JAVASCRIPT

Objects and Object Oriented Programming

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Course Guide for
Starter Guide to OOP JavaScript Objects

Course instructor : Laurence Svekis - providing online training to over 500,000 students across hundreds of courses and many platforms.

What are objects - in JavaScript

When it comes to writing code there are mays ways to create a solution.

object is a collection of properties, and a property is an association between a name (key) and a value. A property's value can be a function, in which case the property is known as a method.

Object Literal notation

Objects contain data and can use that data to return results.

```
// Literal notation
var myObj1 = {
    stuff: "yes"
    , greet: "hello"
};


const person = {
            first: "Laurence"
            , last: "Svekis"
            , id: 100
            , details: function () {
                return `${this.last}, ${this.first} id#${this.id}`
            }
        }
```

```
> person.details()
"Svekis, Laurence id#100"
```

TRY IT

Create an object that reflects a car.

Add Color, make, model, price, year then for bonus points add a few methods like drive and park. Output to console.

```
> myCar
< ▶ {color: "Black", brand: "Ford", make: "Mustang", price: 50000, year: 1965, …}
> myCar.drive()
  I'm driving Mustang, vrooom vrooom                    oopjs.html:30
```

```
const myCar = {};
myCar.color = "Black";
myCar.brand = "Ford";
myCar.make = "Mustang";
myCar.price = 50000;
myCar.year = 1965;
myCar.drive = function () {
    console.log("I'm driving " + this.make + ", vrooom vrooom");
}
myCar.park = function () {
    console.log("parking the car");
}
```

Solution Car object

```
const myCar1 = {
    color: "red"
    , model: "mustang"
    , company: "ford"
    , year: 2012
    , price: 50000
 };

 console.log(myCar1.model);
 console.log(myCar1['model']);
 const temp = 'color';
 console.log(myCar2[temp]);
```

Output Object Data Dot notation and Bracket notation

```
var myObj = {
    "people": [     {
        "firstName": "Mike"
        ,       "lastName": "Smith"
        ,       "age": 30
    },              {
        "firstName": "John"
        ,       "lastName": "Jones"
        ,       "age": 40
    }]
};
 for (let i = 0; i < myObj.people.length; i++) {
    console.log(myObj.people[i].firstName + " " + myObj.people[i].lastName);
 }
 myObj.people.forEach(function (item) {
    console.log(item.firstName + " " + item.lastName);
 })
 for (let prop in myObj.people) {
    console.log(prop);
    console.log(myObj.people[prop].firstName + " " + myObj.people[prop].lastName);
 }
```

Object Data iterating contents

```
<body>
   <script>
      var myObj = {
         "people": [      {
            "firstName": "Mike"
            ,         "lastName": "Smith"
            ,         "age": 30
      },        {
            "firstName": "John"
            ,         "lastName": "Jones"
            ,         "age": 40
      }]
      };
      myObj.people.forEach(function (item) {
         console.log(item.firstName + " " + item.lastName);
         let div = document.createElement('div');
         div.innerHTML = `<h3>${item.firstName}</h3>${item.lastName}`;
         div.style.border = "1px solid #ddd";
         div.style.display = "inline-block";
         div.style.width = "100px";
         document.body.appendChild(div);
      })
   </script>
</body>
```

Creating Elements using Object Information to output content on web pages.

Challenge #1 Shopping CART

1. Create an array that contains a typical selection of items you might find going shopping.
2. Create JavaScript code to output it on the page as divs.
3. Add an event listener that when clicked adds the selected item to a global object and updating the quantity if the item is already there.
4. Create a method within the new object that calculates the subtotal

*You can add styling as needed to make it look nice :)

Milk	Apple	Bread	Butter
$5	$1	$2	$3

```
const items = [{
        item: "Milk"
        , id: 0
        , cost: 5
            }
            , {
        item: "Apple"
        , id: 1
        , cost: 1
            }
            , {
        item: "Bread"
        , id: 2
        , cost: 2
            }
            , {
        item: "Butter"
        , id: 3
        , cost: 3
            }

        ]
```

```
var cart = {};
items.forEach(function (ele) {
    let div = document.createElement('div');
    div.innerHTML = `<h3>${ele.item}</h3>$${ele.cost}`;
    div.val = ele.id;
    div.addEventListener('click', function () {
        let namer = ele.item.toLowerCase();
        if (!cart[namer]) {
            cart[namer] = {
                name: ele.item
                , price: ele.cost
                , qty: 1,
                subtotal: function(){
                    return this.price * this.qty
                }
            }
        }
        else {
            cart[namer].qty++;
        }
    })
    div.style.border = "1px solid #ddd";
    div.style.display = "inline-block";
    document.body.appendChild(div);
})
```

Challenge #1 Shopping CART (part 2)

1. Add a cart on your page so that selected items are visible.
2. Update it as new items are added
3. Add a total to the bottom

*Go shopping and enjoy.

```
const output = document.createElement('div');
document.body.appendChild(output);
items.forEach(function (ele) {
    let div = document.createElement('div');
    div.innerHTML = `<h3>${ele.item}</h3>$${ele.cost}`;
    div.val = ele.id;
    div.addEventListener('click', function () {
        let namer = ele.item.toLowerCase();
        if (!cart[namer]) {
            cart[namer] = {
                name: ele.item
                , price: ele.cost
                , qty: 1,
                subtotal: function(){
                    return this.price * this.qty
                }
            }
        }
        else {
            cart[namer].qty++;
        }
        relist();
    })
})
```

```
function relist() {
    output.innerHTML = "";
    console.log(cart);
    let total = 0;
    for (let pro in cart) {
        let subTotal = cart[pro].subtotal();
        total += subTotal;
        output.innerHTML += `${cart[pro].name} $${cart[pro].price} x
${cart[pro].qty} = $${subTotal}<br>`
        console.log(pro)
    }
    output.innerHTML += `$${total}`;
}
```

Shopping Cart - #1

JavaScript Object Oriented Programming OOP

Objects are used to model and organize code. Grouping similar items and tasks into what is known as a class.

It provide more flexibility and easier to extend on.

Class - it is the blueprint a template definition of an objects properties and methods.

JavaScript Object Constructor notation

Uses class and new to construct the object. This makes it easier to make many objects using the blueprint.

```
// Literal notation
var myObj1 = {
    stuff: "yes"
    , greet: "hello"
};
// Constructor notation
function Blueprint() {
    this.stuff = "yes";
    this.greet = "hello";
};
var myObj2 = new Blueprint();
var myObj3 = new Blueprint();
```

```
> myObj2
  ▶ Blueprint {stuff: "yes", greet: "hello"}
> myObj3
  ▶ Blueprint {stuff: "yes", greet: "hello"}
> myObj1
  ▶ {stuff: "yes", greet: "hello"}
```

Constructor functions

Creating a new object using a function. The constructor function is JavaScript's version of a class.

Nothing is returned it defines properties and methods

this keyword : name property will be equal to the name value passed to the constructor call, important tso they have their own values.

```
<script>
    function Person(firstName, lastName) {
        this.first = firstName;
        this.last = lastName
        this.greeting = function () {
            console.log(`Hello ${this.first} ${this.last}`)
        };
    }
    const tester = new Person('Laurence', 'Svekis');
    console.log(tester.first);
    tester.greeting();
</script>
```

TRY IT :

- Create several different objects using the constructor function.
- Invoke the greeting for each

TRY IT

Its back.. But now use the function to construct the object. Make a few cars…… Honda and Mustang and more if you want. It's easy :)

Also add a sell method that returns the minimum what you want to sell it based on 90% of the price. Output should match the sample.

```
> honda.sell()
  I want at least $40500 for the Accord I paid 45000
< undefined
> mustang.drive()
  I'm driving Ford Mustang, vrooom vrooom
< undefined
> honda.park()
  parking the Honda
< undefined
> mustang.sell()
  I want at least $45000 for the Mustang I paid 50000
```

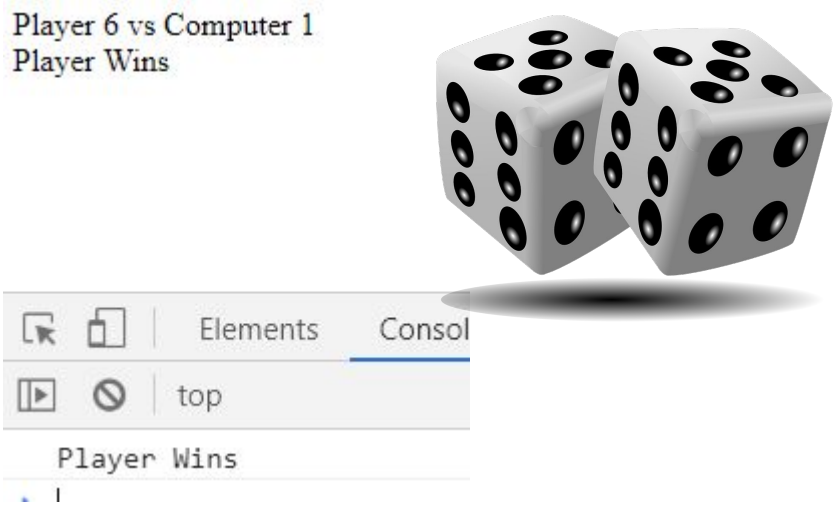
```
const honda = new Car("Red", "Honda", "Accord", 45000, 2020);
const mustang = new Car("Black", "Ford", "Mustang", 50000, 1965);

function Car(color, brand, make, price, year) {
    this.color = color;
    this.brand = brand;
    this.make = make;
    this.price = price;
    this.year = year;
    this.tires = 4;
    this.drive = function () {
        console.log("I'm driving " + this.brand + " " + this.make + ", vrooom vrooom");
    }
    this.park = function () {
        console.log("parking the " + this.brand);
    }
    this.sell = function () {
        console.log("I want at least $" + this.price * .9 + " for the " + this.make + " I paid " + this.price);
    }
}
```

Solution Car object

Challenge #2 Dice Game

1. Create an element on the page that can be clicked
2. Create a constructor function to contain the game functions calling it DiceGame
3. DiceGame Add option to roll the dice. Math random 1-6
4. DiceGame Add option to check winner
5. In the click event add the roll for player and computer using DiceGame
6. In the click event use DiceGame object to determine winner and get result string.
7. Output the result to the clickable element

*You can add styling as needed to make it look nice :)



```
const game = new DiceGame();
const dice = document.createElement('div');
dice.textContent = "Roll Here";
document.body.appendChild(dice);
dice.addEventListener('click', function () {
    let playerRoll = game.roll();
    let compRoll = game.roll();
    let winner = game.checker(playerRoll, compRoll);
    console.log(winner);
    dice.innerHTML = `Player ${playerRoll} vs Computer
${compRoll} <br> ${winner}`;
})
```

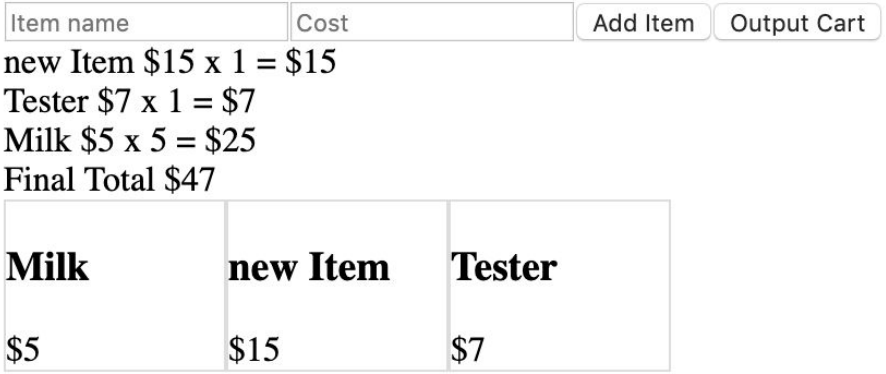
```
function DiceGame() {
    this.roll = function () {
        this.result = Math.floor(Math.random() * 6) + 1;
        return this.result;
    }
    this.checker = function (roll1, roll2) {
        if (roll1 > roll2) {
            return 'Player Wins';
        }
        else if (roll2 > roll1) {
            return 'Computer Wins';
        }
        else {
            return 'Tie';
        }
    }
}
```

Dice Game - #2

Challenge #3 Shopping Cart

- Create DOM elements for input and adding items to the store
- Add event listeners
- Create Objects for items
- Add shipping and tax to object
- Create Cart object
- Create adder method
- Create total cost method
- Create output of cart items
- Setup default item for testing

*Your application should be able to add items, click new items and add them to a cart.



```
const output = document.createElement('div');
document.body.appendChild(output);
const output1 = document.createElement('div');
document.body.appendChild(output1);
const itemInput1 = document.createElement('input');
itemInput1.setAttribute('type', 'text');
itemInput1.setAttribute('placeholder', 'Item name');
output.appendChild(itemInput1);
const itemInput2 = document.createElement('input');
itemInput2.setAttribute('type', 'number');
itemInput2.setAttribute('placeholder', 'Cost');
output.appendChild(itemInput2);
const itemButton = document.createElement('button');
itemButton.textContent = "Add Item";
itemButton.addEventListener('click', addItem);
output.appendChild(itemButton);
const outputButton = document.createElement('button');
outputButton.textContent = "Output Cart";
outputButton.addEventListener('click', function () {
    cart.output();
    console.log(cart);
});
output.appendChild(outputButton);
const items = [];
const cart = new Cart();
```

```
window.onload = function () {
    itemInput1.value = "Milk";
    itemInput2.value = 5;
    addItem();
}

function addItem() {
    let tempName = itemInput1.value || "Test";
    let tempCost = itemInput2.value || 10;
    let div = document.createElement('div');
    div.innerHTML = `<h3>${tempName}</h3>$${tempCost}`;
    div.style.border = "1px solid #ddd";
    div.style.display = "inline-block";
    div.style.width = "100px";
    document.body.appendChild(div);
    div.addEventListener('click', function () {
        cart.adder(tempName, tempCost);
        cart.output();
    });
    itemInput1.value = "";
    itemInput2.value = "";
}
```

Challenge #3 Shopping Cart

```
function Item(name, cost) {
    this.name = name;
    this.cost = cost;
    this.withTax = function () {
        return (this.cost * 1.15).toFixed(2);
    }
    this.shipping = function () {
        return (this.cost * 1.05).toFixed(2);
    }
}

function Cart() {
    const myList = {};
    this.totalCost = function () {
        let total = 0;
        for (let pro in myList) {
            let subTotal = myList[pro].subtotal();
            total += subTotal;
        }
        return total;
    }
```

```
this.output = function () {
        let total = 0;
        output1.innerHTML = "";
        for (let pro in myList) {
            let subTotal = myList[pro].subtotal();
            total += subTotal;
            output1.innerHTML += `${myList[pro].name}
$${myList[pro].price} x ${myList[pro].qty} = $${subTotal}<br>`
            console.log(pro)
        }
        output1.innerHTML += `Final Total $${total}`;
    }
    this.adder = function (item, cost) {
        let namer = item.toLowerCase();
        if (!myList[namer]) {
            myList[namer] = {
                name: item
                , price: cost
                , qty: 1
                , subtotal: function () {
                    return this.price * this.qty  }   }  }
        else {
            myList[namer].qty++;
        } } }
```

Challenge #3 Shopping Cart

Congratulations on completing the section

This ebook uses https://developer.mozilla.org/en-US/docs/Web/JavaScript as a source for examples. Check out more about JavaScript at MDN.

Find out more about my courses at http://www.discoveryvip.com/

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