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Typing With TypeScript

Shreya Khandelwal
Nirali Sahoo



About the Speakers:



Shreya Khandelwal

- Born and brought up in Rajasthan, India
- Beta MLSA
- <https://www.linkedin.com/in/shreyakhandelwal99/>



Nirali Sahoo

- Born and brought up in Odisha, India
- CSE Sophomore in IIIT Bhubaneswar
- Beta MLSA
- <https://www.linkedin.com/in/niralisahoo/>

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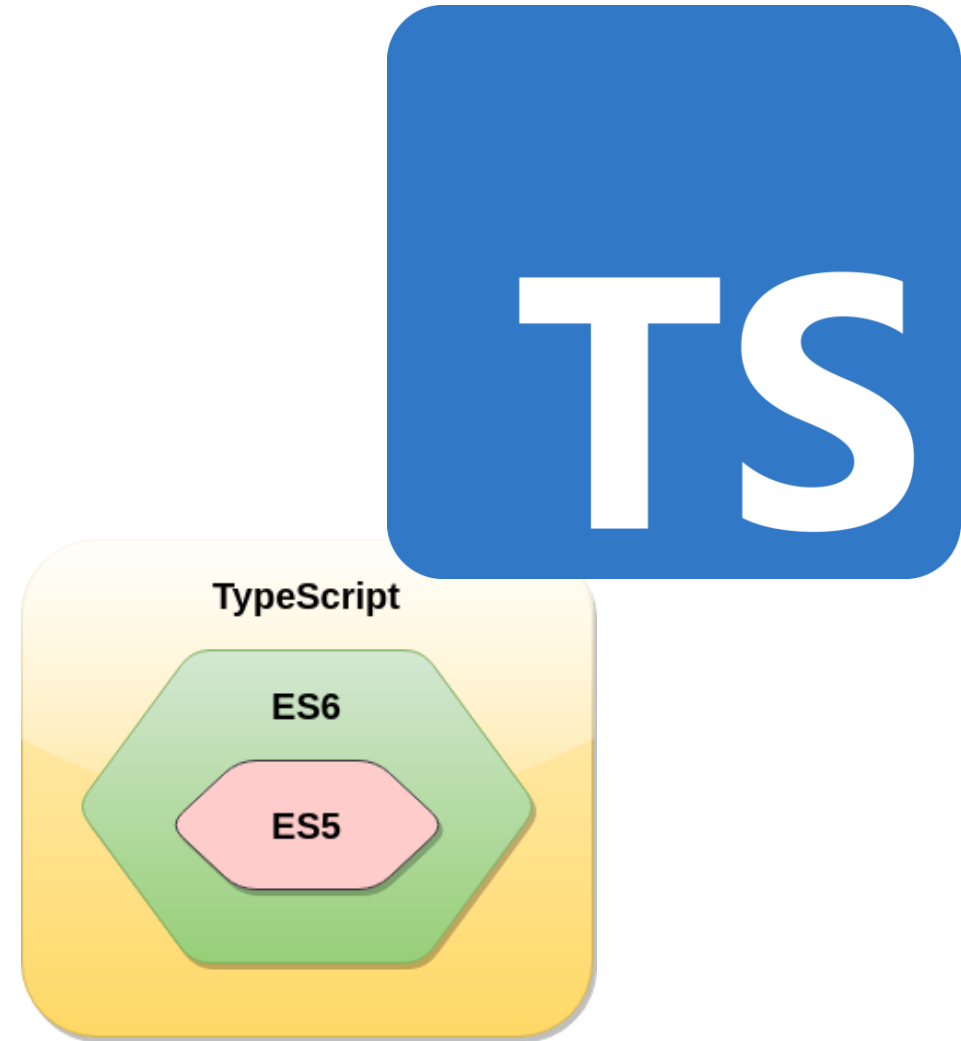
*"Empower every person and every organization on the planet
to achieve more."*

A community of like-minded people aiming to learn new skills, solve real-world problems, and build communities across the globe.



What is TypeScript

- ❑ TypeScript is an **open-source**, object-oriented programming language, which is developed and maintained by **Microsoft**.
- ❑ TypeScript is designed for the development of large applications.
- ❑ Superset of the JavaScript language
- ❑ TypeScript is the ES6 version of JavaScript with some additional features.



Why TypeScript



- Simplifies JavaScript code
- Syntax Similarity to Backend Languages like Java, Scala.
- Can be used anywhere: both the **frontend** and the **backend**.
- Designed for large-scale JavaScript application development
- TypeScript provides the error-checking feature at compilation time. It will compile the code, and if any error found, then it highlighted the mistakes before the script is run.

Future Scope

It provides great development experience

Doesn't have much competition

Enjoys high adoption rates among (especially new) open-source projects.

With nearly 400 contributors and 50,000 stargazers on GitHub, **TypeScript** clearly enjoys significant community momentum as well.

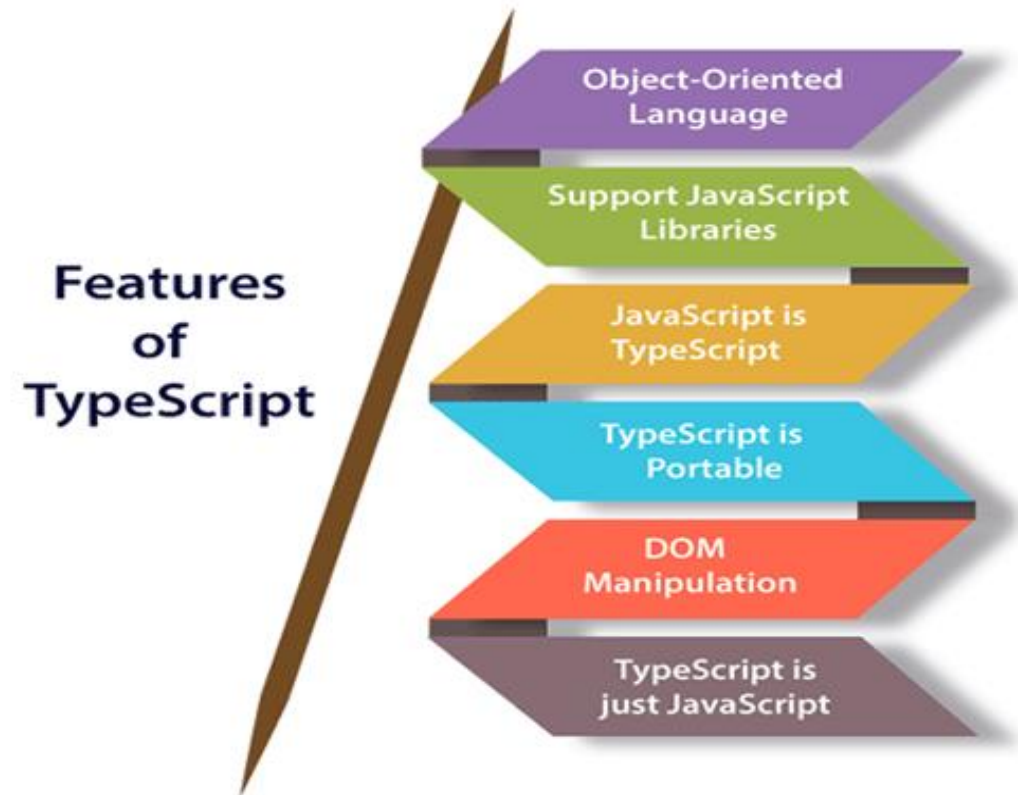


Difference between JavaScript and TypeScript

TypeScript	JavaScript
Object oriented programming language	Scripting language
Static typing	Do not support static typing
It compiles the code and highlighted errors during the development time	Interpreted language i.e. errors are highlighted at runtime.
Support modules and generics	Doesn't support modules and generics.

Features

- Object-Oriented language
- TypeScript supports JavaScript libraries
- Portable
- Use TypeScript anywhere
- DOM (Document object model) Manipulation
- Trans-compiled

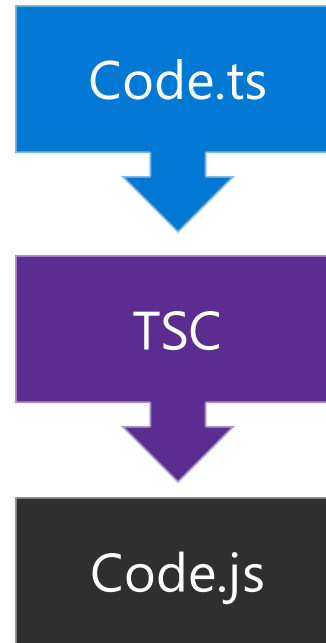


Components of TypeScript

1. Language

- TypeScript language elements
 - Syntax
 - Keywords
 - Type annotations

2. TypeScript Compiler



3. Language Services

- Information to editors for extra features like:
 - IntelliSense
 - Statement Completion
 - Automated refactoring
 - Colorization

ES ECMAScript

- Specification for interpretation of code and languages like JavaScript.
- Browsers and other tools use ECMAScript to interpret JavaScript.
- Need transpilers like Babel to convert modern code to old ECMAScript convention.

Installation and Set-up



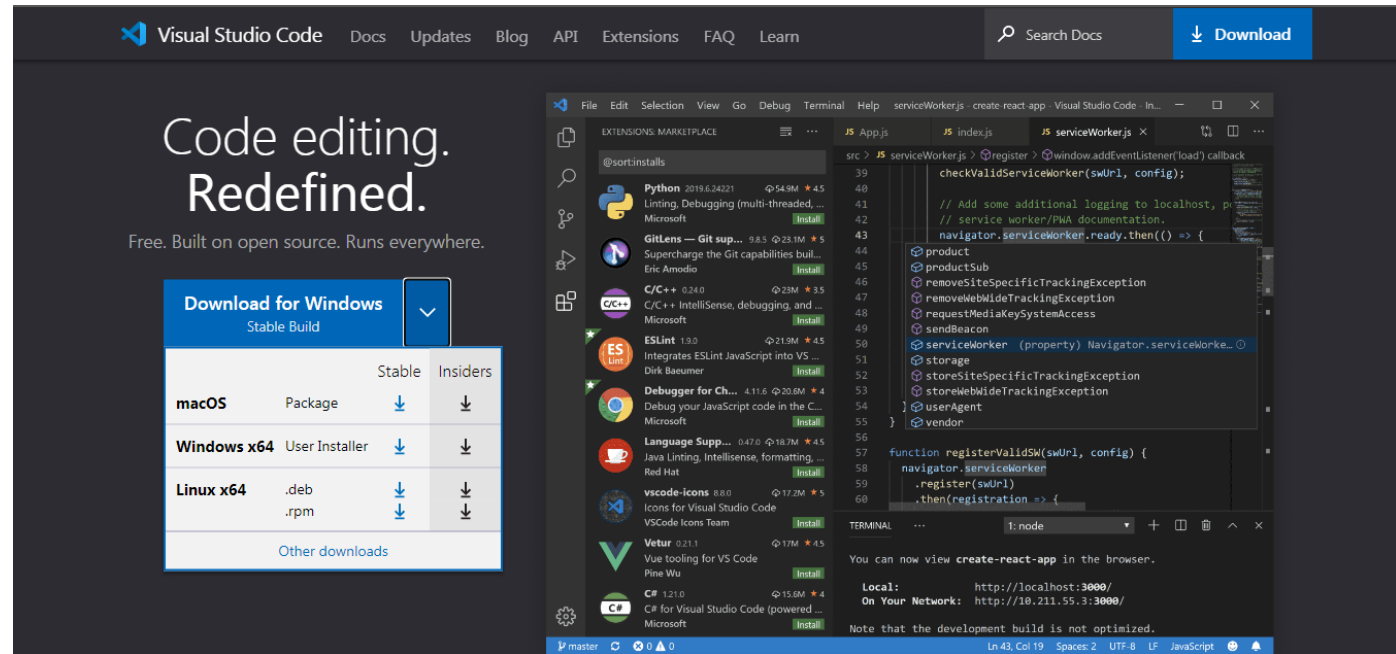


Visual Studio Code

- Free source code editor by Microsoft for Windows, Linux and macOS.

- Features:

- Syntax Highlighting
- Debugging
- IntelliSense
- Embedded Git



Download and install from <https://code.visualstudio.com/>

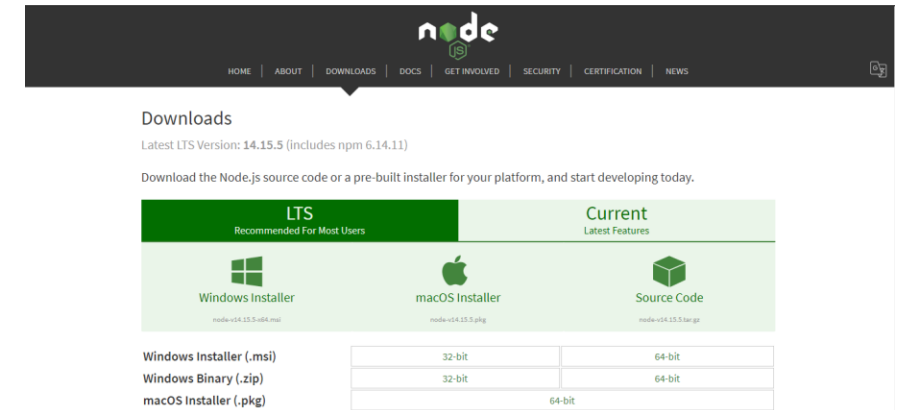
Installing TypeScript (via npm)

Requires Node.js (JavaScript Runtime)



Installing Node.js:

<https://nodejs.org/en/download/>



Installing TS:

```
npm install -g typescript
```

Setting up in Visual Studio Code

Compiling:

```
tsc <file_path>
```

Automated compilation:

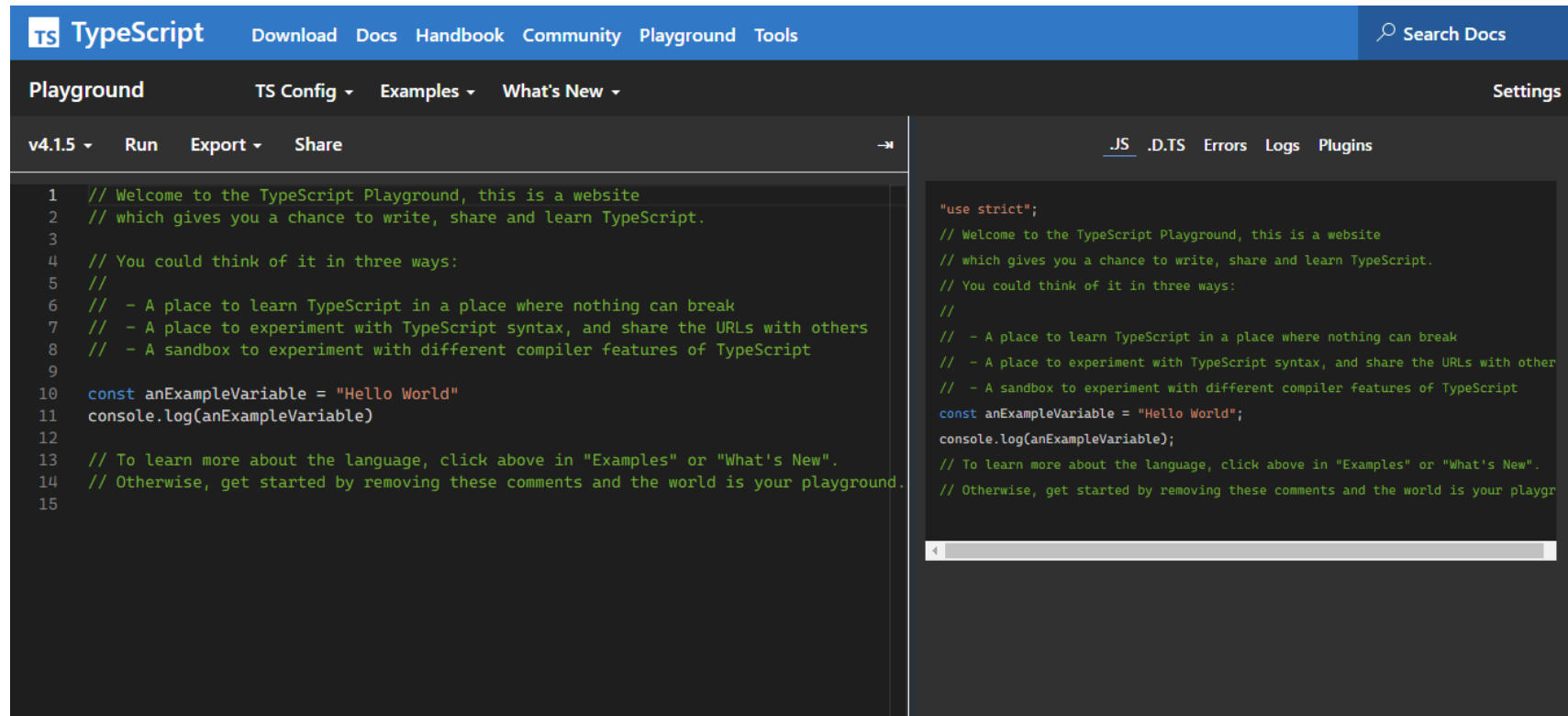
```
tsc -w <file_path>
```

tsconfig.json file:

```
TS tsconfig.json > ...
1  {
2    "compilerOptions": {
3      "target": "ES5"
4    }
5  }
```

Online Compiler

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



Getting Started

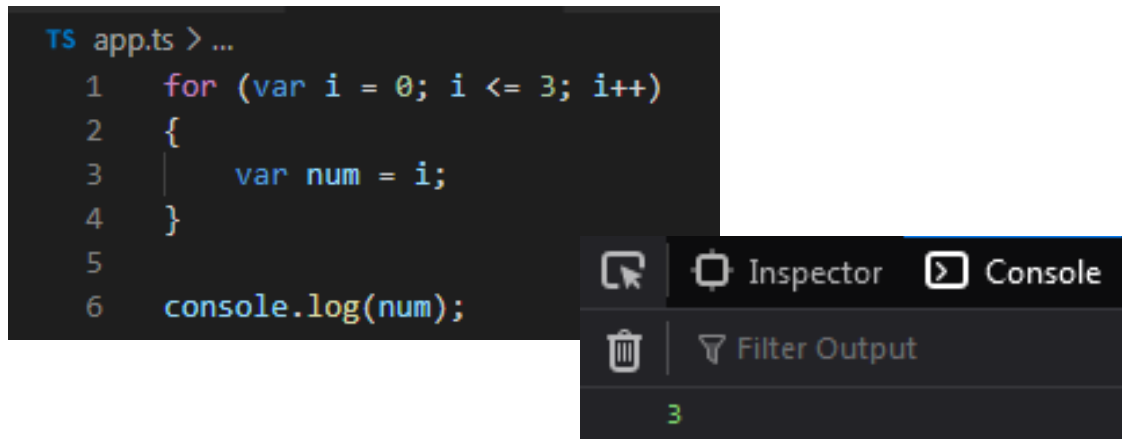


Variables

var

- i. Global scope
- ii. Variable can be redeclared

```
TS app.ts > ...
1  for (var i = 0; i <= 3; i++)
2  {
3      var num = i;
4  }
5
6  console.log(num);
```

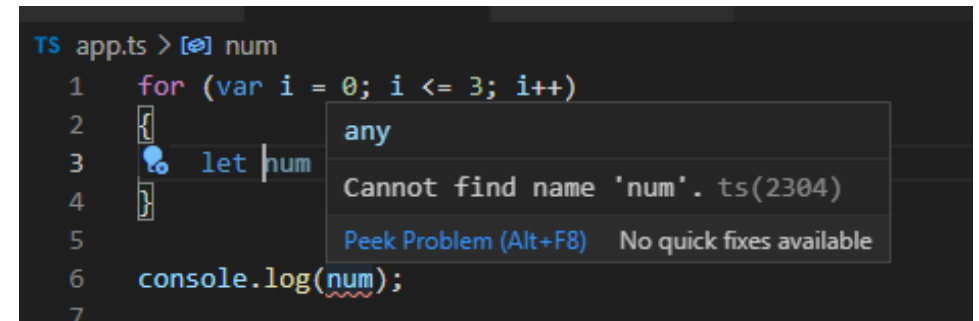


The screenshot shows a code editor with a TypeScript file named 'app.ts'. The code consists of a for loop that iterates from 0 to 3, declaring a variable 'i' with 'var'. Inside the loop, a variable 'num' is assigned the value of 'i'. After the loop, 'console.log(num)' is called. The output in the console is '3'. A dropdown menu is visible over the console, showing options like 'Inspector', 'Console', and 'Filter Output'.

let

- i. Limited to block scope
- ii. Variable cannot be redeclared

```
TS app.ts > [?] num
1  for (var i = 0; i <= 3; i++)
2  {
3      let num
4  }
5
6  console.log(num);
7
```



The screenshot shows a code editor with a TypeScript file named 'app.ts'. The code is similar to the previous example, but uses 'let' instead of 'var' to declare 'num' inside the loop. A TypeScript error is shown: 'Cannot find name 'num'. ts(2304)'. The error message also includes 'any' and 'Peek Problem (Alt+F8) No quick fixes available'.

Variables

const

- i. Once declared, its value cannot be changed

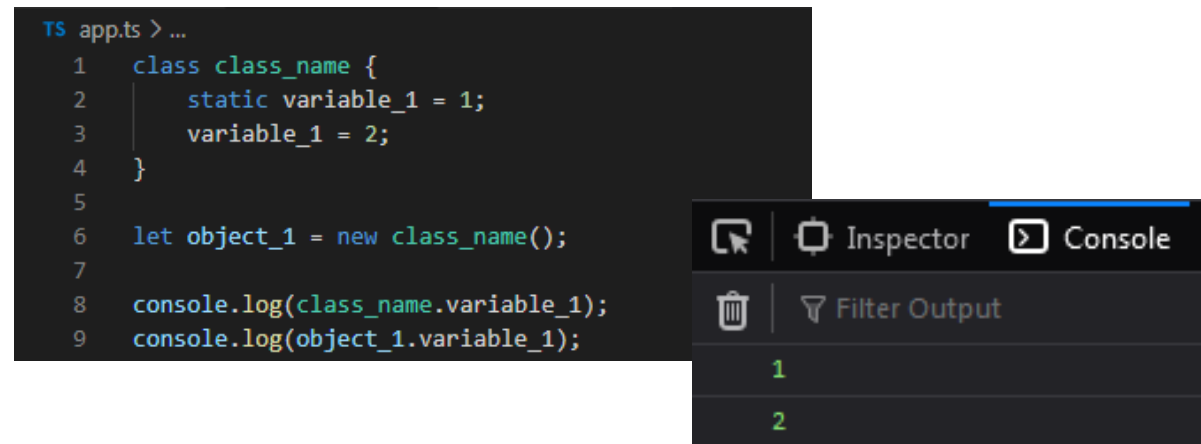
```
TS app.ts > ...
1  const num = 5;
2
3
4
5  for (var
6  {
7      var num = i;
8  }
9
10 console.log(num);
11
```



static

- i. Associated with a class and not with the object
- ii. Value can be accessed only when called on a class

```
TS app.ts > ...
1  class class_name {
2      static variable_1 = 1;
3      variable_1 = 2;
4  }
5
6  let object_1 = new class_name();
7
8  console.log(class_name.variable_1);
9  console.log(object_1.variable_1);
```



QnA

<https://www.linkedin.com/in/shreyakhandelwal99/>

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