WEP - Loops & Arrays

Repeating code & multiple Values in a variable

Agenda

- Loops
- Arrays
- Questions

Learn Objectives

- You understand what a loop is
- You know loop types
- You know what is loop traversing
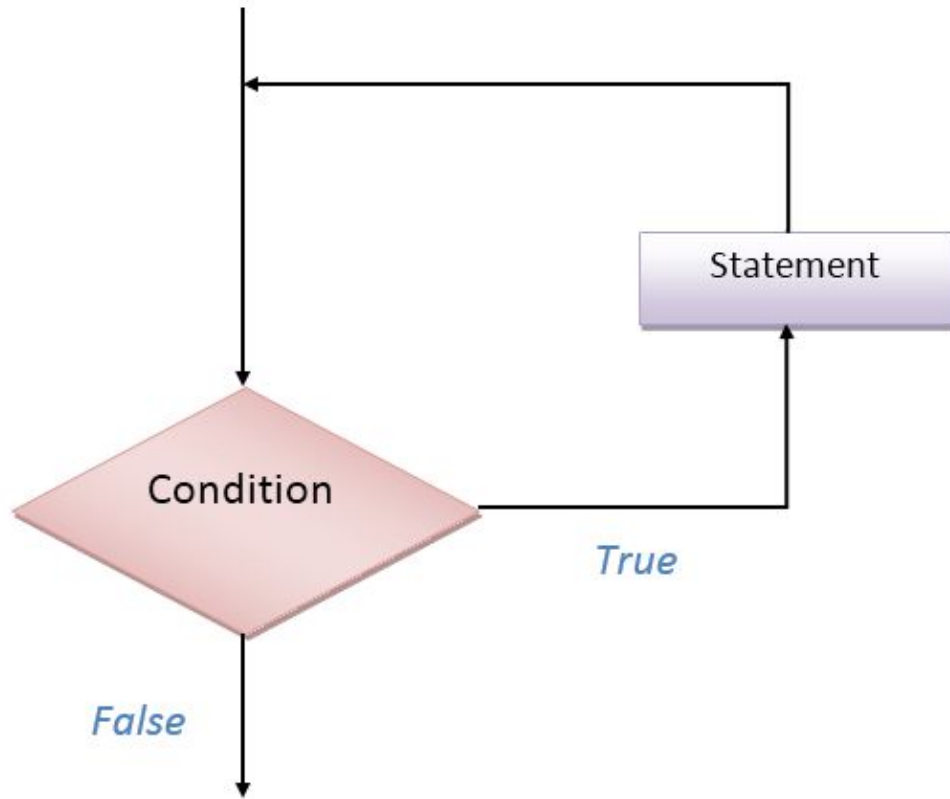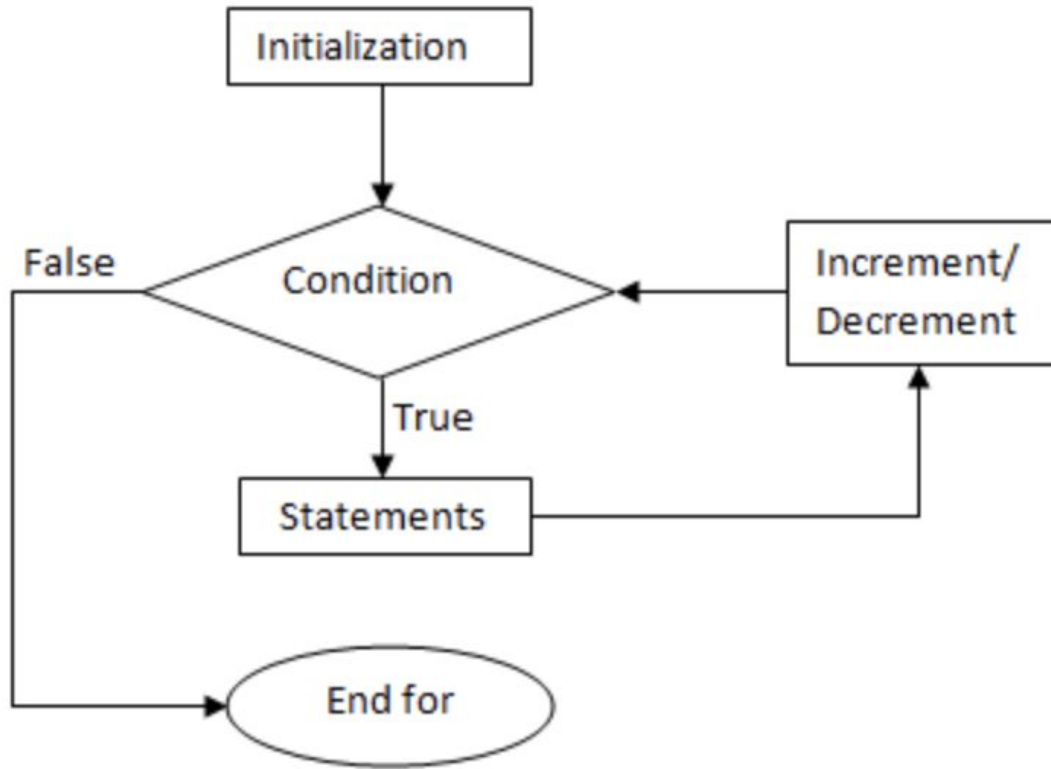- You know what arrays are

Language Constructs

Loops

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- It's a way to run a code part multiple times
- Code Reusing
- A code Block (scope)

Types of loops
- for()
- while, do while
- for-in
- for-of
- break, continue

A loop

A loop with an incrementing index

initialization is a separate statement

loop-continuation condition

let `power = 1;`

`while (` `power <= n/2` `)`

braces are optional when body is a single statement

`{`

`power = 2*power;`

`}`

body

While loop

```
let i = 3;

while (i) {

  alert( i );

  i--;

}
/*****************************/

let i = 0;

do {

  alert( i );

  i++;

} while (i < 3);
```
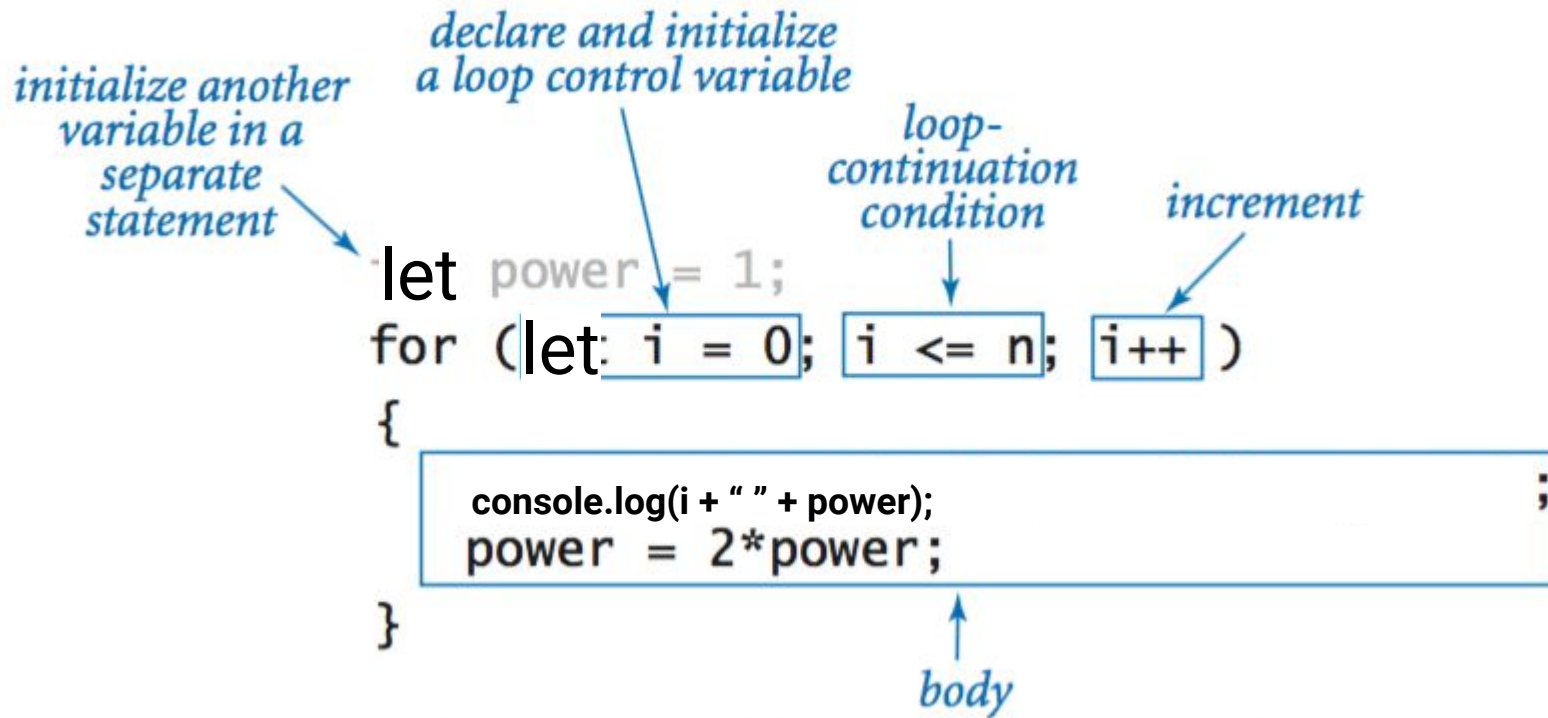
while , do while

initialize another
variable in a
separate
statement

declare and initialize
a loop control variable

loop-
continuation
condition

increment

```
let power = 1;
for (let i = 0; i <= n; i++ )
{
    console.log(i + " " + power);
    power = 2*power;
}
```

body

Foor loop

```
let myStringArray = ["Hello","World"];

let arrayLength = myStringArray.length;

for (let i = 0; i < arrayLength; i++) {

        console.log(myStringArray[i]);

}
```

Looping with classical "for loop"

```javascript
let fruitList = ["elma","armut", "cilek", "domates"];


for (let aFruit of fruitList) {

        console.log(aFruit);

}
```

Loops with new "for-of-loop

```
let days = ["Pazartesi", "Sali", "Carsamba", "Persembe", "Cuma",
"Cumartesi", "Pazar"];



days.forEach(function(aDay){

      console.log(aDay);

});



// Mit Arrow Functions

days.forEach(aDay => console.log(aDay));
```

Looping with the method "forEach" from the array

Language Constructs

Arrays

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- An array is an address in memory
- It shows a series of data bound together.
- Individual elements in an array can be accessed directly.
- With the help of arrays we can keep many data together with one variable.
- Arrays can automatically increase in size
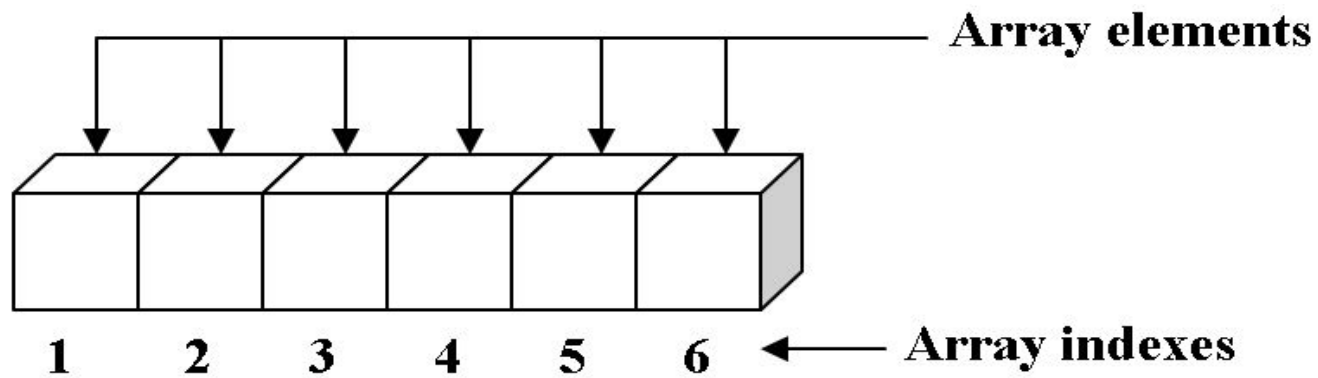
array

/əˈreɪ/ 🔊

noun

1. an impressive display or range of a particular type of thing.
   "there is a vast array of literature on the topic"

2. an ordered series or arrangement.
   "several arrays of solar panels will help provide power"
   synonyms: arrangement, assembling, assemblage, line-up, formation, ordering, disposition, marshalling, muster, amassing; More
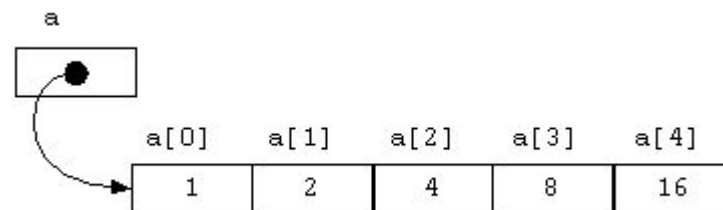
verb

1. display or arrange (things) in a particular way.
   "the manifesto immediately divided the forces arrayed against him"
   synonyms: arrange, assemble, draw up, group, order, range, place, position, set out, set forth, dispose, marshal, muster; More

2. dress someone in (the clothes specified).
   "they were arrayed in Hungarian national dress"
   synonyms: dress, attire, clothe, robe, garb, deck, deck out, drape, accoutre, outfit, fit out, costume, get up, turn out, trick out/up; More
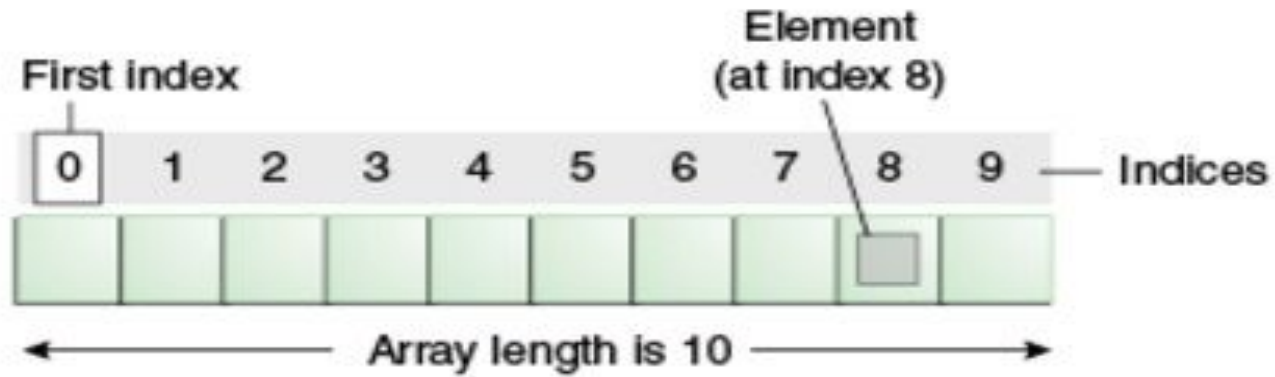
Array CiTY

Array elements

Array indexes

One-dimensional array with six elements

```
        a
      ┌─────┐
      │  ●  │
      └──┬──┘
         │
         │   a[0]   a[1]   a[2]   a[3]   a[4]
         │  ┌─────┬─────┬─────┬─────┬─────┐
         └─▶│  1  │  2  │  4  │  8  │ 16  │
            └─────┴─────┴─────┴─────┴─────┘
```

Concept of an Array

First index

Element
(at index 8)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | — Indices |

Array length is 10

An array of 10 elements.

Concept of Array

WHY ARRAY?

Problem?

- Implement an application that will calculate 100 students exam average.
- Variables needed?

  int studentA;
  int studentB;
  int studentC;
  int studentD;
  ...

Why to use an array?

Ever used an array before?!

Here comes the data train.
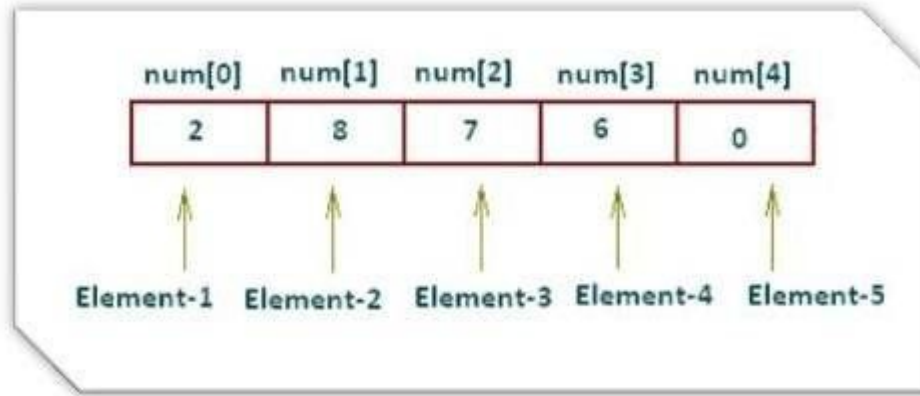
Each car holds a single piece of data.
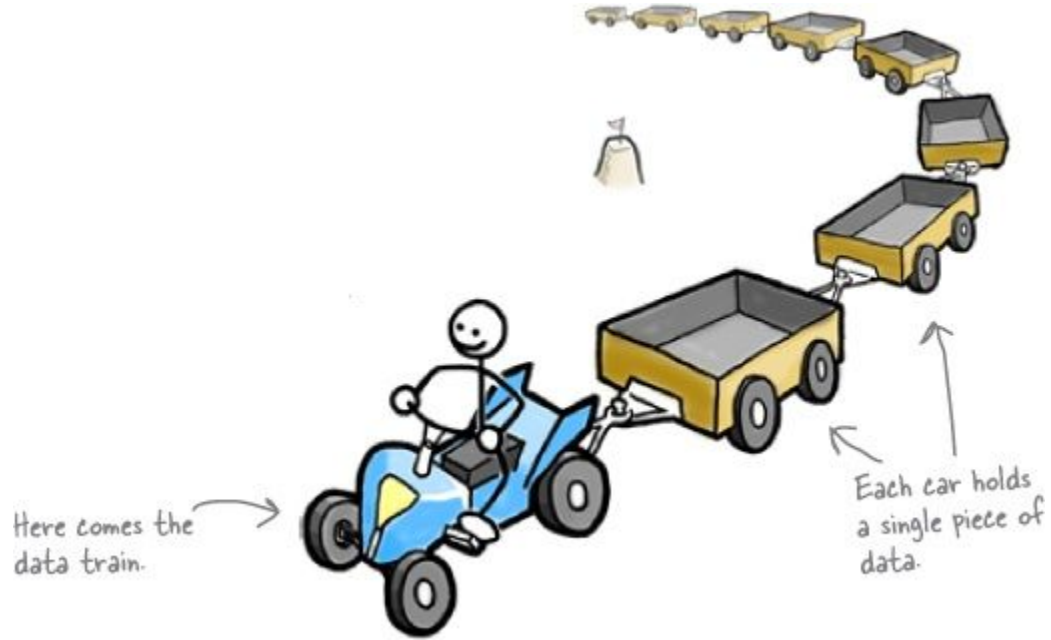
Array is empty!
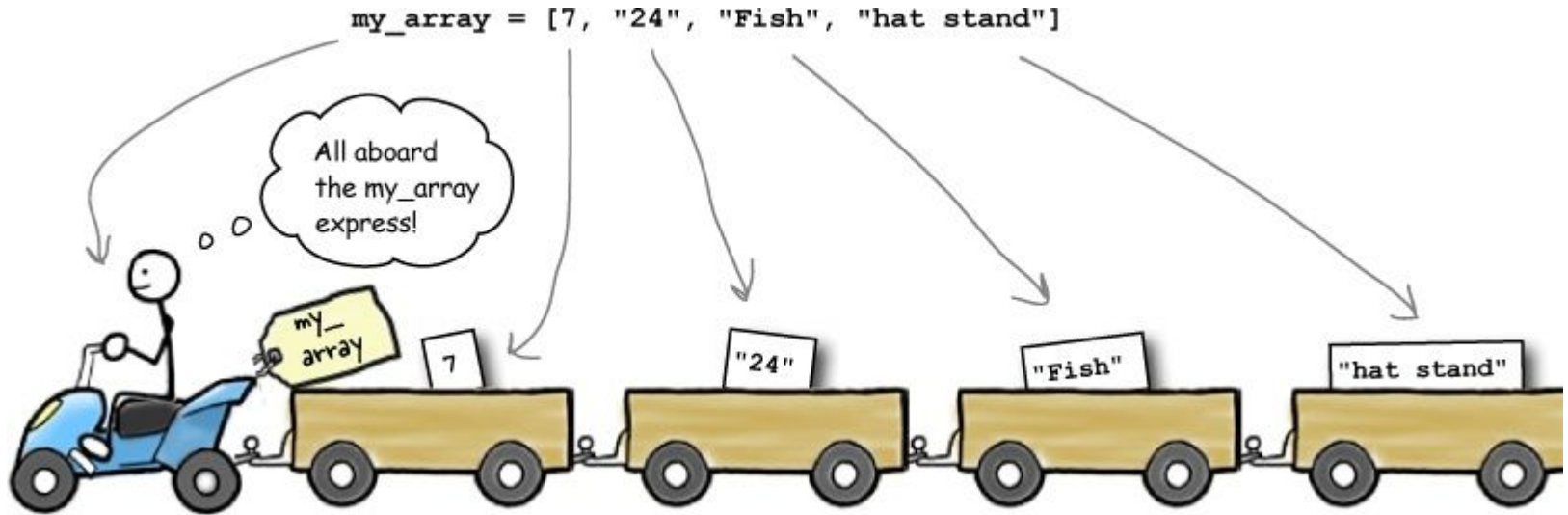
Array is filled out!
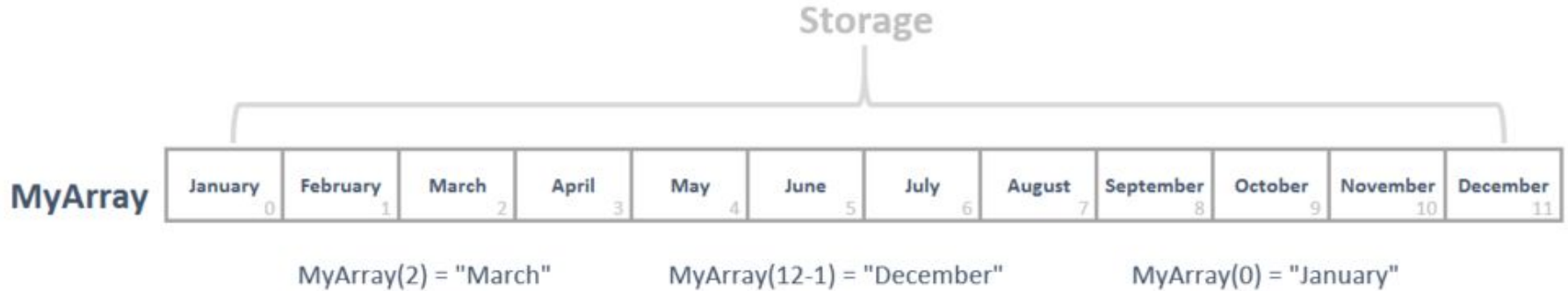
How can I keep month names in an array?
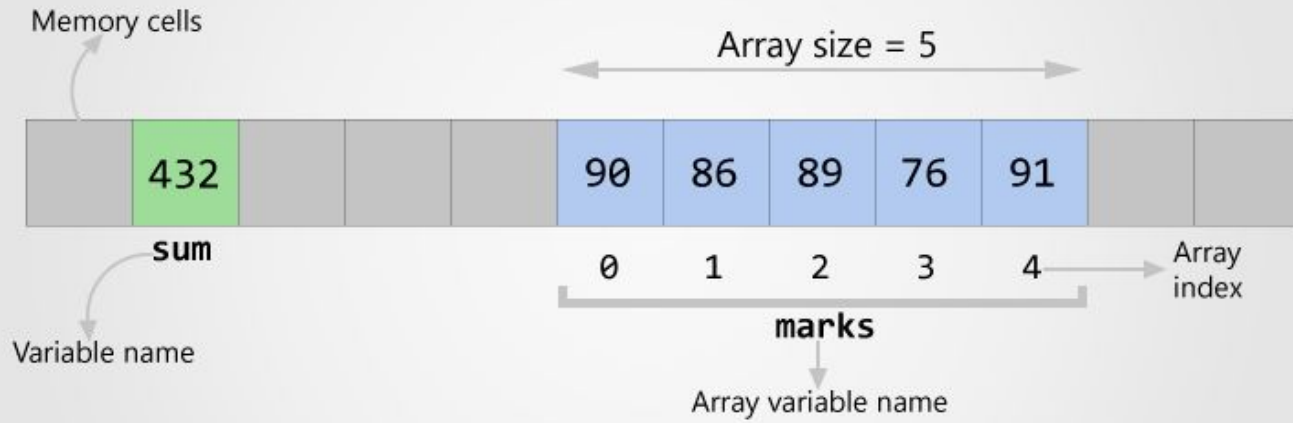
How does the memory look like?

How to access single elements in an array?
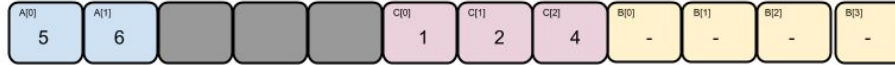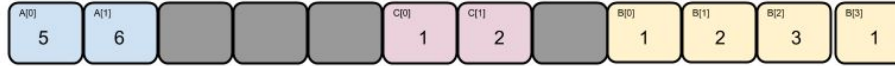
What happens in memory when operations are performed on an array?

source: https://gamealchemist.wordpress.com/2013/05/01/lets-get-those-javascript-arrays-to-work-fast/

Array Creation

literal

```
let leeresArray = [ ];

let myNotes= [4, 4, 2, 5, 6, 6];

let friends = ["Rabia", "Ilyas",
"Nurullah", "Cemil", "Hamide",
"Taner"];
```

let's try it!

Create an Array with daynames

Array Creation

With Array Constructor

```javascript
// empty Garage

let myEmptyGarage = new Array( );

// Garage with cars

let myGarage = new Array("X5", "Ferrari", "VW Golf");



// Special Case

let garageWithEmptySlots = new Array( 5);
```
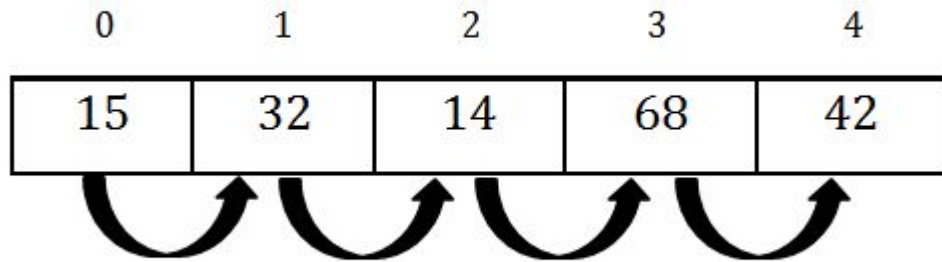
let's try it!

Create an Array with month names

let's try it!

Create an array of 9 numbers, display the first, last and middle number in the console.

Traversing/Navigation in Arrays

Type of Traversing

- Classic "for" Loop
- "for-of" Loop
- ".forEach()" method from the array itself
- ...

```javascript
let myStringArray = ["Hello","World"];

let arrayLength = myStringArray.length;

for (let i = 0; i < arrayLength; i++) {

    console.log(myStringArray[i]);

}
```

Looping mit klassischem "for loop"

let's try it!

Erstelle ein Array mit Kindernamen, zeige Sie im Console an.

```
let fruitList = ["elma","armut", "cilek", "domates"];


for (let aFruit of fruitList) {

    console.log(aFruit);

}
```

Looping mit neuem "for-of loop"

let's try it!

Erstelle ein Array mit Ländernamen und zeige Sie im Console an.

```javascript
let days = ["Pazartesi", "Sali", "Carsamba", "Persembe", "Cuma",
"Cumartesi", "Pazar"];



days.forEach(function(aDay){

      console.log(aDay);

});



// Mit Arrow Functions

days.forEach(aDay => console.log(aDay));
```

Looping mit der Methode "forEach" vom Array

let's try it!

Erstelle ein Array mit Monatsnamen und zeige sie mit der Reihenfolge im Console an.

Questions?