Interfaces

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Overview

What is an interface?

Duck typing

Declare interfaces

Interfaces for function types

Extending interfaces

Interfaces for class types

Contracts that define types

Compiler enforces the contract via type checking

Collection of property and method definitions

Duck typing

“When I see a bird that walks like a duck and swims like a duck and quacks like a duck, I call that bird a duck.”

James Whitcomb Riley

Source: https://en.wikipedia.org/wiki/Duck_test

Duck Typing

```
interface Duck {
    walk: () => void;
    swim: () => void;
    quack: () => void;
}
let probablyADuck = {
    walk: () => console.log('walking like a duck'),
    swim: () => console.log('swimming like a duck'),
    quack: () => console.log('quacking like a duck')
}
function FlyOverWater(bird: Duck) { }
FlyOverWater(probablyADuck); // works!!!
```

```
interface Book {
    id: number;
    title: string;
    author: string;
    pages?: number;

}
```

Defining an Interface

“interface” keyword

List properties with their types

```
interface Book {
    id: number;
    title: string;
    author: string;
    pages?: number;
}
```

Defining an Interface

“interface” keyword

List properties with their types

Optional properties denoted with “?”

```
interface Book {
    id: number;
    title: string;
    author: string;
    pages?: number;
    markDamaged: (reason: string) => void;
}
```

Defining an Interface

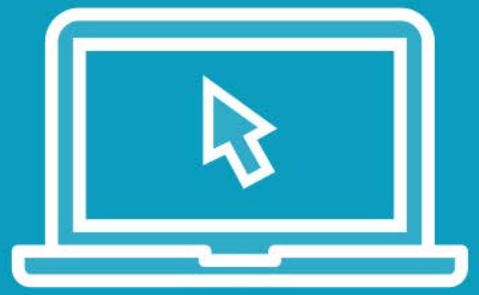
“interface” keyword

List properties with their types

Optional properties denoted with “?”

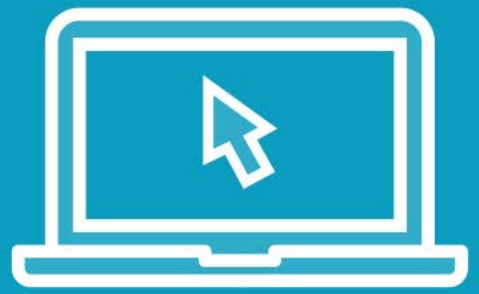
Provide function signatures – no implementation

Demo



Restructuring the LibraryManager App

Demo



Defining and using interfaces

Interfaces for Function Types

```
function CreateCustomerID(name: string, id: number): string {
    return name + id;
}
interface StringGenerator {
    (chars: string, nums: number): string;
}
let IdGenerator: (chars: string, nums: number) => string;
IdGenerator = CreateCustomerID;
```

Interfaces for Function Types

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Interfaces for Function Types

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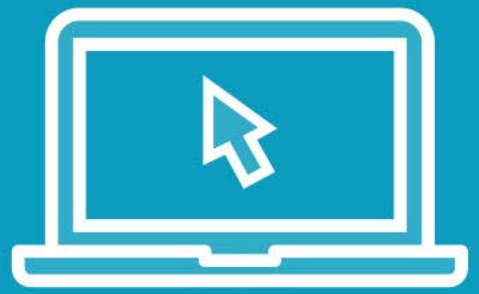
function CreateCustomerID(name: string, id: number): string {
    return name + id;
}
interface StringGenerator {
    (chars: string, nums: number): string;
}
let IdGenerator: StringGenerator;
IdGenerator = CreateCustomerID;
```

Demo



Interfaces for function types

Extending Interfaces

```
interface LibraryResource {
    catalogNumber: number;
}
interface Book {
    title: string;
}
interface Encyclopedia extends LibraryResource, Book {
    volume: number;
}
```

Extending Interfaces

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    catalogNumber: number;
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interface Book {
    title: string;
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    volume: number;
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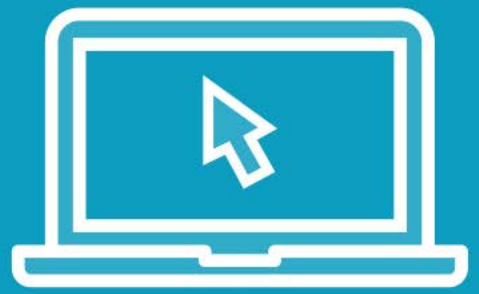
Extending Interfaces

```
interface LibraryResource {
    catalogNumber: number;
}
interface Book {
    title: string;
}
interface Encyclopedia extends LibraryResource, Book {
    volume: number;
}
```

```
let refBook: Encyclopedia = {
    catalogNumber: 1234,
    title: 'The Book of Everything',
    volume: 1
}
```

Demo

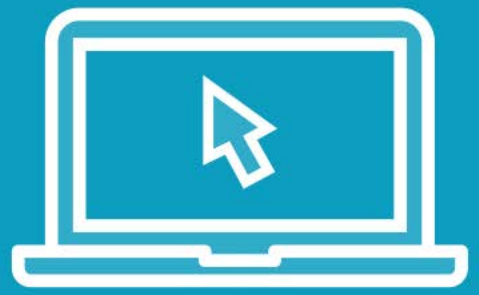


Extending interfaces

Class Types

```
interface Librarian {
    doWork: () => void;
}
class ElementarySchoolLibrarian implements Librarian {
    doWork() {
        console.log('Reading to and teaching children...');
    }
}
let kidsLibrarian: Librarian = new ElementarySchoolLibrarian();
kidsLibrarian.doWork();
```

Demo



Implementing interfaces with classes

Summary

- Interfaces and type checking
- Duck typing
- Declare and use interfaces
- Extend interfaces
- Implement interfaces with classes