



Web Development Fundamentals

TypeScript 基础

Intro to TypeScript

Jun 2021

Microsoft Reactor | Ryan Chung

```
led by player to  
s.load_image("kg.png")  
  
(self):  
    initialize Dog object and create Text o  
g, self).__init__(image = Dog.image,  
                    x = games.mouse.x,  
                    bottom = games.screen.  
score = games.Text(value = 0, size = 24,  
                     top = 5, right = game  
screen.add(self.score)  
1 = games.Text(value = 0, size = 24,  
                 top = 5, left = game
```



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Reactor



developer.microsoft.com/reactor/
[@MSFTReactor](#) on Twitter



TypeScript 入门

36 分钟 • 模块 • 8 单元

★★★★★ 4.8 (87)

初级

开发人员

学生

Visual Studio Code

本模块将介绍 TypeScript 语言、创建它的原因，以及如何将其用于 JavaScript 开发。你还将设置一个 TypeScript 开发环境，供日后练习。

学习目标

在本模块中，你将：

- 了解在 Web 开发中 TypeScript 相比 JavaScript 的改进。
- 选择一个 TypeScript 编辑器。
- 安装 TypeScript。
- 在 Visual Studio Code 中设置 TypeScript 项目。

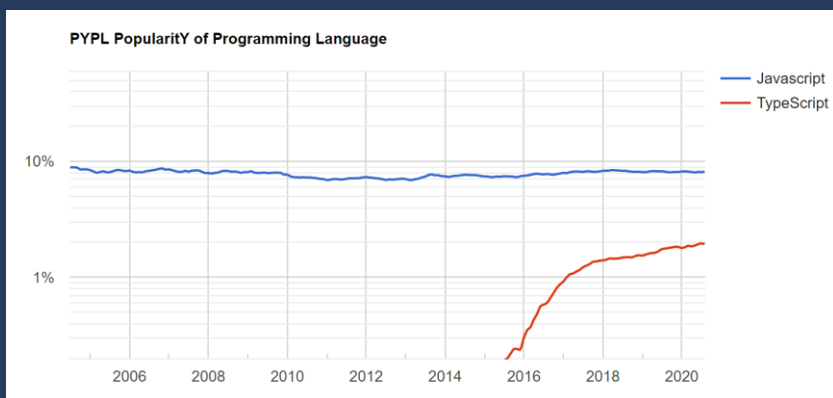
先决条件

- JavaScript 知识

学习目标

- 了解TypeScript对于JavaScript的改进部分
- 选择TypeScript编辑器
- 安装TypeScript
- 在VS Code中设定TypeScript专案

TypeScript 简介



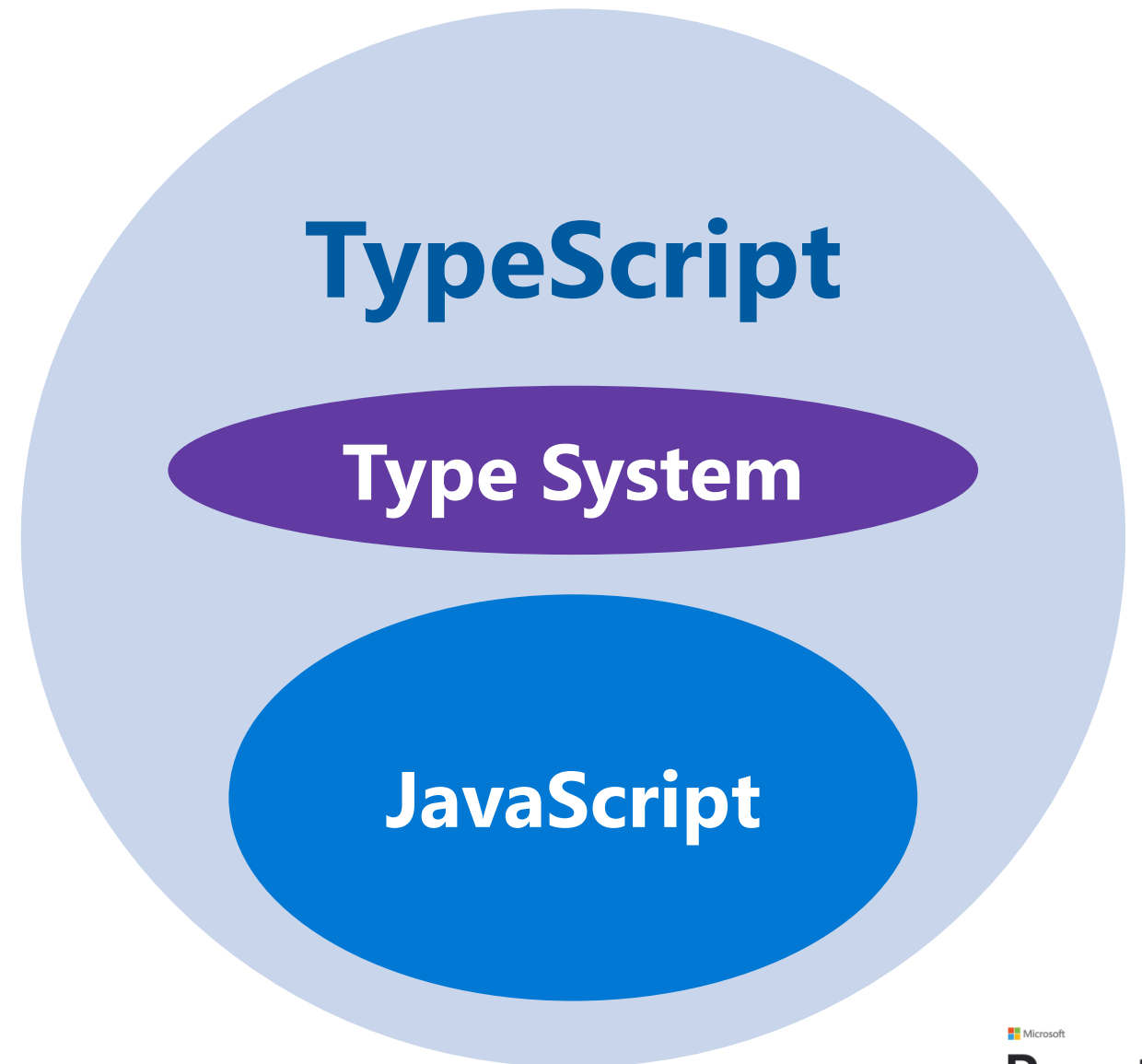
Worldwide, Apr 2021 compared to a year ago:

Rank	Change	Language	Share	Trend
1		Python	29.5 %	-1.0 %
2		Java	17.51 %	-0.6 %
3		JavaScript	8.19 %	+0.2 %
4		C#	7.05 %	-0.2 %
5	↑	C/C++	6.73 %	+1.0 %
6	↓	PHP	6.23 %	+0.0 %
7		R	3.86 %	+0.0 %
8		Objective-C	2.77 %	+0.3 %
9	↑	TypeScript	1.87 %	-0.0 %
10	↓	Swift	1.85 %	-0.3 %

Pierre Carbonnelle, 2020

概要

- 你已经在撰写TypeScript!
- 可以写得更严谨
- 协助找出潜在异常程序片段
- JS的用途日益扩大
 - 小特效 -> 服务



线上执行语法测试 – TypeScript Playground

- 左边编辑后按下Run，右边观察结果

The screenshot displays the TypeScript Playground web application. The interface is divided into two main sections: a code editor on the left and a results pane on the right.

Left Panel (Code Editor):

- Header: **TypeScript** (with logo), Download, Docs, Handbook, Community, Playground, Tools.
- Sub-header: Playground, TS Config ▾, Examples ▾, What's New ▾, Settings.
- Toolbar: v4.0.2 ▾, Run, Export ▾, Share, →.
- Code (lines 1-15):

```
1 // Welcome to the TypeScript Playground, this is a website
2 // which gives you a chance to write, share and learn TypeScript.
3
4 // You could think of it in three ways:
5 //
6 // - A place to learn TypeScript in a place where nothing can break
7 // - A place to experiment with TypeScript syntax, and share the URLs w
8 // - A sandbox to experiment with different compiler features of TypeSc
9
10 const anExampleVariable = "Hello World"
11 console.log(anExampleVariable)
12
13 // To learn more about the language, click above in "Examples" or "What
14 // Otherwise, get started by removing these comments and the world is yc
15
```

Right Panel (Results):

- Header: .JS, .D.TS, Errors, Logs, Plugins.
- Content (lines 1-15):

```
"use strict";
// Welcome to the TypeScript Playground, this is a website
// which gives you a chance to write, share and learn TypeScript.
// You could think of it in three ways:
//
// - A place to learn TypeScript in a place where nothing can break
// - A place to experiment with TypeScript syntax, and share the URLs with others
// - A sandbox to experiment with different compiler features of TypeScript
const anExampleVariable = "Hello World";
console.log(anExampleVariable);
// To learn more about the language, click above in "Examples" or "What's New".
// Otherwise, get started by removing these comments and the world is your playground.
```

<https://www.typescriptlang.org/play/>

线上执行语法测试 – TypeScript Playground

- 在左边区块打上，然后按下Run

```
function addNumbers(x,y){  
  return x+y;  
}
```

```
console.log(addNumbers(3,6))
```

.JS .D.TS Errors **2** Logs Plugins

```
"use strict";  
function addNumbers(x, y) {  
  return x + y;  
}  
console.log(addNumbers(3, 6));
```

线上执行语法测试 – TypeScript Playground

- 右边区块切换至Errors瞧瞧

```
function addNumbers(x,y){  
  return x+y;  
}
```

```
console.log(addNumbers(3,6))
```

.JS .D.TS Errors² Logs Plugins

Errors in code

Parameter 'x' implicitly has an 'any' type.

Parameter 'y' implicitly has an 'any' type.

线上执行语法测试 – TypeScript Playground

- 但还是可以计算出结果

```
function addNumbers(x,y){  
  return x+y;  
}
```

```
console.log(addNumbers(3,6))
```

.JS .D.TS Errors **2** Logs Plugins

[LOG]: 9

线上执行语法测试 – TypeScript Playground

- 修改程式码进行测试

```
function addNumbers(x,y){  
  return x+y;  
}
```

```
console.log(addNumbers("three",6))
```

.JS .D.TS Errors **2** Logs Plugins

[LOG]: 9

[LOG]: "three6"

线上执行语法测试 – TypeScript Playground

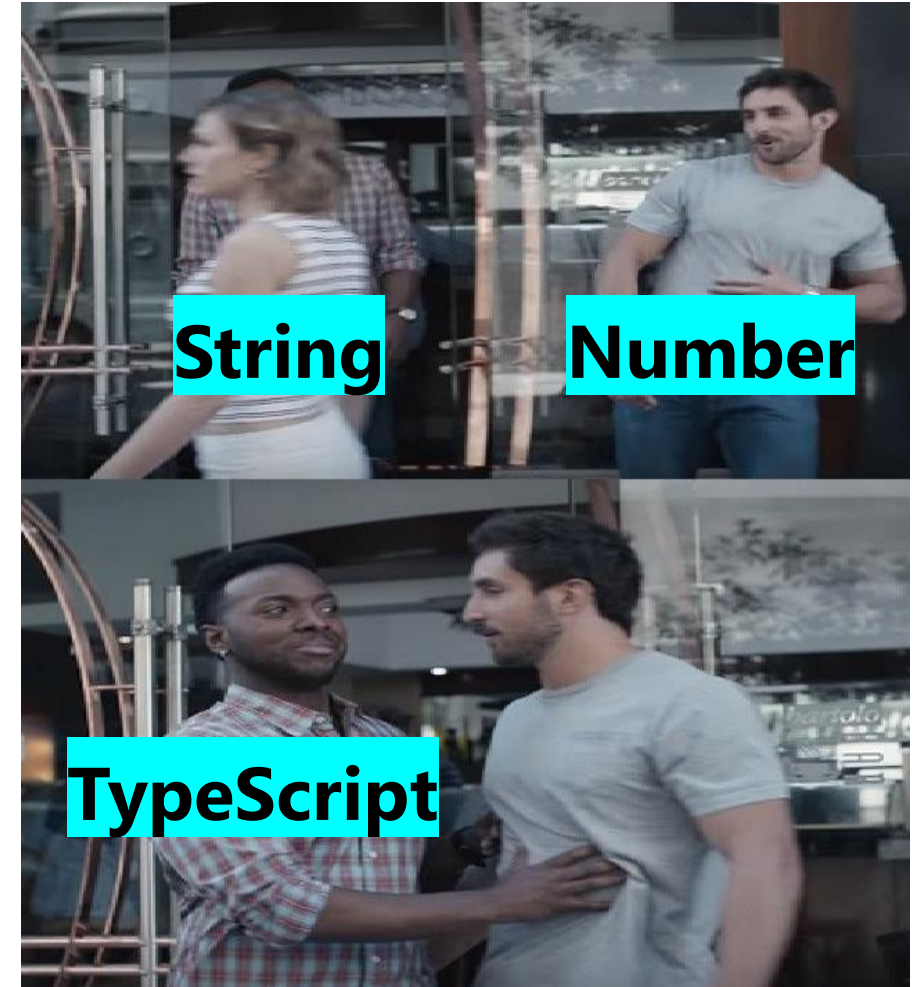
- 修改程式码进行测试

```
function addNumbers(x:number,y:number){  
  return x+y;  
}
```

```
console.log(addNumbers("three",6))
```

Argument of type 'string' is not assignable to parameter of type 'number'. (2345)

[Peek Problem \(Alt+F8\)](#). No quick fixes available



线上执行语法测试 – TypeScript Playground

- 再次修改程式码进行测试

```
function addNumbers(x:number,y:number){  
    return x+y;  
}
```

[.JS](#) [.D.TS](#) [Errors](#) [Logs](#) [Plugins](#)

```
console.log(addNumbers(3,6))
```

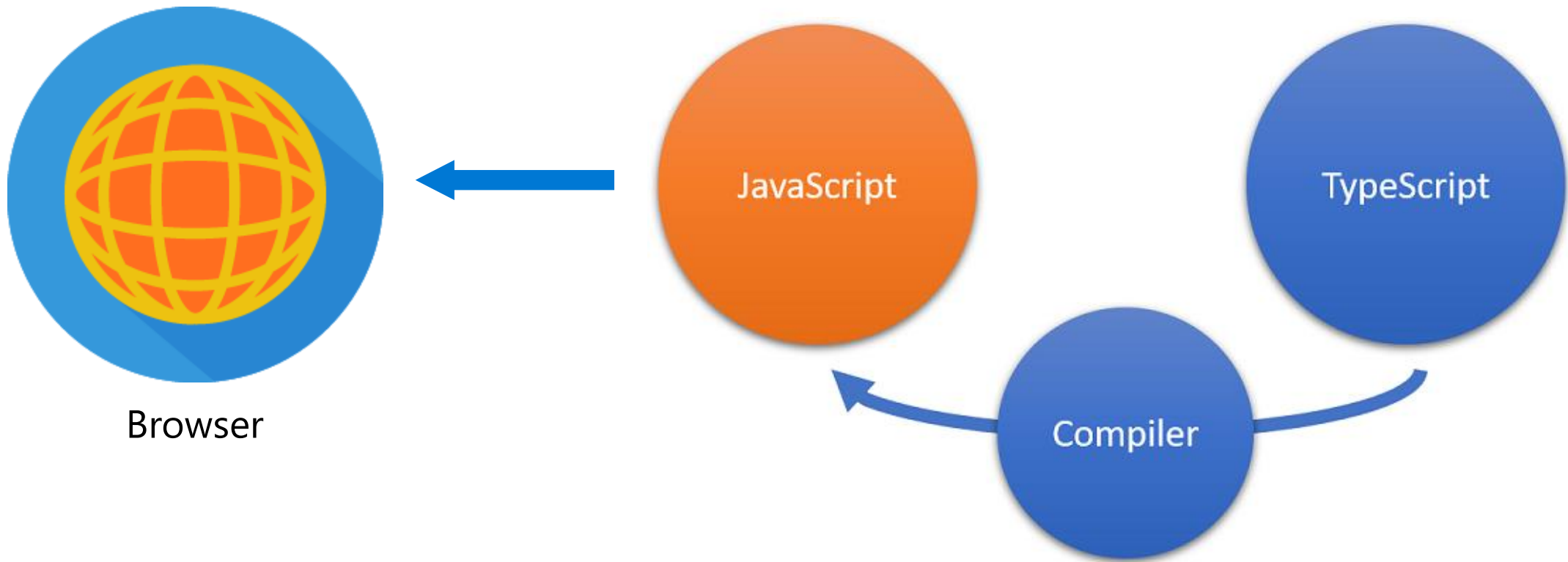
[LOG]: 9

[LOG]: "three6"

[LOG]: 9

JavaScript, TypeScript & 浏览器

- TypeScript -> 编译 -> JavaScript
- JavaScript -> 给浏览器

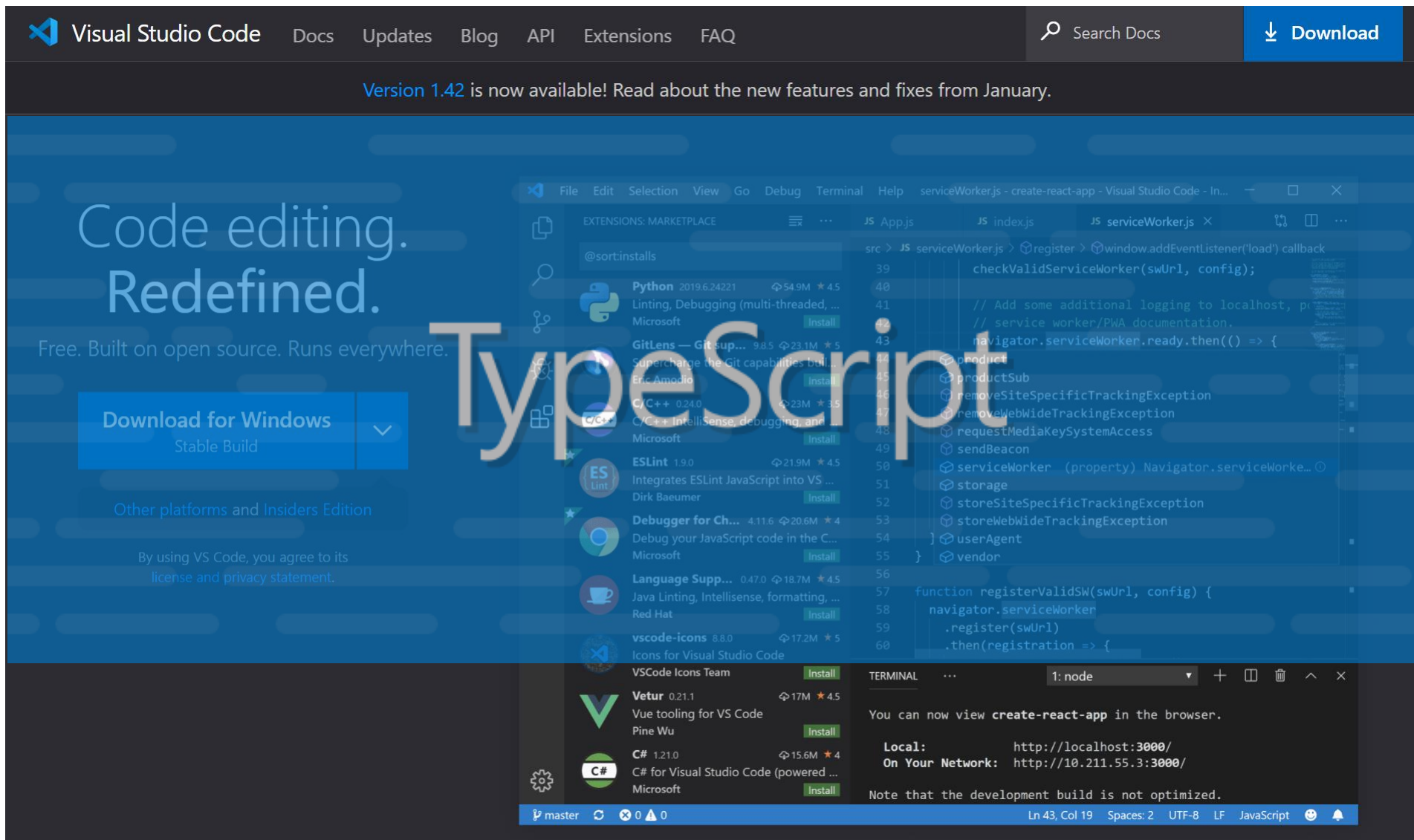


本地端安装 TypeScript 编译程序

- 打开命令提示字符
- 输入
 - `npm install -g typescript`
- 检查版本
 - `tsc --version`

开发环境

<https://github.com/ryan403/reactor-sh-2021-typescript>



<https://code.visualstudio.com/>

17

Microsoft

Reactor

第一个TypeScript专案

- 建立文件夹HelloTS
- 新增档案helloworld.ts
- 输入内容

```
let message:string = "Hello World";  
console.log(message);
```

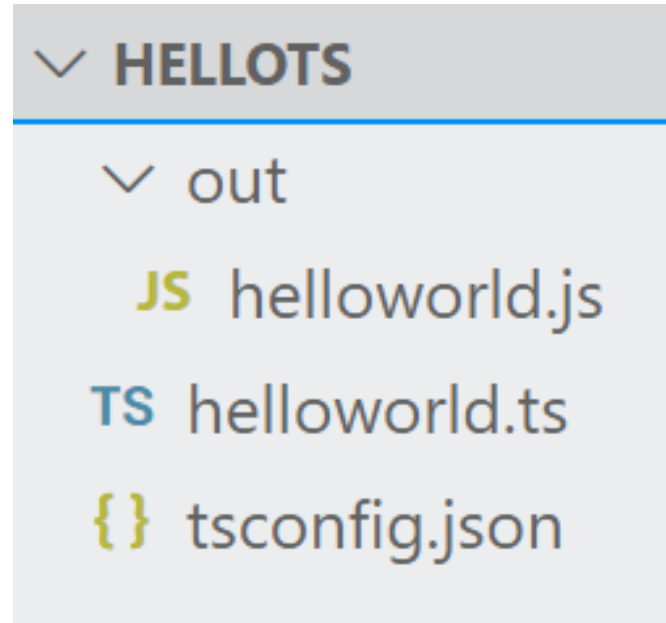
- 执行
 - Ctrl + ~ 带出终端机
 - 输入 tsc helloworld.ts
 - 产生helloworld.js
 - 再输入 node helloworld.js

增加TypeScript配置文件：tsconfig.json

```
{  
  "compileOnSave": true,  
  "compilerOptions": {  
    "target": "es5",  
    "module": "commonjs",  
    "outDir": "out"  
  }  
}
```

将js输出到别的文件夹

- 建立out文件夹
- 终端机执行
 - tsc



练习：设置TypeScript专案

- 开启VS Code
- 档案 -> 将资料夹新增至工作区...
- 新增资料夹 Module 01 Exercise
- 选取该资料夹 -> 新增
- 档案 -> 另存工作区为...
- `typescript.workspace.code-workspace`

练习：设置TypeScript专案

- 在Module 01 Exercise资料夹中新增档案
 - `module01.ts`
- 检视 -> 终端
 - `tsc --init`
- 检视`tsconfig.json`档案
 - 找到`target`，将`es5`改为`ES2015`
`"target": "ES2015",`
 - 找到`outDir`，取消注解，设定为`build`
`"outDir": "build",`
- 在Module 01 Exercise资料夹中新增资料夹
 - `build`
- 在终端机中执行 `tsc` 读取最新`tsconfig.json`设置

编译TypeScript至JavaScript

- 编辑module01.ts

```
function addNumbers(x, y){  
    return x + y;  
}  
console.log(addNumbers(3,6));
```

- 此时VS Code已提示错误

```
1 function addNumbers(x, y){  
2     return x + y;  
3 }  
4 console.log(addNumbe
```

(parameter) x: any

參數 'x' 隱含了 'any' 類型。 ts(7006)

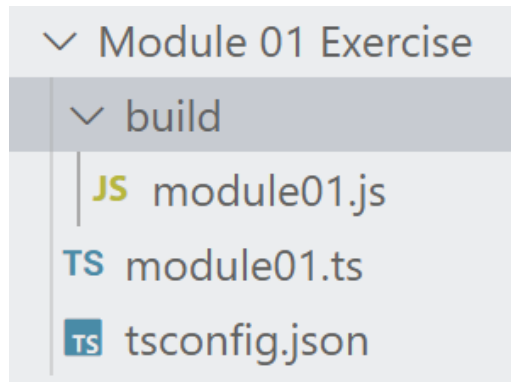
檢視問題 (Alt+F8) 快速修復... (Ctrl+.)

编译TypeScript至JavaScript

- 修改module01.ts

```
function addNumbers(x:number, y:number){  
    return x + y;  
}  
console.log(addNumbers(3,6));
```

- 终端机执行 tsc，顺利产生module01.js



编译TypeScript至JavaScript

- 观察module01.ts与module01.js
- 点击右上方  向右分割编辑器，将module01.js显示在右方

```
TS module01.ts × tsconfig.json
Module 01 Exercise > TS module01.ts > ...
1 function addNumbers(x:number, y:number){
2     return x + y;
3 }
4 console.log(addNumbers(3,6));
```

```
TS module01.ts × tsconfig.json
Module 01 Exercise > TS module01.ts > ...
1 function addNumbers(x:number, y:number){
2     return x + y;
3 }
4 console.log(addNumbers(3,6));

JS module01.js ×
Module 01 Exercise > build > JS module01.js > ...
1 "use strict";
2 function addNumbers(x, y) {
3     return x + y;
4 }
5 console.log(addNumbers(3, 6));
6
```

编译TypeScript至JavaScript

- 执行module01.js
 - 检视 -> 终端
- 确认是否有看到输出结果

9

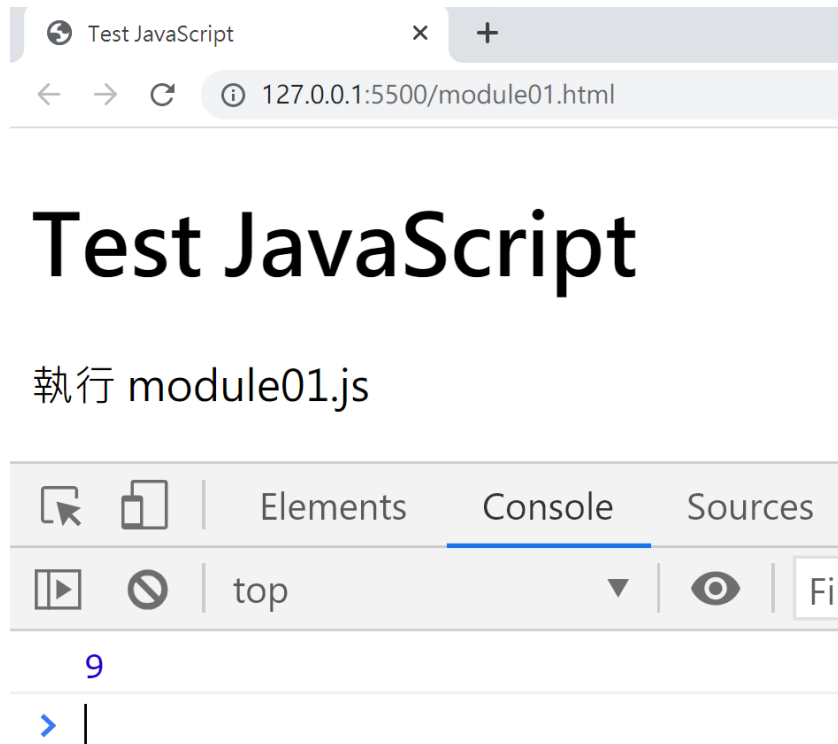
透过HTML网页执行JavaScript

- 在Module 01 Exercise资料夹中
 - 建立module01.html

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>Test JavaScript</title>
    <link rel="stylesheet" href="">
  </head>
  <body>
    <h1>Test JavaScript</h1>
    <p id="date"></p>
    <p>执行 module01.js</p>
    <script src="./build/module01.js"></script>
  </body>
</html>
```

透过HTML网页执行JavaScript

- 在侧边栏module01.html点击滑鼠右键
 - Open with Live Server 或 使用预设浏览器开启
 - 网页在浏览器中开启后，同时打开开发人员工具->Console



知识检查

1. TypeScript 和 JavaScript 之间有什么关系？

- ☐ TypeScript 是 JavaScript 的一个超集。
- ☐ TypeScript 与 JavaScript 完全相同。
- ☐ TypeScript 是 JavaScript 的一个子集。

2. 为什么需要先将 TypeScript 代码编译（或转译）为 JavaScript 才能在应用程序中使用？

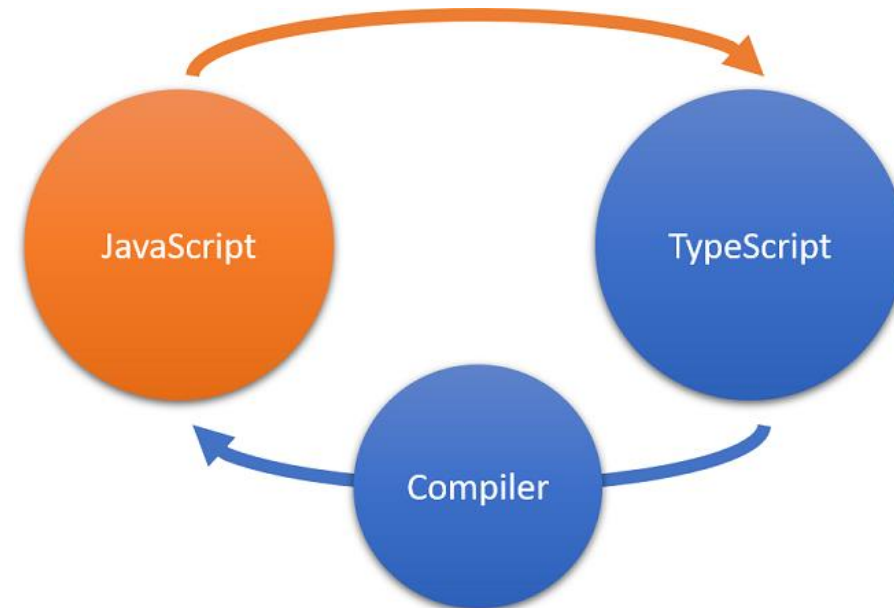
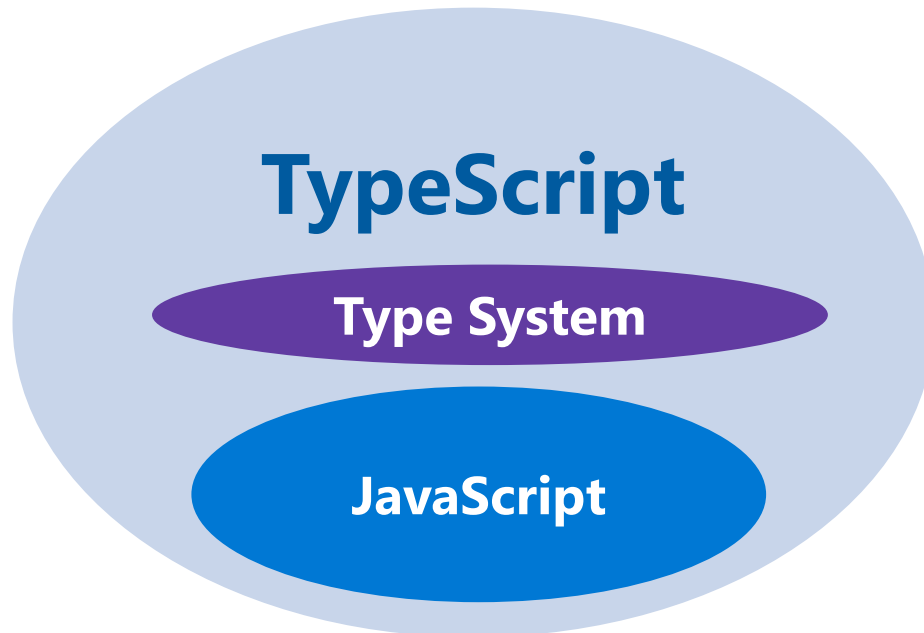
- ☐ 无需执行此操作，因为只需使用 .js 扩展名重命名 TypeScript 文件它就可以正常工作。
- ☐ TypeScript 代码是有效的 JavaScript，而 JavaScript 代码不是有效的 TypeScript。
- ☐ TypeScript 包含与浏览器不兼容的代码功能。

3. `npm install -g typescript` 命令有什么作用？

- ☐ 安装 npm，以便你可以安装 TypeScript。
- ☐ 在计算机上全局安装 TypeScript 编译器。
- ☐ 安装 Node.js 和 npm。

摘要

- TypeScript VS. JavaScript
- 安装TypeScript环境
- 使用VS Code开发与编译TypeScript





在 TypeScript 中声明变量类型

38 分钟 • 模块 • 10 单元

★★★★★ 4.8 (44)

中级

开发人员

学生

Azure

Visual Studio Code

JavaScript 是一种动态类型的语言。虽然这种语言可以简单地声明变量，但在某些情况下会导致意想不到的结果。通过 TypeScript 中的静态类型系统，你可以描述对象的形状，从而提供更好的文档并允许 TypeScript 验证代码是否正常工作。在 TypeScript 中，命名空间、类、属性、函数、变量和其他语言实体的声明将类型与这些实体相关联。类型形成和与语言实体关联的方式取决于实体的种类。该模块介绍了一些可用的类型，并展示了如何将它们与变量相关联。后面的模块将检查接口、函数和类如何使用静态类型。

学习目标

通过学习本模块，你将了解如何：

- 说明在 TypeScript 中声明类型变量的优点。
- 使用基元类型声明变量。
- 使用对象类型声明变量。
- 使用联合和交叉类型声明变量。

先决条件

- 熟悉 JavaScript。
- 熟悉在 JavaScript 中使用 `let` 和 `const` 声明变量。
- TypeScript 的基本知识。
- 安装的软件：
 - [Git](#)
 - [Visual Studio Code](#)
 - [Node.js](#)
 - TypeScript

学习目标

- 了解在TypeScript中宣告型别的好处
- 原生型别(primitive type)宣告
- 物件型别(object type)宣告
- Union与Intersection型别宣告

型别宣告练习

- 在本机建立Module 02 Exercise资料夹
- 打开VS Code，档案 -> 开启资料夹...
- 新增档案hellpType.ts
- 开始练习

helloType.ts

- 宣告x为number型态
 - 试着给予x不是数字的值
- y因为给予1而也获得了number型态
 - 试着设定y不是数字的值
- z因为没有初始值，而获得了any型态
 - 试着给予z数字、非数字的值

```
let x:number;  
let y = 1;  
let z;
```

Type 型態

any

Primitive types

boolean
number
string
enum
void

Object types

class
interface
array
literals

Type
parameters

null
undefined

Primitive type 原生型态

- boolean, number, string, enum
- void
 - 用在标示函数没有回传值
- null, undefined
 - 其他型态的子型态(subtype)

Primitive type 原生型态

```
let isMale:boolean = true;  
let user_weight:number = 77;  
let user_name = "Ryan";
```

```
enum CurrentStatus {  
    Working,  
    Playing,  
    Sleeping,  
    Eating  
}
```

```
let user_status:CurrentStatus = CurrentStatus.Playing;
```

```
console.log(user_status);
```

1



Primitive type 原生型态

```
let isMale:boolean = true;  
let user_weight:number = 77;  
let user_name = "Ryan";
```

```
enum CurrentStatus {  
    Working,  
    Playing,  
    Sleeping,  
    Eating  
}
```

```
let user_status:CurrentStatus = CurrentStatus.Playing;
```

```
console.log(CurrentStatus[user_status]);
```

Playing



列举 enum

- 具有默认顺序性的限定选项

```
enum Days {星期天, 星期一, 星期二, 星期三, 星期四, 星期五, 星期六};  
  
console.log("您预约的是"+Days[6]);
```

您预约的是星期六

枚举 enum

- 有需要也可自行指定

```
enum Days {星期天=7, 星期一=1, 星期二=2, 星期三=3, 星期四=4, 星期五=5, 星期六=6};  
  
console.log("您预约的是"+Days[7]);
```

您预约的是星期天

TypeScript世界中的弹性 - any

- 给予不同资料型态也可以

```
let anyTypeValue:any = 10;  
anyTypeValue = "Hello";  
anyTypeValue = true;
```

TypeScript世界中的弹性 - any

- 甚至这样也不会报错

```
let anyTypeValue:any = 10;  
anyTypeValue = "Hello";  
anyTypeValue = true;
```

```
console.log(anyTypeValue.unknownProperty);  
anyTypeValue();  
anyTypeValue.toUpperCase();
```

TypeScript世界中的弹性 - any

- 但执行js就出事了...

```
let anyTypeValue:any = 10;  
anyTypeValue = "Hello";  
anyTypeValue = true;
```

```
console.log(anyTypeValue.unknownProperty);  
anyTypeValue();  
anyTypeValue.toUpperCase();
```

```
out\helloType.js:31  
anyTypeValue();  
^
```

```
TypeError: anyTypeValue is not a function  
at Object.<anonymous>
```

TypeScript 新兵报到 – 弹性中带有原则 Unknown

- 跟any一样，这样写是可以的

```
let unknownValue:unknown = 10;  
unknownValue = "Hello";  
unknownValue = true;
```


TypeScript 新兵报到 – 弹性中带有原则 Unknown

- 这样写就不允许了

```
let unknownValue:unknown = 10;  
unknownValue = "Hello";  
unknownValue = true;
```

```
console.log(unknownValue.unknownProperty);  
unknownValue();  
unknownValue.toUpperCase();
```

```
let unknownValue: unknown
```

```
物件的類型為 '未知'。 ts(2571)
```

如果你真的非常确定，你可以这么干... (Type assertion)

```
let unknownValue: unknown = 10;  
unknownValue = "Hello";  
//unknownValue = true;  
  
//console.log(unknownValue.unknownProperty);  
//unknownValue();  
console.log((unknownValue as string).toUpperCase());
```

HELLO



也可以这样子

```
let unknownValue:unknown = 10;  
unknownValue = "Hello";  
//unknownValue = true;  
  
//console.log(unknownValue.unknownProperty);  
//unknownValue();  
console.log((unknownValue as string).toUpperCase());  
console.log(<string>unknownValue.toLowerCase());
```

HELLO
hello



如果还是不放心的，可以这么写

```
let unknownValue:unknown = 10;  
unknownValue = "Hello";  
//unknownValue = true;  
  
//console.log(unknownValue.unknownProperty);  
//unknownValue();  
if(typeof unknownValue === 'string'){  
    console.log((unknownValue as string).toUpperCase());  
    console.log(<string>unknownValue.toLowerCase());  
}else{  
    console.log("It's not a string");  
}
```

HELLO
hello



万一不是字符串，依然可以执行

```
let unknownValue: unknown = 10;  
//unknownValue = "Hello";  
unknownValue = true;  
  
//console.log(unknownValue.unknownProperty);  
//unknownValue();  
if(typeof unknownValue === 'string'){  
    console.log((unknownValue as string).toUpperCase());  
    console.log(<string>unknownValue.toLowerCase());  
}else{  
    console.log("It's not a string");  
}
```

It's not a string



指定多种输入数据型别(联合 Union)

- 允许字符串或字符串数组作为输入值

```
function getLength(obj: string | string[]){  
    return obj.length;  
}
```

```
console.log(getLength("Hello"));  
console.log(getLength(["David", "John", "Ryan"]));
```

5

3

指定多种输入数据型别(联合 Union)

- 允许字符串或字符串数组作为输入值
- 对应产生不同回应

```
function getLength(obj: string | string[]){  
  if(typeof obj === "string"){  
    return "来了一个勇者，叫做"+obj;  
  }else{  
    return "对方来了"+obj.length+"个人";  
  }  
}
```

```
console.log(getLength("王小明"));  
console.log(getLength(["张三","李四","王五"]));
```

来了一个勇者，叫做王小明
对方来了3个人

指定多种输入数据型别(联合 Union)

- 允许字符串或数字作为输入值
- 对应产生不同回应

```
function getNumber(obj: number | string){  
  if(typeof obj === "string"){  
    return "国字的"+obj;  
  }else{  
    return `${obj}+3=${obj+3}`  
  }  
}
```

```
console.log(getNumber("七"));  
console.log(getNumber(7));
```

国字的七

7 + 3 = 10

指定多种输入数据类型别(交叉 Intersection)

- 通常与interface搭配使用
- 该型态则拥有所有的属性

```
interface BasicProfile{  
    name:string;  
    age:number;  
}
```

```
interface ExtraProfile{  
    education:string;  
    work_experience:number;  
}
```

```
type FullProfile = BasicProfile & ExtraProfile;
```

```
let newbie1_full_profile:FullProfile = {  
    name:"Ryan",  
    age:99,  
    education:"Master",  
    work_experience:15  
}
```

自定义数据型态(literal type)

- 输入时会有选择效果

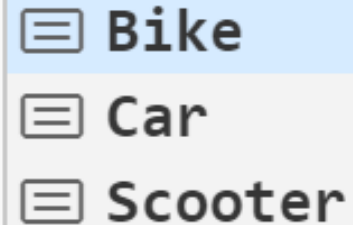
```
type trafficTools = "Bike" | "Car" | "Scooter";
```

```
let myTrafficTool:trafficTools = "Bike";
```

```
console.log(myTrafficTool);
```

```
let myTrafficTool:trafficTools = ""
```

```
console.log(myTrafficTool);
```



Bike
Car
Scooter

自定义数据型态(literal type)

- 乱打会被发现...

```
type trafficTools = "Bike" | "Car" | "Scooter";
```

```
let myTrafficTool:trafficTools = "Boat";
```

```
console.log(myTrafficTool);
```

```
let myTrafficTool: trafficTools
```

```
類型 '"Boat"' 不可指派給類型 'trafficTools'。 ts(2322)
```

自定义数据型态(literal type)

- 数字也可以

```
type dice = 1|2|3|4|5|6;
```

```
let diceRoll:dice;
```

```
diceRoll = 6;
```

指定数据型别的数组

• Array<elemType>

```
type StringArray = Array<String>;  
type NumberArray = Array<number>;  
type ObjectWithNameArray = Array<{name:string}>;
```

```
let className:StringArray = ["HTML", "CSS", "JavaScript", "TypeScript"];  
let audienceNumber:NumberArray = [666,777,888,999];  
let instructors:ObjectWithNameArray = [  
    {name:"Ryan"}, {name:"David"}, {name:"John"}, {name:"Marry"}  
];
```

```
console.log(`在${className[0]}课中，有${audienceNumber[0]}人参与，讲师是  
${instructors[0].name}`);
```

在HTML课中，有666人参与，讲师是Ryan

指定数据型别的数组

- 也可写成

```
type StringArray = string[];  
type NumberArray = number[];  
type ObjectWithNameArray = {name:string}[];
```

```
let className:StringArray = ["HTML", "CSS", "JavaScript", "TypeScript"];  
let audienceNumber:NumberArray = [666,777,888,999];  
let instructors:ObjectWithNameArray =  
    [{name:"Ryan"},{name:"David"},{name:"John"},{name:"Marry"}];  
  
console.log("在"+className[0]+"课中，有"+audienceNumber[0]+"人参与，讲师是"+  
    instructors[0].name);
```

在HTML课中，有666人参与，讲师是Ryan

多重数据型别的数组

- 指定需要的数据型别

```
type multiTypeArray = Array<String|number>;  
let myMultiTypeArray:multiTypeArray = [1,2,3,"one","two","three"];
```

多重数据型别的数组

- 指定需要的数据型别

```
type multiTypeArray = Array<String|number>;  
let myMultiTypeArray:multiTypeArray = [1,2,3,"one","two","three"];
```

- 不过乱写还是会被揪出来...

```
type multiTypeArray = Array<String|number>;  
let myMultiTypeArray:multiTypeArray = [1,2,3,"one","two","three"];  
let myMultiTypeArray2:multiTypeArray = [1,2,3,"one","two","three",true];
```

類型 'boolean' 不可指派給類型 'number | String'。 ts(2322)

多重数据型别的数组

- 直接赋予值可以这样写

```
let thisNameAndAge2:Array<String|number> = ['Jessica',18];
```

具有顺序的多重数据类型数组(Tuple)

- 使用时记得按照顺序赋予值

```
type orderedMultiTypeArray = [string, number];  
let thisNameAndAgeWithOrder:orderedMultiTypeArray = ["Luis",80];
```

- 直接赋予值可以这样写

```
let thisNameAndAgeWithOrder2:[string,number] = ['Ryan',99];
```

综合练习

- 下载档案

`git clone https://github.com/MicrosoftDocs/mslearn-typescript`

- 开启练习资料夹

- `mslearn-typescript/code/module-02/m02-start`

- 开启练习档案

- `module02.ts`

Exercise 1

- 在宣告处增加资料型别

Exercise 1

- 在宣告处增加资料型别

```
let firstName:string;  
let lastName:string;  
let fullName:string;  
let age:number;  
let ukCitizen:boolean;
```

```
firstName = 'Rebecca';  
lastName = 'Smith';  
age = 42;  
ukCitizen = false;  
fullName = firstName + " " + lastName;
```

```
if (ukCitizen) {  
    console.log("My name is " + fullName + ", I'm " + age + ", and I'm a citizen of the United Kingdom.");  
} else {  
    console.log("My name is " + fullName + ", I'm " + age + ", and I'm not a citizen of the United Kingdom.");  
}
```

Exercise 2

- 修正程式码与数值，让a顺利产生12

Exercise 2

- 修正程式码与数值，让a顺利产生12

```
let x:number;  
let y:number;  
let a:number;
```

```
x = 5;  
y = 7;  
a = x + y;
```

```
console.log(a);
```

Exercise 3

- 建立enum，并修改使用enum作为函数输入

Exercise 3

- 建立enum，并修改使用enum作为函数输入

```
enum Season{  
  "Fall",  
  "Winter",  
  "Spring",  
  "Summer"  
};
```

```
function whichMonths(season: Season){  
  let monthsInSeason: string;  
  switch (season) {  
    case Season.Fall:  
      monthsInSeason = "September to November";  
      break;  
    case Season.Winter:  
      monthsInSeason = "December to February";  
      break;  
    case Season.Spring:  
      monthsInSeason = "March to May";  
      break;  
    case Season.Summer:  
      monthsInSeason = "June to August";  
  }  
  return monthsInSeason;  
}
```

```
console.log(whichMonths(Season.Fall));
```

Exercise 4

- 将randomNumbers宣告为数字数组
- 将nextNumber宣告为数字

Exercise 4

- 将randomNumbers宣告为数字数组
- 将nextNumber宣告为数字

```
let randomNumbers: Array<number> = [];  
let nextNumber: number;  
  
for (let i = 0; i < 10; i++) {  
    nextNumber = Math.floor(Math.random() * (100 - 1)) + 1;  
    randomNumbers.push(nextNumber);  
}  
  
console.log(randomNumbers);
```

知识检查

1. `boolean`、`number`、`string` 和 `enum` 类型是 `any` 的哪一类子类型的示例？

- ☐ 类型参数。
- ☐ 对象类型。
- ☐ 基元类型。

2. 以下哪种类型是对象类型的示例？

- ☐ `Array`。
- ☐ `void`。
- ☐ 类型参数。

3. `any` 和 `unknown` 类型之间的主要区别是什么？

- ☐ 可以将任何值赋给 `unknown`，但是 `any` 类型有一些约束。
- ☐ 可以访问 `unknown` 类型的属性，但不能访问 `any` 类型的属性。
- ☐ 可以访问 `any` 类型的属性，但不能访问 `unknown` 类型的属性。

知识检查

4. TypeScript 中告诉编译器“我知道我在做什么吗”的功能叫什么？

- ☐ 字面量收缩。
- ☐ 类型断言。
- ☐ 类型保护。

5. 什么是元组？

- ☐ 具有无限数量的相同类型元素的数组。
- ☐ 具有特定数量的相同类型元素的数组。
- ☐ 具有特定数量的一种或多种类型元素的数组。

摘要

- 变数宣告静态型别的好处
- Primitive Type
 - boolean, number, string, enum
- Object Type
 - class, interface, array, literal
- 多重资料型别
 - Union Type(|)
 - Intersection Type(&)
 - literal
 - Tuple





Reactor



developer.microsoft.com/reactor/
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议程结束 感谢聆听



请记得填写课程回馈问卷 (Event ID : **XXXXXX**)
<https://aka.ms/Reactor/Survey>

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