Namespaces and Modules

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#typescript

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Intro to Namespaces

Definition

- Namespaces are used to **logically grouped** functionalities
- Previously referred as **internal modules** in TypeScript
- Defined with **namespace** keyword
- Namespaces may include **functions**, **classes**, **interfaces** and **variables**

Access

- The elements of the namespace that must be accessed from the outside must be marked with **export** keyword
- In order to access namespaces from different files we must use the reference syntax
  /// <reference path = "file.ts" />

Example: Namespace

```
namespace printMessages {
    export function messenger(message: string | string[])
{
        return `${message}`;
    }
    export interface meetPerson {
        meetPerson(): string
    }
}
console.log(printMessages.messenger('Hello')); //Hello
```

namespace declaration

export to use the interface outside

Multiple Files Namespaces

- In order to access namespaces from different files we must use the reference syntax
  /// <reference path = "file.ts" />
- In order to compile the file we must
  - Compile the ts file - **tsc fileName.ts**
  - Use the outFile - **tsc --outFile fileName.js fileName.ts**
  - Compile the js file - **node fileName**

Aliases

- Used to simplify the work with namespaces
- Used with **import** keyword
- Often used as nested namespaces

```
namespace Shops {
    export namespace TechStores {
        export class PCStore {}
        export class AudioStore {}
        export class TVStore {}
    }
}
--Name of file - app.ts
import stores = Shops.TechStores;
let pcStore = new stores.PCStore();
```

Intro to Modules

Definition

- Modules are executed in their **own scope**, not the global
- A **set of functions** to be included in applications
- Resolve name collisions
- In order to be accessed from the outside they need to be marked with **export** keyword

Access

- To consume a function, class, interface or variable exported from another module we must use an **import** form
  - **import** { name } from "./location" - import specific element
  - **import** * as variable from "./location"; - imports the entire module in single variable

Exporting and Importing

Export Statements

- There are three ways to use **export** statements:
  - A:
    ```
    export function numberValidation(num: number): number {…}
    ```
  - B:
    ```
    export { numberValidation };
    ```
  - C:
    ```
    export { numberValidation as isValidNum }; //isValidNum is alias
    ```
  - D:
    ```
    export default function stringValidations(string: string): string {…}
    ```
- In cases **A** and **B** there is **no difference** rather than syntax
- There might be only one **export default** in a file

Example: Export and Import Statements

```
--exports
export default function checkInput<T>(information: T): T {
    if (information) { return information; }
    else { throw new Error('The information passed is not valid') }
}
export function stringValidations(string: string): string {
    if (string.length > 0 && string.length <= 20) { return string; }
    else { throw new Error('String is not valid'); }
}
export function numberValidation(num: number): number {
    if (num > 0 && num <= 999) { return num; }
    else { throw new Error('Number is not valid'); }
}
export { numberValidation as isValidNum };
```

Import Statements and File Compilation

```
--Imports
import * as validations from './validations';
//validations is alias
import checkInput from "./validations";
import { isValidNum } from "./validations";

// Some code logic
```

- In order to compile the file we must
  - Compile the ts file - **tsc fileName.ts**
  - Use the outFile - **tsc --module commonjs fileName.ts**
  - Compile the js file - **node fileName**

Namespaces vs Modules

Namespaces vs Modules

- Namespaces: Global containers for code organization.
- Enclosed using namespace keyword.
- Can be split across multiple files but combined during compilation.
- Can contain variables, interfaces, functions, classes, etc.

```
namespace Shapes{
    export interface Circle {
        radius: number;
    }
}
```

Namespaces vs Modules

- Modularize code into separate files.
- Enclosed using export and import keywords.
- Are more file-based and can be loaded asynchronously.
- Can contain variables, functions, classes, etc., but not directly at the root level.

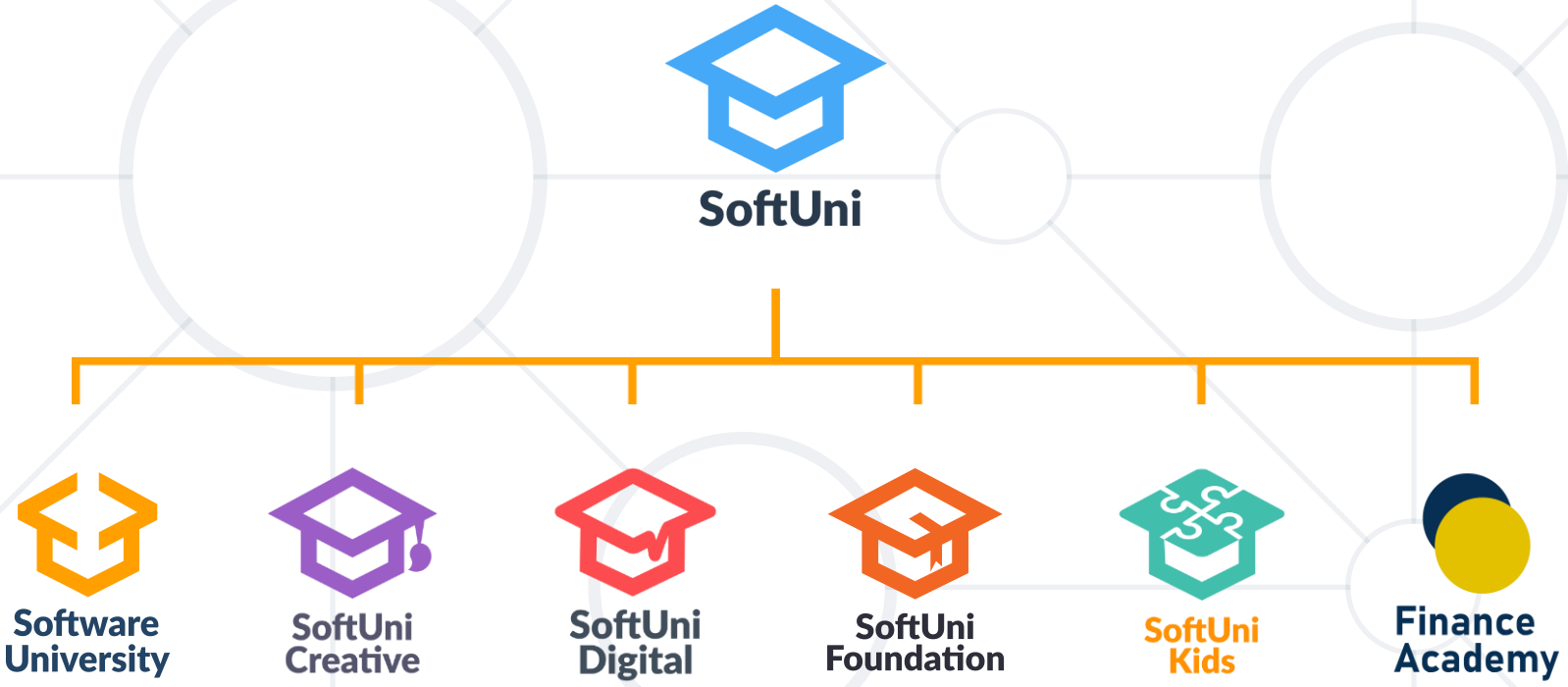
```
export interface Circle {
    radius: number;
}

import { Circle } from ‘./circle’;
```

Summary

- Namespaces are **logically grouped** functionalities
- Modules are a **set of functions** to be included in applications
- Modules do not **pollute the global scope**

Questions?



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