WSA | Forward looking IT finishing school

Array

JavaScript

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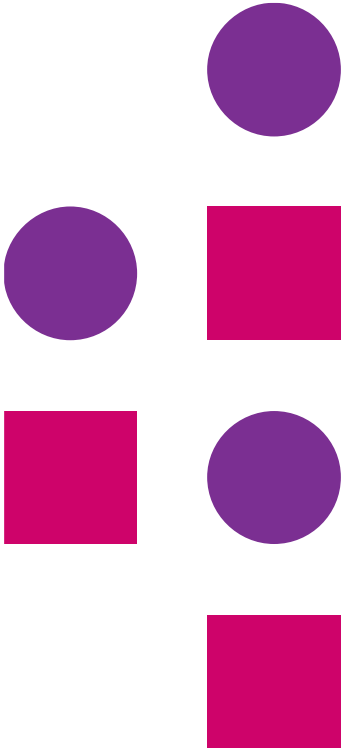
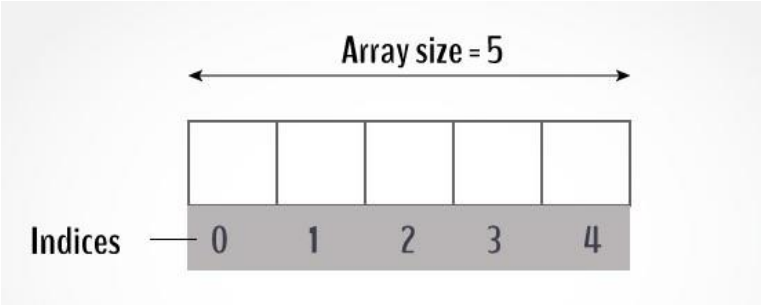


Arrays

(Introduction to Arrays)

What is an Array?

- Array is a collection of similar or different data types
- Each data in array is called an element
- Each elements has a numeric position, known as its index / indices, in the array
- The index numbers start from zero
- In JavaScript, Array is also an object. The `typeof` operator will return the same
- Array object has `length` property which returns the total number of elements



Array
(Syntax – Using [ ])

```
Syntax :
// Creates initialized array
var array-name = [item1, item2, …];

// Creates empty
var array-name = [ ];
```

Array
(Syntax – Using constructor)

```
Syntax :
var array-name = new Array(item1, item2, item3);
Or
var array-name = Array(item1, item2, item3);
Or
var array-name = Array(array-length);
```

Array - Example

```
Example :
var array = [10, 20, 30, 40, 50];
Or
var array = new Array(10, 20, 30, 40, 50);
Or
var array = Array(3);
```

Array Access – Using loop

```
for ( let idx = 0; idx < 5; idx++ ) {
    document.write("Element at index " + idx + " is " + myArray[idx]);
}
```

```
for ( let idx in myArray ) {
    document.write("Element at index " + idx + " is " + myArray[idx]);
}
```

Array - Heterogeneous

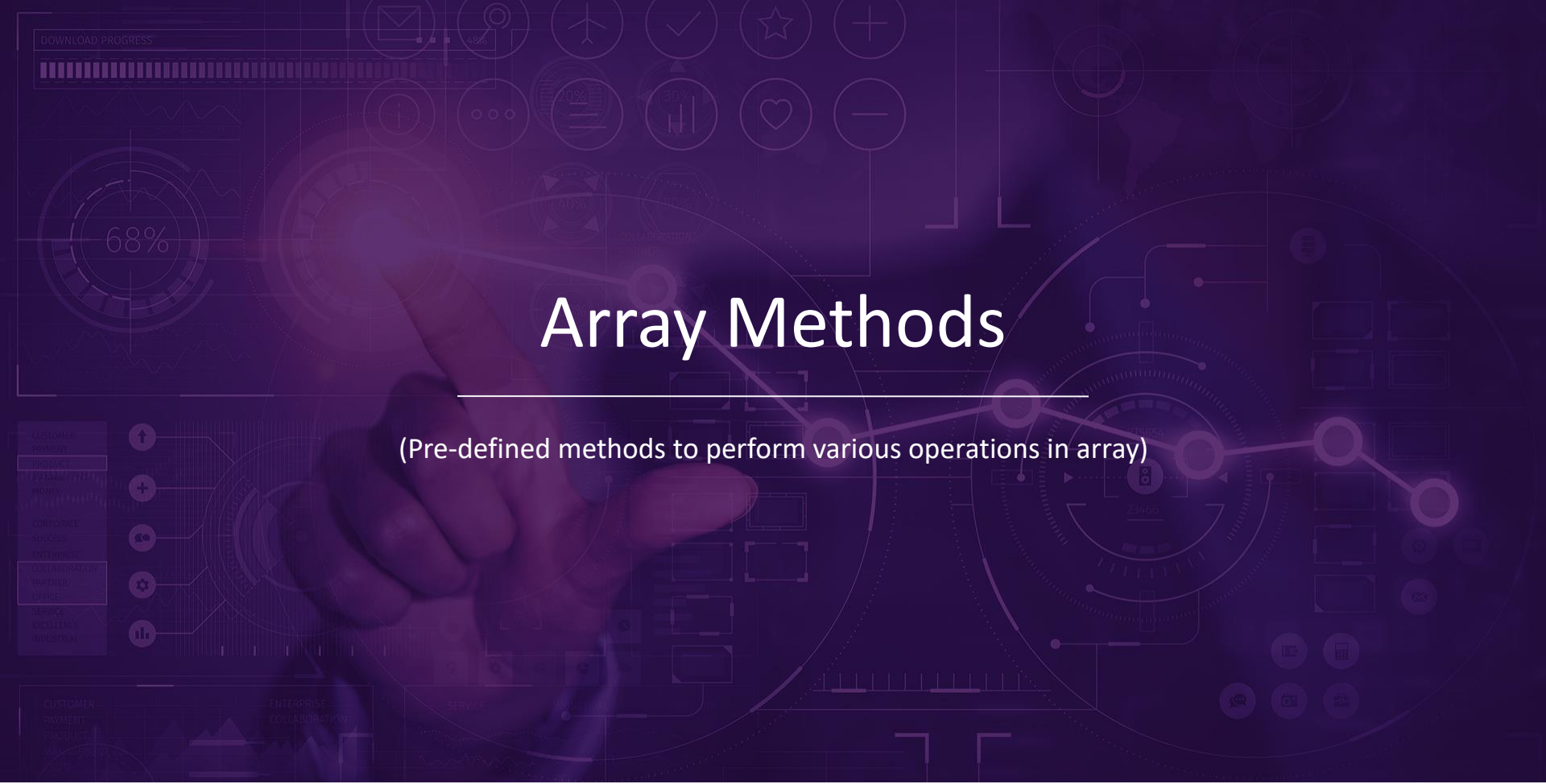
Each element in an array can be of different types

```
var mixArray = [“Student”, 95, true];

for(let idx = 0; idx < 3; idx++) {
    console.log (mixArray[idx]);
}
```

Exercise

- WAP to create an array with 10 integers and find out the following:
  - Sum of all number
  - Average
  - Maximum value & Minimum value
- WAP to reverse an array elements
- WAP to represent two sets of integers. Find out union and intersection of those two sets (Ref – Set theory)
  - Assume there are no duplicates in the array
  - Hint – Write a findElement() function to check if an element is present in an array or not



Array Methods

(Pre-defined methods to perform various operations in array)

Array Methods

Method	Description
`join()`	Concatenates all the elements of array into string
`pop()`	Deletes last element of an array
`push()`	Appends new element in the last of array
`sort()`	Sorts an array in alphabetical order
`reverse()`	Reverses array elements order in the array

Array Methods

Method	Description
`shift()`	Removes first element from the array and shifts all other element to a lower index
`unshift()`	Unshift method adds elements to the beginning of an array and return new length of array
`concat()`	The concat method also adds elements to an array. Unlike the push method, it does not modify the existing array, but instead returns a new array
`slice()`	The array slice method returns part of an array
`splice()`	The array splice method can be used for adding and/or removing elements from an array

The join() Method

- The join() method converts all the elements of an array to strings and concatenates them, returning the resulting string
- It behaves like toString(), but we can specify separator

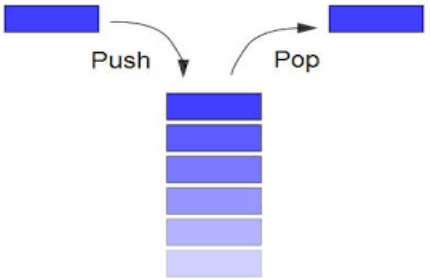
```
Example :
var fruits = ["Banana", "Orange","Apple", "Mango"];
var str = fruits.join(" + ");
document.write(str);
```

The push() and pop() methods

Stack operations – LIFO

```
var numStack = [10, 20, 30, 40, 50];
numStack.pop();  // Pop an element
for (let idx=0; idx <numStack.length; idx++) {
    document.write(numStack[idx] + "<br>");
}

numStack.push(100); // Push an element
for (let idx=0; idx <numStack.length; idx++) {
    document.write(numStack[idx] + "<br>");
}
```



The sort() Method

The sort() method sorts an array in alphabetic order

```
var numList = [55, 3, 16, 21];
numList.sort();
for (let idx = 0; idx < numList.length; idx++){
    document.write(numList[idx] + "<br>");
}
```

The reverse() Method

The reverse() method reverses the elements in an array

```
var numList = [55, 3, 16, 21];
numList.reverse();
for(let idx = 0; idx < numList.length; idx++){
    document.write(numList[idx] + "<br>");
}
```

Exercise

- WAP to represent two sets of integers. Find out union and intersection of those two sets (Ref – Set theory)
  - Assume there ARE duplicates in the array
  - Hint – Write a findElement() function to check if an element is present in an array or not
- WAP to find Nth largest element in a given array
- WAP to perform shift operations of a given element
  - Shift Nth element by right by M positions
  - Shift Nth element by left by M positions

Multidimensional Array

The matrix

Multidimensional Array

Declaring Multidimensional Array

```
var array2d = [ [10, 20, 30], [40, 50, 60], [70, 80, 90] ];
for(let idx = 0; idx < array2d.length; idx++) {
  for(let jdx = 0; jdx < array2d[idx].length; jdx++) {
    document.write(array2d[idx][jdx] + " ");
  }
  document.write("<br>");
}
```

Exercise

- WAP to find out sum of diagonal elements in a 2D array
- WAP to find max and min value in a given row
- WAP to multiply two matrix using 2D arrays

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