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Javascript Arrays II

Multi-Dimensional Array

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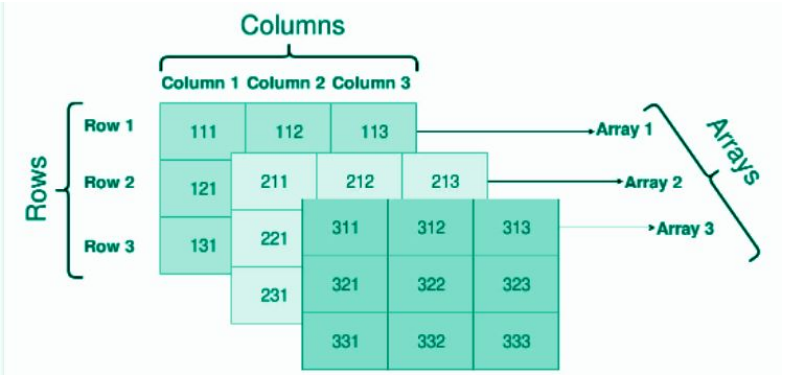
- Multidimensional Array is also known as **array of array**.
- JavaScript **does not** have inbuilt **support** for **multi-dimensional arrays**.
- So we need to **create an array inside an array** to make it work as Multidimensional Array.



Multi-Dimensional Array

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Create a multidimensional Array

```
1st, need to define some 1D array
var arr1 = ["ABC", 24, 18000];
var arr2 = ["EFG", 30, 30000];
var arr3 = ["IJK", 28, 41000];
var arr4 = ["EFG", 31, 28000];
var arr5 = ["EFG", 29, 35000];
// "salary" defines like a 1D array but it already contains some 1D array
var salary = [arr1, arr2, arr3, arr4, arr5];
```

OR

```
var salary = [
    ["ABC", 24, 18000],
    ["EFG", 30, 30000],
    ["IJK", 28, 41000],
    ["EFG", 31, 28000],
];
```

Multi-Dimensional Array

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Accessing Multidimensional Array elements

- Simple index-based notation

```
// This notation access the salary of "ABC" person which is 18000,
// [0] selects 1st row, and [2] selects the 3rd element
// of that 1st row which is 18000
salary[0][2];
```

- For many iterations

```
// This loop is for outer array
for (var i = 0, l1 = salary.length; i < l1; i++) {

    // This loop is for inner-arrays
    for (var j = 0, l2 = salary[i].length; j < l2; j++) {

        // Accessing each elements of inner-array
        documents.write( salary[i][j] );
    }
}
```

Adding elements in multidimensional array

There are two ways to add an element in multidimensional array

- Inner Array
- Outer Array

Adding elements to inner Array

- Square Bracket Notation

```
salary[3][3] = "India";

// It adds "India" at the 4th index of 4th sub-array,
// If we print the entire 4th sub-array, document.write(salary[3]);
// the output will be :  ["EFG", 31, 28000, "India"]
```

Multi-Dimensional Array

- push() Method

```
salary[3].push("India", "Mumbai");

// It add "India" at the 4th index and "Mumbai" at
// 5th index of 4th sub-array
// If we print the entire 4th sub-array,
// document.write(salary[3]);
// The output will be :  ["EFG", 31, 28000, "India", "Mumbai"]
```

Adding elements to outer Array

```
salary.push(["MNO", 29, 33300]);
// This row added after the last row in the "salary" array
```

Removing Elements in Multidimensional Array

- The **pop()** method is used to **remove elements** from the **inner array**.

```
// Remove last element from 4th sub-array
// That is 28000 indexing starts from 0
salary[3].pop();
```

- The **entire inner array** can be **removed** from the outer array with the **pop()** method.

```
// Removes last sub-array
// That is "["EFG", 31, 28000]"
salary.pop();
```

Referential Array

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Array as Objects

- Arrays is a **special** type of object.
- In Javascript, **typeOf** operator is used to return an **array object**.
- **Numbers** are used to access the **elements of an array**.

```
const person = ["John", "Doe", 46];
document.getElementById("demo").innerHTML = person[0];
```

- **Names** are used to access the **members of an object**.

```
const person = {firstName:"John", lastName:"Doe", age:46};
document.getElementById("demo").innerHTML = person.firstName;
```

Referential Array

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- An array can have different types of variables.

  I.e Array can have arrays

  Array can have functions

  Array can have objects

```
myArray[0] = Date.now;
myArray[1] = myFunction;
myArray[2] = myCars;
```

- In Javascript, **arrays with named** indexes are **not supported**.
- If we use **named indexes** in javascript, arrays will be **redefined as objects**.

Referential Array

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JavaScript Array Methods

- **concat()**

  Joins two or more arrays and returns a copy of the joined arrays.

- **copyWithin()**

  Copies array elements within the array, to and from specified positions.

- **entries()**

  Returns a **key/value pair** Array Iteration Object.

- **every()**

  Checks if **every element** in an array **pass a test**.

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JavaScript Array Methods

- **fill()**

  Fill the elements in an array with a **static value**.

- **filter()**

  Creates a new array with **every element** in an array that pass a test.

- **find()**

  Returns the value of the **first element** in an array that pass a test.

- **findIndex()**

  Returns the index of the **first element** in an array that pass a test.

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JavaScript Array Methods

- **forEach()**

  Calls a function for each array element.

- **from()**

  Creates an array from an object.

- **includes()**

  Check if an array **contains** the **specified element**.

- **indexOf()**

  Search the array for an element and returns its **position**.

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JavaScript Array Methods

- **map()**

  Creates a new array with the result of **calling a function** for each array element.

- **pop()**

  Removes the **last element** of an array, and returns that element.

- **push()**

  Adds new elements to the **end** of an array, and returns the **new length**.

- **reduce()**

  Reduce the values of an array to a **single value** (going **left-to-right**).

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JavaScript Array Methods

- **reduceRight()**

  Reduce the values of an array to a **single value** (going **right-to-left**).

- **reverse()**

  Reverses the order of the **elements** in an array.

- **shift()**

  Removes the first element of an array, and returns that element.

- **slice()**

  Selects a **part of an array**, and returns the **new array**.

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JavaScript Array Methods

- **some()**

  Checks if **any of the elements** in an array **pass a test**.

- **sort()**

  Sorts the elements of an **array**.

- **splice()**

  Adds/Removes elements from an array.

- **toString()**

  Converts an array to a string, and returns the result.

JavaScript Array Methods

- **unshift()**

  Adds new elements to the **beginning of an array**, and returns the **new length**.

- **valueOf()**

  Returns the **primitive value of an array**.

Referential Array

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JavaScript Array Properties

- **constructor**

  Returns the **function** that **created the Array object's prototype**.

- **length**

  Sets or returns the **number of elements** in an array.

- **prototype**

  Allows you to **add properties and methods** to an **Array object**.