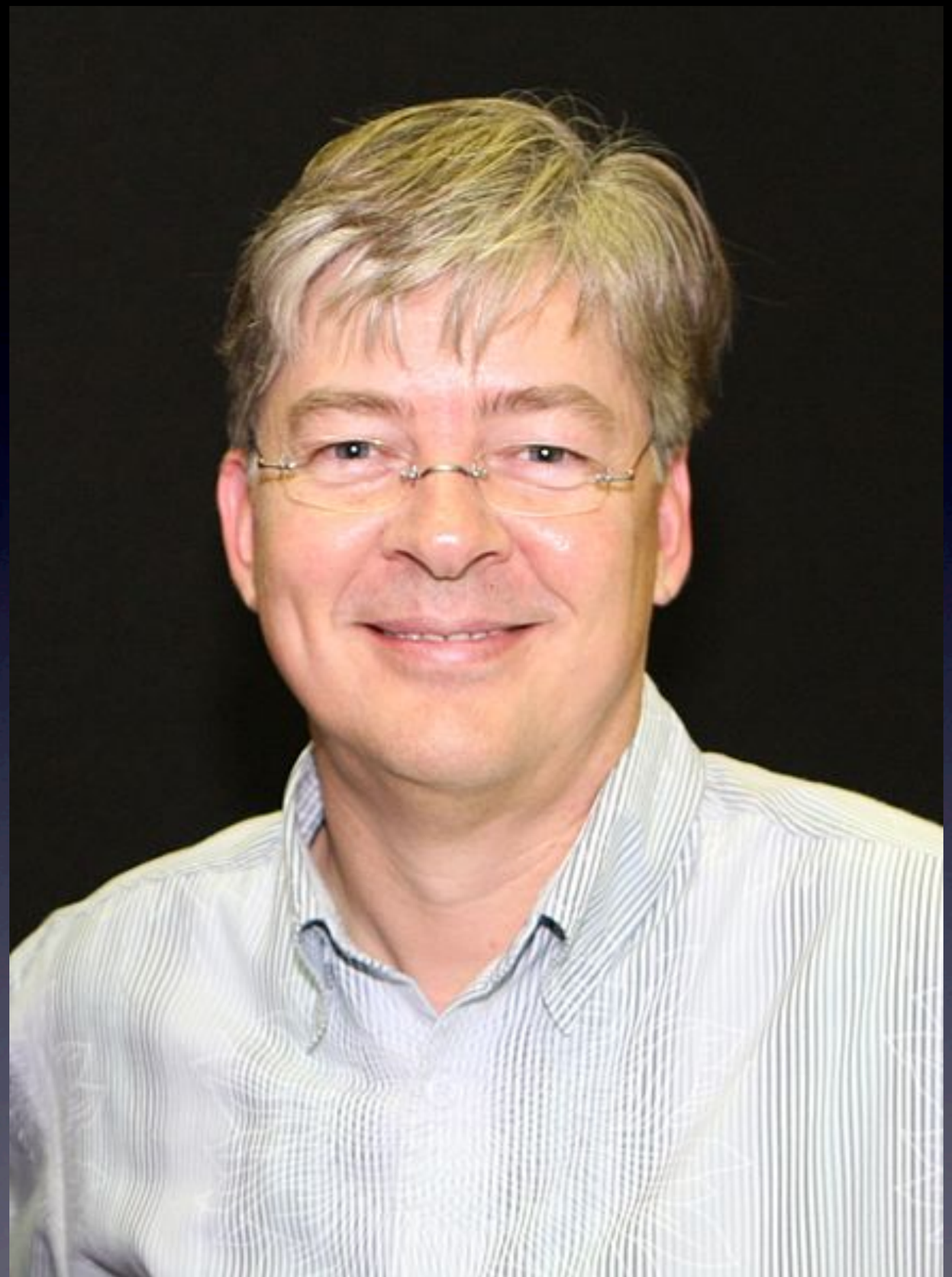
TypeScript

JaxDUG May 2013

About Us

- David Fekke
- Jyoti Chawla
- Software Engineers



Javascript
is highly unstructured
and highly functional

- [] + [];

- [] + [];
  - => “”

- [] + [];
  - => “”
- [] + {};

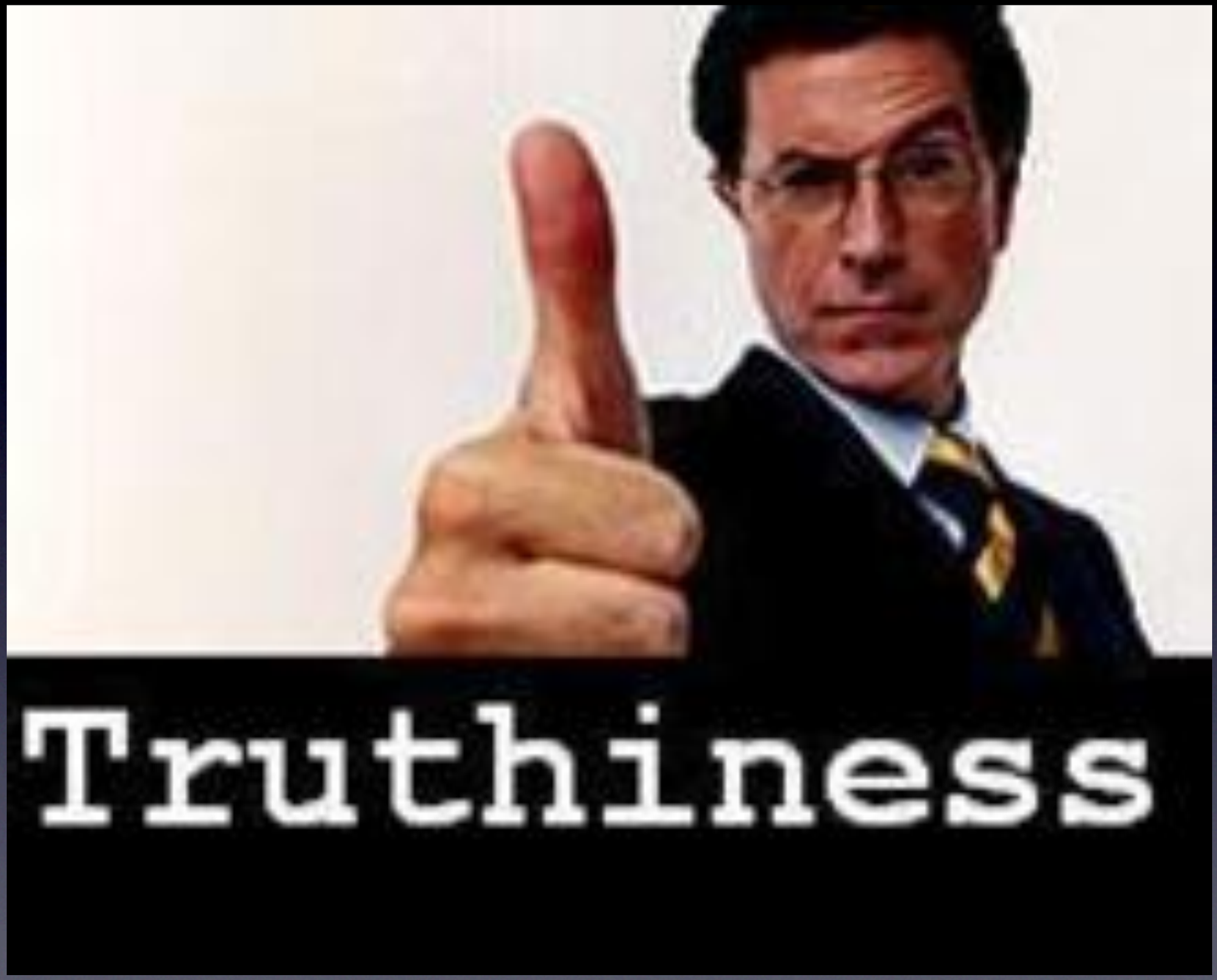
- [] + [];
  - => “”
- [] + {};
  - => [object Object]

- [] + [];
  - => “”
- [] + {};
  - => [object Object]
- {} + [];

- [] + [];
  - => “”
- [] + {};
  - => [object Object]
- {} + [];
  - => 0

- [] + [];
  - => “”
- [] + {};
  - => [object Object]
- {} + [];
  - => 0
- {} + {};

- [] + [];
  - => “”
- [] + {};
  - => [object Object]
- {} + [];
  - => 0
- {} + {};
  - => NaN


Truthiness

- false == “”

- false == “”
  - => true

- false == “”
  - => true
- false === “”

- false == “”
  - => true
- false === “”
  - => false

- false == “”
  - => true
- false === “”
  - => false
- | == “|”

- false == “”
  - => true
- false === “”
  - => false
- | == “|”
  - => true

- false == “”
  - => true
- false === “”
  - => false
- | == “|”
  - => true
- | === “|”

- false == “”
  - => true
- false === “”
  - => false
- | == “|”
  - => true
- | === “|”
  - => false

Is Javascript an Object-Oriented language?

What is TypeScript

What is TypeScript

- Based on JavaScript

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- Based on JavaScript
- Adds a Type system to JavaScript

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- Based on JavaScript
- Adds a Type system to JavaScript
- Makes Javascript Structured
- Can write trully OO Javascript

Transpiler

- Compiles down Javascript
- Dart and CoffeeScript both transpile to javascript

What is the Use Case

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- Type systems help us develop large structured applications

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- Single Page Apps

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- Node JS Apps

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- Type systems help us develop large structured applications
  - Single Page Apps
  - Node JS Apps
  - Windows Store Apps

Compiler

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- Compiler written in TypeScript

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- Runs in Node js && Visual Studio 2012

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- myapp.ts is TypeScript file

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- myapp.ts is TypeScript file
- Compiles into myapp.js

Demo

- Compiler

TypeScript features

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- Parameter types

TypeScript features

- Parameter types
- Return types

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- Return types
- Interfaces

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- Return types
- Interfaces
- Classes

TypeScript features

- Parameter types
- Return types
- Interfaces
- Classes
- Modules

```
1  var Student = (function () {
2      function Student(firstname, middleinitial, lastname) {
3          this.firstname = firstname;
4          this.middleinitial = middleinitial;
5          this.lastname = lastname;
6          this.fullname = firstname + " " + middleinitial + " " + lastname;
7      }
8      return Student;
9  })();
10 function greeter(person) {
11     return "Hello, " + person.firstname + " " + person.lastname;
12 }
13 var user = new Student("Jane", "M.", "User");
14 document.body.innerHTML = greeter(user);
15
```

```
1  class Student {
2      fullname : string;
3      constructor(public firstname, public middleinitial, public lastname) {
4          this.fullname = firstname + " " + middleinitial + " " + lastname;
5      }
6  }
7
8  interface Person {
9      firstname: string;
10     lastname: string;
11 }
12
13 function greeter(person : Person) {
14     return "Hello, " + person.firstname + " " + person.lastname;
15 }
16
17 var user = new Student("Jane", "M.", "User");
18
19 document.body.innerHTML = greeter(user);
```

Basic Types

Basic Types

- string

Basic Types

- string
- number

Basic Types

- string
- number
- bool

Basic Types

- string
- number
- bool
- any

Basic Types

- string
- number
- bool
- any
- null

Basic Types

- string
- number
- bool
- any
- null
- undefined

Parameters Types

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- Primitives and user defined

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- string, number, bool or any.

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- string, number, bool or any.
- aFunc (b: string, c: number) { }

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- accept a function

Parameters Types

- Primitives and user defined
- string, number, bool or any.
- aFunc (b: string, c: number) { }
- accept a function
- aFunc (handler: (res: string) => any) { }

Return Types

Return Types

- Return primitives or user defined types

Return Types

- Return primitives or user defined types
- function a(): string { return “”; }

Interfaces

Interfaces

- Similar to interfaces in Java and C#

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- interface IPerson { A: string; B?: string; }

Classes

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- Use “class” keyword

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- Can “extend” class or “implement” interfaces

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- Use “constructor” as constructor function
- “super” to call base functions and properties

Modules

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- Use “export” keyword to make members available

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- Modules are like packages or libraries
- Use “export” keyword to make members available
- module a { export b():string { return “”;} }

File types

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- *.ts files are typescript files

File types

- *.ts files are typescript files
- *.js files are compiled JavaScript

File types

- *.ts files are typescript files
- *.js files are compiled JavaScript
- *.d.ts files are interface representations of libraries. Helps visual studio with intellisence

Node compiler

Node compiler

- npm install -g typescript

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- tsc myfile.ts
  generates a myfile.js

Node compiler

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- tsc myfile.ts
  generates a myfile.js
- “tsc --declaration myfile.ts” creates *.d.ts

Visual Studio 2012

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- Plugin support

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- TypeScript project type

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- Add ts files to existing projects

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- Full Intellisense

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- ///<reference path="jquery.d.ts" />

```
<PropertyGroup Condition="'$(Configuration)' == 'Debug'">
    <TypeScriptTarget>ES5</TypeScriptTarget>
    <TypeScriptIncludeComments>true</TypeScriptIncludeComments>
    <TypeScriptSourceMap>true</TypeScriptSourceMap>
  </PropertyGroup>
  <PropertyGroup Condition="'$(Configuration)' == 'Release'">
    <TypeScriptTarget>ES5</TypeScriptTarget>
    <TypeScriptIncludeComments>false</TypeScriptIncludeComments>
    <TypeScriptSourceMap>false</TypeScriptSourceMap>
  </PropertyGroup>
  <Import Project="$(MSBuildExtensionsPath32)\Microsoft\VisualStudio\v$
(VisualStudioVersion)\TypeScript\Microsoft.TypeScript.targets" />
```

Add this to your VS Project, *.csprog

Demo

- TypeScript

Resources

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- typescriptlang.org

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- typescriptlang.org
- http://github.com/davidfekke/PeopleKODB

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- http://github.com/davidfekke/PeopleKODB
- http://github.com/davidfekke/tsexamples

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- typescriptlang.org
- http://github.com/davidfekke/PeopleKODB
- http://github.com/davidfekke/tsexamples
- Channel 9 interview with Anders Heljsberg

Contact

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