x is ${x}`);
7  console.log(`y is ${y}`);
8
```

```
1  const x = 12;
2
3  x = 100; // ! Error
4
5  if (true) {
6      const y = 12;
7  }
8
9  console.log(y) // undefined
10
```

Data Type

- String

- Number (12 , 3.14 , NaN)

- Boolean (true , false)

- Object

- Function

- Untyped (null , undefined)

```javascript
1 let x = 'Hello World'; // String
2
3 let a = 12; // Number
4 let b = 3.14; // Number
5 let c = NaN; // Number
6
7 let t = true; // Boolean
8 let f = false; // Boolean
9
10 let arr = ['javascrip', 1]; // Object
11 let obj = { a: 12, b: 3.14 } // Object
12
13 function foo() { return 'js'; } // Function
14 let temp = function() { return 'js' } // Function
15
```

Object

```
1 let arr = ['Hello', true, 1024, ['js']]
2 let obj = { name: 'mirumo', age: 18, depart: 'cs' }
3
```

```
1 console.log(arr[0]);
2 console.log(obj.name);
3 console.log(obj['age']);
```

Operators

Math Operators

Oper	Description
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Modulus (Division Remainder)

Oper	Description
**	Exponentiation
++	Increment
--	Decrement

Assignment Operators

- +=

- -=

- *=

- /=

- %=

- **=

x += y	x = x + y
x -= y	x = x - y
x *= y	x = x * y
x /= y	x = x / y
x **= y	x = x ** y

Bitwise Operators

Oper	Description
&	AND
|	OR
^	XOR
~	NOT

Oper	Description
<<	Left shift
>>	Right shift
>>>	Unsigned right shift

Comparison Operators

Oper	Description
==	Equal to
===	Equal and same type
!==	Not equal to
!===	Not equal or same type

Oper	Description
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

Logical Operators

Oper	Description
&&	Return true, if both operands are true
||	Return true, if one of the operands is true
!	Return true, if the operand is false, and false, if the operand is true

Conditionals

If statement

```
1 if (conditional) {
2       // do somethings
3 }
4
```

If else statement

```
1 if (conditional) {
2     // do somethings
3 } else {
4     // do somethings
5 }
6
```

Switch statement

```
1  switch (value) {
2       case one:
3              // do something
4              break;
5       case two:
6              // do something
7              break;
8       case three:
9              // do something
10             break;
11      default:
12             // do something
13  }
14
```

Loops

while loops

```
1  let i = 0;
2  while (i < 10) {
3      console.log(i ** 2);
4  }
5
```

for loops

```
1 for (let i = 0; i < 10; ++i) {
2     console.log(i ** 2);
3 }
4
```

for in loops

```javascript
let info = { name: 'mirumo', age: 18 };

for (let i in info) {
    console.log(i);
}

// output:
// name
// age
```

for of loops

```javascript
let info = { name: 'mirumo', age: 18 };

for (let i of info) {
    console.log(i);
}

// output:
// mirumo
// 18
```

Break and Continue

```
1 for (let i=0; i<10; ++i) {
2     if (i % 2) continue;
3     if (i === 6) break;
4 }
5
```

咪路 <mail@mirumo.org />