

CMSC388A

Web Application Development with JavaScript



Maps, Form Validation, Classes

Department of Computer Science

University of MD, College Park

Slides material developed by Ilchul Yoon, Nelson Padua-Perez

Maps

- Collection of key - value pairs
- Keys and values can be primitive or references
- Can define a map via iterable over key-value pairs
- **keys()** - method returns iterable for keys in the map
- **values()** - method returns iterable for values in the map
- **entries()** - method returns iterable over (key, value) pairs
- **Example:** Map.html

WeakMaps

- A collection of key-value pairs
 - **In which primitive data types are not allowed as keys**
- The **keys** must be objects
- The **values** can be arbitrary values
- **Key is weakly held; if the object representing a key is the only reference to the object, the object will be garbage-collected**
- **You cannot iterate over keys, values, or entries**
- You need a key to get some content out of the map
- **Example:** WeakMap.html
 - As defined, the example relies on a Map
 - Run the example in Chrome, select **Inspect**, and under the **Memory** option, select "Heap Snapshot", and select the "Take snapshot" button at the end
 - Search for "TerpObject" in the **Constructor** column
 - Repeat the above process, but using a WeakMap rather than a map
- **Uses - to define private data in a "class"**

Immediately Invoked Function Expression (IIFE)

- **IIFE** - approach to define a function so it gets invoked immediately
 - It does not have a name, and it is self-executing
- **Two parts**
 - Anonymous function with lexical scope enclosed within the grouping operator ()
- **IIFE** - Prevents accessing variables within the IIFE idiom as well as polluting the global scope
- Emulates block-scoped variables
- Not needed if “let” is used instead of “var”
- **Example:** IIFE.html

Form Validation

- Form data validation
 - We can validate the data associated with a form by recognizing the submit event
 - **window.onSubmit = validateData;**
 - » **validateData** is a function that will check for data validity
 - » It will return true or false
- Keep in mind that JavaScript can be disabled therefore, the server application must also validate the data
- Notice the organization code (HTML, CSS, JS separate) in the example
- **Example:** FormValidation

Class Declaration

- **Basic syntax**

```
class MyClass {  
    constructor(args) { ... }  
    method1() { ... } /* methods are non-enumerable */  
    method2() { ... }  
}
```

- **Usage**

```
let c = new MyClass(args);  
c.method1();
```

- **new MyClass()** to create a new object
- **constructor** method is automatically called by **new**
 - **Used to create and initialize a new object**
 - **Only one constructor is allowed**

Static Properties and Methods

- **Private variables** - defined using #
- **Static properties**
 - Belongs to the class itself
 - Add **static** in front of the variable's name
- **Static methods**
 - Assign a method to the class itself
 - Add **static** in front of the method's name
- **Example:** ClassDeclaration.html
- The class's body is in strict mode
- Class declarations and class expressions are in strict mode

Class Declarations are NOT Hoisted

- **function declarations** are hoisted
- **class declarations** are **NOT** hoisted
 - Declare your class first and then access it
 - Otherwise, code like the following will throw a ReferenceError

```
const p = new Rectangle(); // ReferenceError
```



```
...
```

```
class Rectangle {}
```


Getters and Setters

- Getters/setters can be used as wrappers over “real” property values
 - **get** - binds an object property to a function that will be called when that property is looked up
 - **set** - binds an object property to a function to be called when there is an attempt to set that property
- **getPropName and setPropName vs. getter/setter syntax**
 - Your preference
- **Example:** Car.html

Class Inheritance

- “**extends**” keyword used to define inheritance relationship
- **Syntax**
 class X extends Y { ... }
- **Example:** SportsCar.html

Method Overriding

- **Overriding constructor**

- constructors in a child class must call **super(...)** before **using this** in order to override constructor
- `super(...)` is only allowed in the constructor

- If not overridden, the following will be created for you

```
constructor(...args) {  
    super(...args);  
}
```

- **Overriding non-constructor methods**

- Simply define a method with the same name in a child class. It will shadow the parent's method
- **super.method(...)** to call a parent method

References

- <https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Classes>