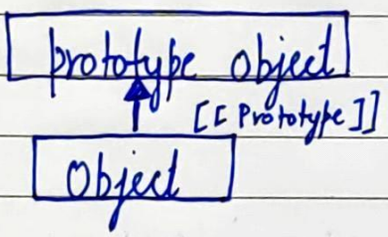
Chapter 11 - Object Oriented Programming

In programming we often take something and then extend it. for example we might want to create a user object and "admin" and "guest" will be slightly modified variants of it

[[Prototype]]

JavaScript objects have a special property called prototype that is either null or references another object



When we try to read a property from a prototype and its missing, JavaScript automatically takes it from the prototype. This is called "prototypal inheritance"

Setting Prototype

We can set prototype by setting __proto__

Now if we read a property from the object which is not in object and is present in the prototype, JavaScript will take it from prototype

If we have a method in object, it will be called from the object. If its missing in object and present in prototype, its called from the prototype

Classes and Objects

In object-oriented programming, a class is an extensible program-code template for creating objects, providing initial values for state (member variables) and implementation of behavior (member functions)

The basic syntax for writing a class is :

```
Class MyClass {
    // class methods
    constructor() { ... }
    method1() { ... }
    method2() { ... }
    }
```

We can then use new MyClass() to create a new object with all the listed methods

The Constructor method

The Constructor() method is called automatically by new, so we can initialize the object there

Quick Quiz : Create a class user and create a few methods along with a constructor.

Class Inheritance

Class Inheritance is a way for one class to extend another class. This is done by using the extends keyword.

The extends keyword

extends keyword is used to extend another class.

```
class Child extends Parent
```

We can create a class Monkey that inherits from Animal

```
class Monkey extends Animal {
    hide() {
        alert(`${this.name} hides!`);
    }
}

let monkey = new Monkey("Monu")
monkey.run(7); // From Animal
monkey.hide();
```

Method Overriding

If we create our own implementation of run, it will not be taken from the Animal class. This is called Method Overriding

super keyword

When we override a method, we dont want the method of the previous class to go in vain. We can execute it using super keyword.

```
super(a, b)
```

→ call parent constructor

```
run () {
    super. run ( )
    this. hide ( )
    }
```

Overriding Constructor

With a constructor, things are a bit tricky / different According to the specification, if a class extends another class and has no constructor, then the following empty constructor is generated

```
Class Monkey extends Animal {
    // auto generated
    Constructor (... args) {
        super (... args);
    }
}
```

=> Happens if we dont write our own Constructor

Constructors in inheriting classes must call super (...) and do it before using this.

We can also use super. method ( ) in a Child method to call Parent Method

Static method

Static methods are used to implement functions that belong to a class as a whole and not to any particular object

We can assign a static method as follows:

```
Class Employee {
    static sMethod () {
        alert ("Hey");
    }
}
Employee.sMethod()
```

Static methods arent available for individual objects

Getters and Setters
Classes may include getters and setters to get & set the computed properties

Example:

```
class Person {
    ...
    get (name) {
        return this._name;
    }
    set name (newName) {
        this._name = newName;
    }
```

First the name property is changed to _name to avoid the name collision with the getter & setter. Then the getter uses the get keyword as shown above

instanceof Operator

The instanceof operator allows to check whether an object belongs to a certain class

The syntax is :

<obj> instanceof <class>

It returns true if obj belongs to the Class or any other class inheriting from it