



Lecture 4:

Arrays

What is an Array?

- Arrays are a special type of object to store multiple values in a single variable
- They are an **indexed collection** where each item has a numeric index, starting from 0.
- Can store any kind of data: numbers, strings, objects, or even other arrays.

Using Array Literal

This is the simplest and most common way to create an array

```
let numbers = [1, 2, 3];
```

Arrays can also be created using the **Array** constructor

```
let numbers2 = new Array(1, 2, 3);
```

Other ways to create an array

```
let arr = Array.of(7, 8);  
  
console.log(arr); // [7, 8]
```

```
let arr = Array.from('content')  
  
console.log(arr); // [ 'c', 'o', 'n', 't', 'e', 'n', 't' ]
```

```
let str = 'Alex, Pitter, Oliver, Mark';  
  
let arr = str.split(', ');  
// [ 'Alex', 'Pitter', 'Oliver', 'Mark' ]
```

Checking the type of array

- The **typeof** operator returns “**object**” because arrays are technically a type of object in JavaScript.
- The **Array.isArray()** method is a built-in JavaScript method specifically designed to check if a value is an array

```
typeof [1, 2, 3];
```

```
const arr = [1, 2, 3];  
  
Array.isArray(arr);
```

Accessing and Modifying Arrays

Checking the Length of an Array

```
const arr = [1, 2, 3];  
  
arr.length // 3
```

Accessing Array Elements

```
const arr = [1, 2, 3];  
  
let first = arr[0];
```

Accessing and Modifying Arrays

Modifying Array Elements

```
let arr = [1, 2, 3];  
  
arr[0] = 4 // arr = [4, 2, 3];
```

Mutable Methods

- **push()** – Add element to the end
- **pop()** – Remove the last element
- **shift()** – Remove the first element
- **unshift()** – Add elements to the beginning
- **splice()** – Add or remove elements
- **sort()** – Sort elements
- **reverse()** – Reverse the array
- **fill()** – Fill elements in an array

Immutable Methods

- **concat()** – Merge arrays
- **join()** – Combine elements into a string
- **slice()** – Extract part of an array
- **flat()** – Flatten a nested array
- **flatMap()** – Map and flatten the array

Methods for Searching

- **find()** – Find the first matching element
- **findIndex()** – Find the index of the first matching element
- **indexOf()** – Find the index of a value
- **lastIndexOf()** – Find the last occurrence of a value

Methods for Iterating

- **forEach()** – Iterating Over Elements
- **filter()** – Filter array based on condition
- **map()** – Transform Elements
- **reduce()** – Reduce array to a single value
- **reduceRight()** – Reduce array from right to left
- **every()** – Check if all elements pass a test
- **some()** – Check if any element passes a test

