Data Encapsulation in ES5

This lesson explains the steps to protect properties and teaches us how to access these protected properties.

WE'LL COVER THE FOLLOWING

Hiding Data

Till now, all the constructor function properties were easily accessible outside of it, and their values could be modified without any restrictions. In both ES5 and ES6 versions of JavaScript, there is no formal support for access modifiers using *keywords* such as `public`, `private` or `protected`. By default, all properties are public; hence, they can easily be accessed.

Let's discuss property protection for the ES5 version. We will look at the ES6 version later on in the course.

Before we get into details, let's take a look at the following term:

> **internal property**: a *property* or *method* that can only be accessed by methods present *inside* the *constructor* function.

An *internal property* can then be considered protected from being accessed in an unauthorized manner.

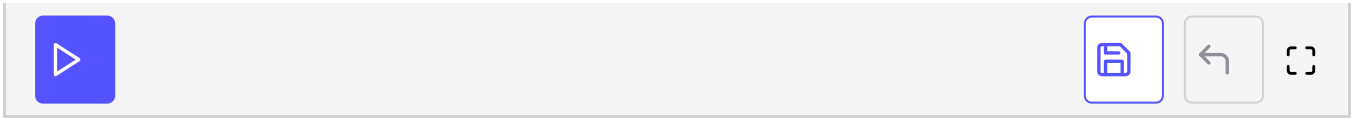
Example

Let's start by taking a look at how properties were being defined inside the constructor function previously:

```
//function constructor called Employee
function Employee(name, age, designation){
  this.name = name
  this.age = age
  this.designation = designation
}

//creating an object called employeeObj
var employeeObj = new Employee('Joe', 22, 'Developer')

//displaying properties of employeeObj
console.log("Name of employee:",employeeObj.name)
console.log("Age of employee:",employeeObj.age)
console.log("Designation of employee:",employeeObj.designation)
```



Now let's follow the steps below in order to modify the code above and provide protection to the properties.

Steps

- remove `this`
- declare the properties using `var` keyword instead
- add leading `_` to the names of the *properties*

Using *underscore* is a convention followed by programmers to indicate that such properties should not be accessed from outside.

Time to convert the properties into *internal properties*!

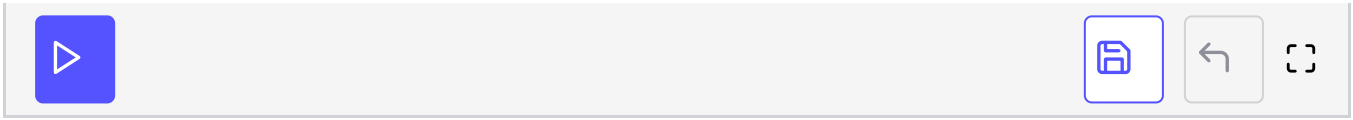
```
//function constructor called Employee
function Employee(name, age, designation){
  //declaring properties using "var" keyword to protect them
  var _name = name
  var _age = age
  var _designation = designation
}
```

Protecting properties

The use of `var` declares the *properties* locally; hence they cannot be accessed directly from the outside. Try running the code below:

```
//constructor function called Employee
function Employee(name, age, designation){
  var _name = name

  var _age = age
  var _designation = designation
}
var employeeObj = new Employee('Joe',20,'Chef')
//accessing properties outside
console.log(employeeObj._name)
console.log(employeeObj._age)
console.log(employeeObj._designation)
```



Protecting properties

The code above displays `undefined` when property values are accessed. The code tries to retrieve values of the local variables from the `employeeObj` instance created. However, since all values are stored in local variables, only the functions inside the *constructor function* will be able to access them.

Accessing Protected Properties

So how will the internal properties be accessed outside of `Employee`?

Get/Set functions can be used to retrieve these property values as well as set them. These functions were discussed previously as well. They will be declared as public functions inside `Employee` due to which they will have access to the internal properties.

Example

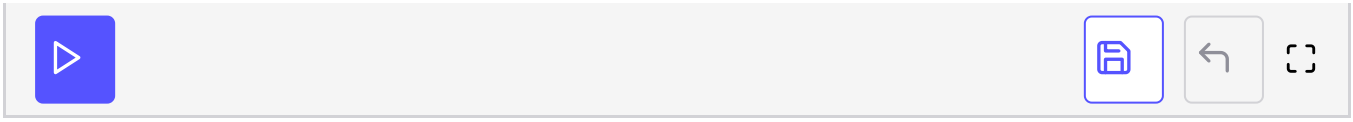
Let's implement the *get/set* functions in order to retrieve as well as set the internal property values outside the constructor function.

> **Note:** The method to declare a *get/set* function is the same as that of any other function being declared inside a *constructor* function.

```
//constructor function called Employee
function Employee(name, age, designation){
  var _name = name
  var _age = age
  var _designation = designation
  //defining the get function
  this.getName = function() {
```

```
    return _name
  }
  this.getDesignation = function() {

    return _designation
  }
  //defining the set function
  this.setDesignation = function(desig) {
    _designation = desig
  }
}
var employeeObj = new Employee('Joe',20,'Chef')
//calling the getName function
console.log("Name of the employee is:", employeeObj.getName())
//calling the setDesignation function
employeeObj.setDesignation('Developer')
//calling the getDesignation function
console.log("New designation is:",employeeObj.getDesignation())
```



Accessing Protected Properties

As seen in **lines 8, 11** and **15** *property* values are being accessed directly by the functions since they are defined inside `Employee`. These functions are then accessed/called outside in order to get/set the values of the properties.

Now that you're familiar with *constructor functions*, let's test that knowledge with a quiz in the next lesson.