TypeScript

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Java

Java

What is Java?

- Java is a high-level, object-oriented programming language developed by **Sun Microsystems** (now owned by Oracle Corporation).
- It was released in **1995** and designed to be platform-independent, making it a popular choice for cross-platform development.
- Java is regularly updated with new features and improvements.

- Programs in Java are organized into classes
- Classes are a **vital** part of a Java program. Without the class, we cannot create any Java program.

```java
// Java Code Example
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello, World!");
    }
}
```

Benefits

Java is a fast, secure, and reliable programming language

- High-Quality learning resources
- Security
- Platform Independent

Uses

- Game development
- Cloud Computing
- Big Data
- Artificial Intelligence
- Internet of Things

JavaScript

JavaScript

What is JavaScript?

- JavaScript is primarily used for building interactive and dynamic web pages.
- Invented by **Brendan Eich in 1995**.
- Developed for Netscape 2

```
function calculateArea(length, width) {
    return length * width;
}
var length = 5;
var width = 3;
var area = calculateArea(length, width);

console.log("The area of the rectangle with length " + length + " and width " + width + " is: " + area);
//The area of the rectangle with length 5 and width 3 is: 15
```

Benefits

- Speed
- Reduces load on server
- Rich interface
- Independent platform

Uses

- Web development
- Web applications
- Server applications
- Web servers
- Games

TypeScript

TypeScript

What is TypeScript?

- TypeScript is an **open-source** programming language developed by **Anders Hejlsberg in 2010 at Microsoft**
- It is a **superset of JavaScript**, meaning that all JavaScript code is valid TypeScript code.
- TypeScript has the features of **Object Oriented Programming**(OOPS), which makes its code immaculate and organized.

```
function calculateArea(length: number, width: number): number {
    return length * width;
}

let length: number = 5;
let width: number = 3;
let area: number = calculateArea(length, width);

console.log(`The area of the rectangle with length ${length} and width ${width} is: ${area}`);
//The area of the rectangle with length 5 and width 3 is: 15
```

Benefits

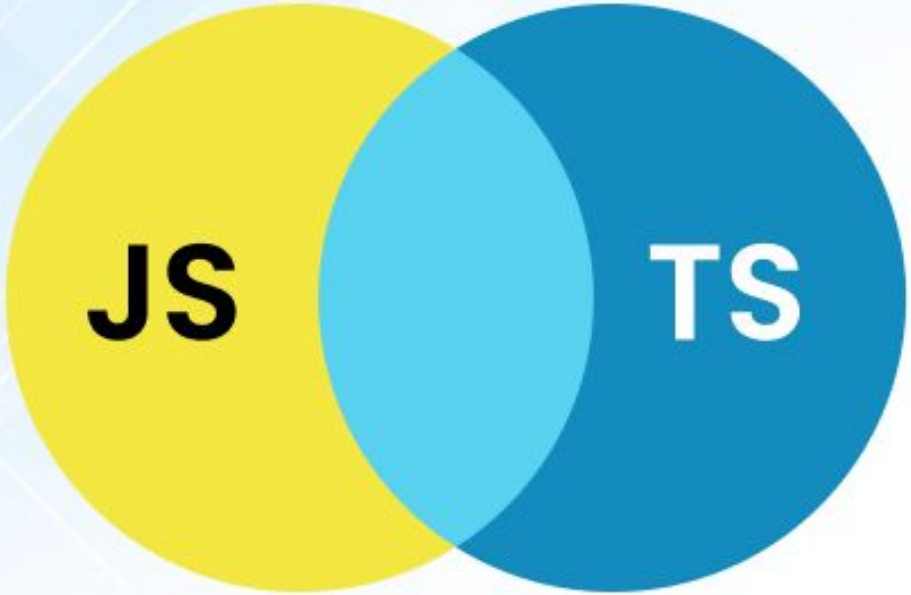
- Real time IDE feedback
- Static typing
- Predictability
- Code scalability

uses

- Desktop Application Development
- Frontend development
- Backend development
- Large-Scale projects

GRAFFERSID
WEB & APP DEVELOPMENT

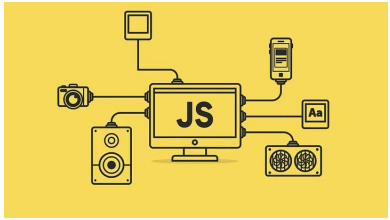
TypeScript VS JavaScript



JavaScript v TypeScript

JavaScript

- Used for web development
- All Java code is valid in TypeScript



TypeScript

- Superset of JavaScript
  - JavaScript + more attributes is TypeScript
- Used for server-side programming

JavaScript v TypeScript

JavaScript

- Popular libraries
  - Can be used in the typescript language
- Object oriented programming language

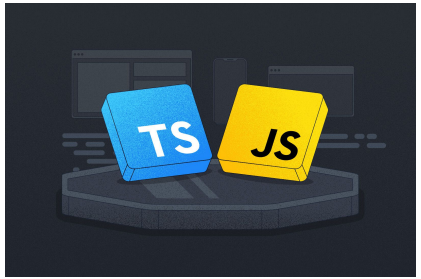
TypeScript

- Adds Static typing
- Typescript identifies 15% of JavaScripts errors
- prototype - based programming language

JavaScript v TypeScript

JavaScript

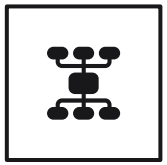
- Debugging: requires more testing
- Learning Curve: standard JavaScript is familiar
- Tooling: limited



TypeScript

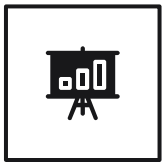
- Debugging: has stronger typing and can identify more errors
- Learning Curve: Takes time to learn new features
- Tooling: Has IDEs and code editors

Frameworks Using TypeScript



ts-Jest/JestJS

- Zero configuration
- Snapshots
- Isolated
- Great api



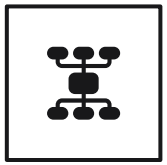
FeatherJS

- Fast
- Universal
- Flexible

LoopbackJS

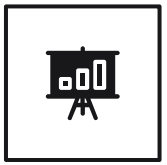
- Open API
- Extensible
- GraphQL

Startups Using TypeScript



Slack

- Business communication platform



Bitpanda

- Stock / cryptocurrency trading platform

Doordash

- Food delivery platform

Advantages of TypeScript

- **Optional Static Typing**
  - TypeScript allows the use of strict type declaration which allows for early bug detection
- **Scalability**
  - Through the use of static typing, TypeScript is able to retain readability and code maintenance for large-scale projects
- **Improve Tooling and IDE Support**
  - TypeScript provides tools and support to different IDEs which helps with productivity.

Disadvantages of TypeScript

- **Learning Curve**
  - Going from vanilla/plain JavaScript to TypeScript can be learning curve for many user
- **Compile Time**
  - TypeScript needs to transpile into JavaScript before running in most browsers which add additional time on compile time.
- **Smaller Ecosystem**
  - While it is still growing, some JavaScript libraries may not have TypeScript definitions resulting in more work on the user.

The Future of Typescript

The Return of Vanilla JavaScript

A few popular web applications projects such as Svelte and startups such as Turbo 8 have moved away from Typescript and moved back to vanilla/plain JavaScript.

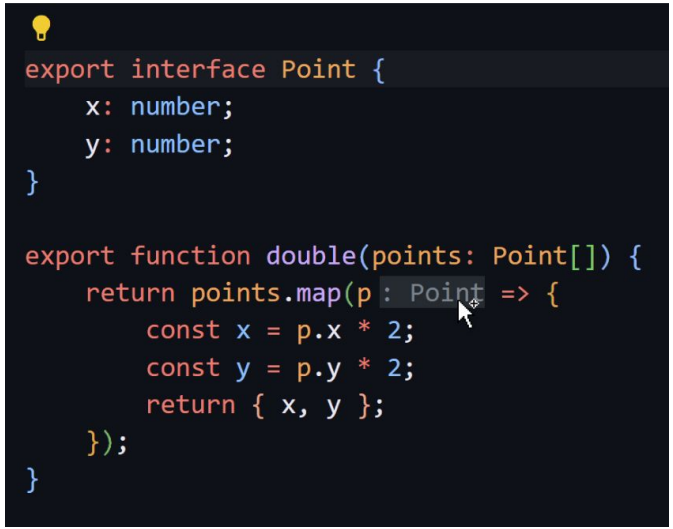
Citing reasons such as needing to perform “Type Gymnastics” (David Heinemeier Hansson) and the compiler step Typescript need to perform as reasons for moving away from it.

@use JSDoc

Latest from TypeScript

Even with the debate between JavaScript and TypeScript, TypeScript still has a bright future as they still continue to release updates for it such as TypeScript 5.3 which include things such as:

- **Import Attributes**
- **Interactive Inlay Hints for Types**
- **switch (true) Narrowing**



```
export interface Point {
    x: number;
    y: number;
}

export function double(points: Point[]) {
    return points.map(p : Point => {
        const x = p.x * 2;
        const y = p.y * 2;
        return { x, y };
    });
}
```

```
// We only want this to be interpreted as JSON,
// not a runnable/malicious JavaScript file with a `.json` extension.
import obj from "./something.json" with { type: "json" };
```

Latest from TypeScript (cont.)

```
function f(x: unknown) {
    switch (true) {
        case typeof x === "string":
            // 'x' is a 'string' here
            console.log(x.toUpperCase());
            // falls through...

        case Array.isArray(x):
            // 'x' is a 'string | any[]' here.
            console.log(x.length);
            // falls through...

        default:
          // 'x' is 'unknown' here.
          // ...
    }
}
```

Conclusion

- TypeScript's main selling point is its optional static typing which helps with detecting bugs early and helps with annotations.
- Over the years, Typescript has been able to stakes it claim in the industry with it being used by many frameworks and startups
- Even with some projects moving away from TypeScript, TypeScripts still continue to have support in the form of updates that comes with new features..

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Questions?