

TypeScript

Training Agenda

TypeScript – What & Why

Types in TypeScript

ES6+ Features

OOP in TypeScript

Generics & Decorators

Modules & Namespaces

TypeScript is JavaScript
with syntax for types.

TypeScript - Introduction

Strongly typed
programming
language

Built on
JavaScript

An optional
type system
for JavaScript.

Features from
future
JavaScript

Better tooling

Corporate
care-taker

Why TypeScript?

Safety:

- Type systems allow many errors to be caught early, without running the code.

Readability:

- Explicit types make code easier for humans to understand.

Better Tooling:

- Allows tools like IDEs and linters to be more powerful.

TypeScript – Types Overview

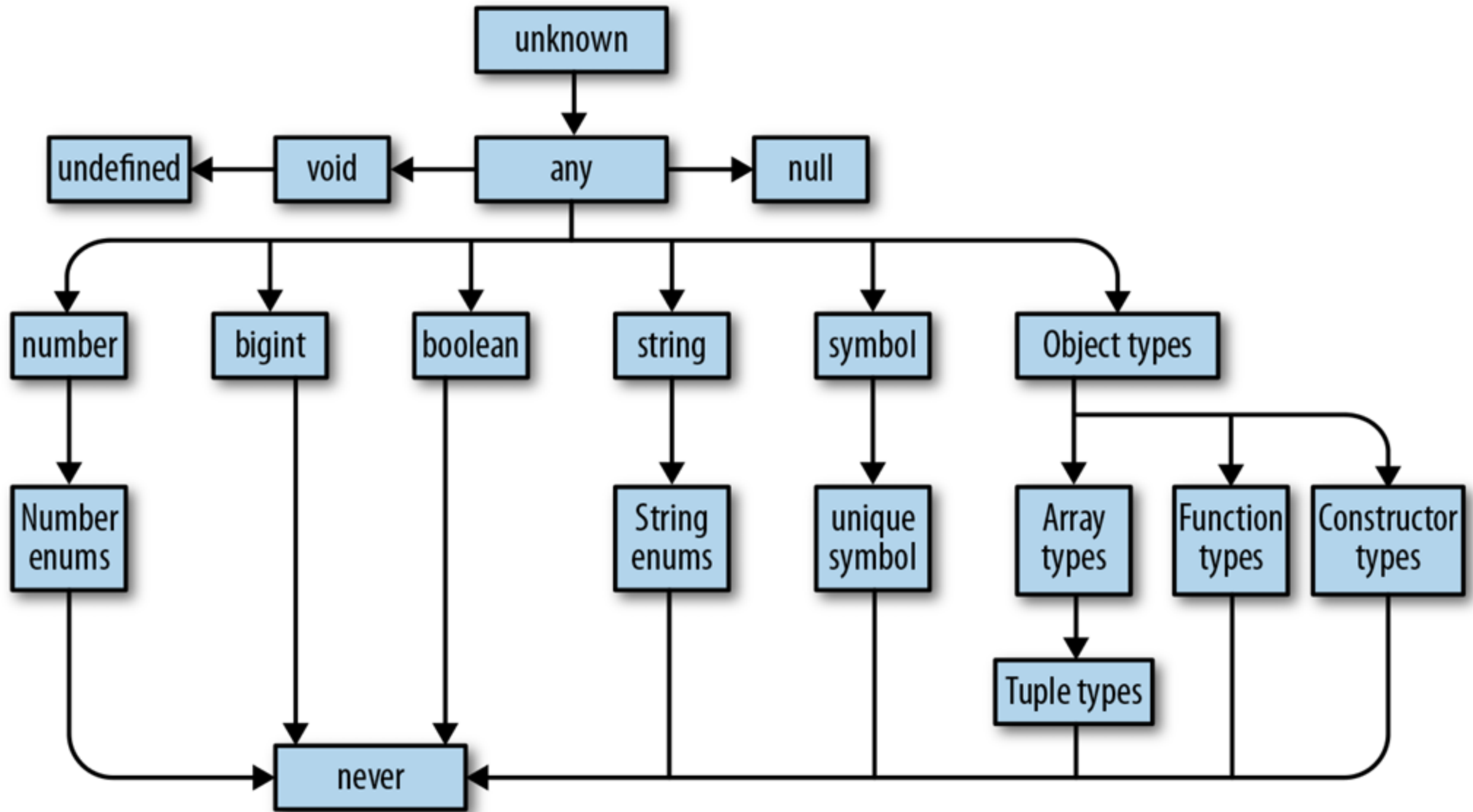
Types can be Implicit

Types can be Explicit

Types are structural

Type errors do not prevent JavaScript emit

Types can be ambient



Types that mean an absence of something

<i>null</i>	Absence of a value
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<i>undefined</i>	Variable that has not been assigned a value yet
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<i>void</i>	Function that doesn't have a return statement
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<i>never</i>	Function that never returns
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Compilation Context

The compilation context is basically just a fancy term for grouping of the files that TypeScript will parse and analyze to determine what is valid and what isn't.

A great way to define this logical grouping is using a ***tsconfig.json*** file.

ES6 Features

Block Scope

Arrow
functions

Destructuring

Rest & Spread

Default
Parameters

Template
literals

Promises

Classes

Working with Classes

- Using 'this'
- Access Modifiers
- Getters / setters
- Static properties and methods
- Method overriding
- Method overloading
- Abstract classes
- Interfaces

To-do App

- The finished application will display a list of to-do items and includes editing, deleting, and adding features.
- Create App using TypeScript Code
- Style the app as per your choice

Generics

A placeholder type used to enforce a type-level constraint in multiple places. Also known as polymorphic type parameter.

The generic types declared within the triangle brackets: `<T>`

Constrainting the generic types is done with the extends keyword:

`<T extends Car>`

Decorators

Decorators are an experimental TypeScript feature that gives us a clean syntax for metaprogramming with classes, class methods, properties, and method parameters.

They're just a syntax for calling a function on the thing you're decorating.

Modules

By default when you start typing code in a new TypeScript file your code is in a global namespace.

- Global namespace is dangerous as it opens your code up for naming conflicts.

File Module / External Module

- If you have an *import* or an *export* at the root level of a TypeScript file then it creates a local scope within that file.
- Using an *import* in file not only allows you to bring in stuff from other files, but also marks the file as a module and therefore, declarations in that file don't pollute the global namespace either.

Namespaces

Namespaces provide you with a convenient syntax around a common pattern used in JavaScript

Use *namespace* for quick demos and porting old JavaScript code.

Reference

BOOKS

TypeScript Deep Dive

- *By Barasat Ali Syed*

Learning TypeScript

- *By Stack Overflow Contributors*

WEB

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

<https://basarat.gitbook.io/typescript/>

<https://www.youtube.com/watch?v=BwuLxPH8IDs>