# SNS COLLEGE OF ENGINEERING

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## DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

**Course Code and Name : 19TS601 FULL STACK DEVELOPMENT**

**Unit 1 :** JAVASCRIPT AND BASICS OF MERN STACK

**Topic :** Objects

# Objects

- object is an entity having state and behavior (properties and method).
- An **object** is a collection of related data and functionality, organized as **key-value pairs**.
- For example: car, pen, bike, chair, glass, keyboard, monitor etc.
- JavaScript is an object-based language. Everything is an object in JavaScript.
- JavaScript is template based not class based. Here, we don't create class to get the object. But, we direct create objects.

# Creating Objects in JavaScript

Syntax:

```
let objectName = {
 key1: value1,
 key2: value2,
 key3: value3,
 // Methods (functions inside objects)
method1: function()
{
console.log("This is a method");
} };
```

# For example

```
let car = {
 brand: "Toyota",
 model: "Corolla",
year: 2020,
color: "blue",
start: function()
{
console.log("The car has started");
}
};
```

```
// Accessing properties
console.log(car.brand); // Output: Toyota
console.log(car["model"]); // Output: Corolla
// Updating a property
car.color = "red";
console.log(car.color); // Output: red
// Calling a method
car.start(); // Output: The car has started
```

# Properties

- A property is a key-value pair where the key is a string (or symbol) and
- The value can be any data type (string, number, array, object, etc.).
- Example:

```
let person = { name: "John", age: 25 };
```

# Methods

- A method is a function associated with an object.
- Example:

```
let person = {
greet: function()
{
    console.log("Hello!");
 }
};person.greet(); // Output: Hello!
```

## Accessing Object Properties:

- Dot notation: objectName.key
- Bracket notation: objectName["key"]

**Nested Objects:**

An object can contain another object.

Example:

```
let employee = {  name: "Alice",
 department: {
 name: "Engineering",
location: "Building A"  }
};
```

console.log(employee.department.name); // Output: Engineering

Adding and Deleting Properties:

Add a property:

car.fuel = "petrol";

Delete a property:

delete car.fuel

this Keyword:

Refers to the object it belongs to.

Example:

```
let person = {
 name: "John",
greet: function()
{
console.log("Hi, I'm " + this.name);
}
};person.greet(); // Output: Hi, I'm
```

# Real-World Use Case:

Objects are fundamental in JavaScript and are widely used in:

- Modeling data (e.g., user profiles, products).
- Creating reusable components (e.g., car, person).
- Manipulating DOM elements in web.

# Creating Objects in JavaScript

- There are 3 ways to create objects.
  - By object literal
  - By creating instance of Object directly (using new keyword)
  - By using an object constructor (using new keyword)

# JavaScript Object by object literal

- The syntax of creating object using object literal is given below:
- object={property1:value1,property2:value2.....propertyN:valueN}
- property and value is separated by : (colon).

simple example of creating object in JavaScript.

```
<script>
emp={id:102,name:"Shyam Kumar",salary:40000}
document.write(emp.id+" "+emp.name+" "+emp.salary);
</script>
```

**Output of the above example**

- 102 Shyam Kumar 40000

# By creating instance of Object

- The syntax of creating object directly is given below:

var objectname=new Object();

Here, **new keyword** is used to create object.

the example of creating object directly.

```
<script>
var emp=new Object();
emp.id=101;
emp.name="Ravi Malik";
emp.salary=50000;
document.write(emp.id+" "+emp.name+" "+emp.salary);
</script>
```

**Output of the above example**

101 Ravi 50000

# By using an Object constructor

- To create function with arguments. Each argument value can be assigned in the current object by using this keyword.
- The **this keyword** refers to the current object.

The example of creating object by object constructor is given below.

```
<script>
function emp(id,name,salary){
this.id=id;
this.name=name;
this.salary=salary;
}
e=new emp(103,"Vimal Jaiswal",30000);
document.write(e.id+" "+e.name+" "+e.salary);
</script>
```

**Output of the above example**

103 Vimal Jaiswal 30000

# Defining method in JavaScript Object

We can define method in JavaScript object.

But before defining method, we need to add property in the function with same name as method.

The example of defining method in object is given below.

```
<script>
function emp(id,name,salary){
this.id=id;
this.name=name;
this.salary=salary;
this.changeSalary=changeSalary;
```

```
function changeSalary(otherSalary)
{
this.salary=otherSalary;
}
}
e=new emp(103,"Sonoo Jaiswal",30000);
document.write(e.id+" "+e.name+" "+e.salary);
e.changeSalary(45000);
document.write("<br>"+e.id+" "+e.name+" "+e.salary);
</script>
```

## Output of the above example

103 Sonoo Jaiswal 30000

103 Sonoo Jaiswal 45000

# JavaScript Object Methods

- The various methods of Object are as follows:

| S.No | Methods | Description |
|---|---|---|
| 1 | Object.assign() | This method is used to copy enumerable and own properties from a source object to a target object |
| 2 | Object.create() | This method is used to create a new object with the specified prototype object and properties. |
| 3 | Object.defineProperty() | This method is used to describe some behavioral attributes of the property. |
| 4 | Object.defineProperties() | This method is used to create or configure multiple object properties. |
| 5 | Object.entries() | This method returns an array with arrays of the key, value pairs. |

| S.No | Methods | Description |
|---|---|---|
| 6 | Object.freeze() | This method prevents existing properties from being removed. |
| 7 | Object.getOwnPropertyDescriptor() | This method returns a property descriptor for the specified property of the specified object. |
| 8 | Object.getOwnPropertyDescriptors() | This method returns all own property descriptors of a given object. |
| 9 | Object.getOwnPropertyNames() | This method returns an array of all properties (enumerable or not) found. |
| 10 | Object.getOwnPropertySymbols() | This method returns an array of all own symbol key properties. |

| S.No | Methods | Description |
|---|---|---|
| 11 | Object.getPrototypeOf() | This method returns the prototype of the specified object. |
| 12 | Object.is() | This method determines whether two values are the same value. |
| 13 | Object.isExtensible() | This method determines if an object is extensible |
| 14 | Object.isFrozen() | This method determines if an object was frozen. |
| 15 | Object.isSealed() | This method determines if an object is sealed. |

| S.No | Methods | Description |
|---|---|---|
| 16 | Object.keys() | This method returns an array of a given object's own property names. |
| 17 | Object.preventExtensions() | This method is used to prevent any extensions of an object. |
| 18 | Object.seal() | This method prevents new properties from being added and marks all existing properties as non-configurable. |
| 19 | Object.setPrototypeOf() | This method sets the prototype of a specified object to another object. |
| 20 | Object.values() | This method returns an array of values. |


1.Define Object.

**Text Book:**

1.Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, A Press Publisher, 2019.

**Reference:**

David Flanagan, “Java Script: The Definitive Guide”, O’Reilly Media, Inc, 7 th Edition, 2020

2. Matt Frisbie, “Professional JavaScript for Web Developers” Wiley Publishing, Inc, 4th Edition, ISBN: 978-1-119-36656-0, 2019


Thank
You!