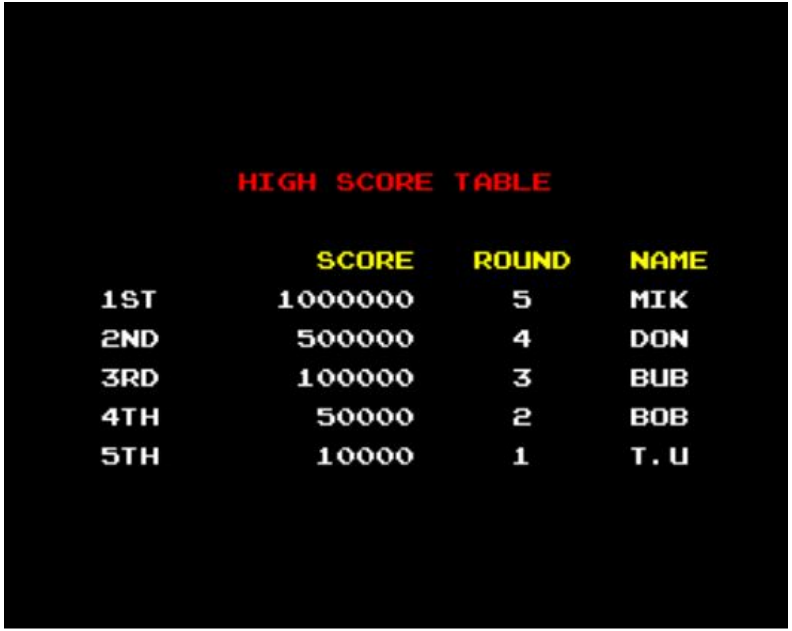
Intro to Arrays with JS

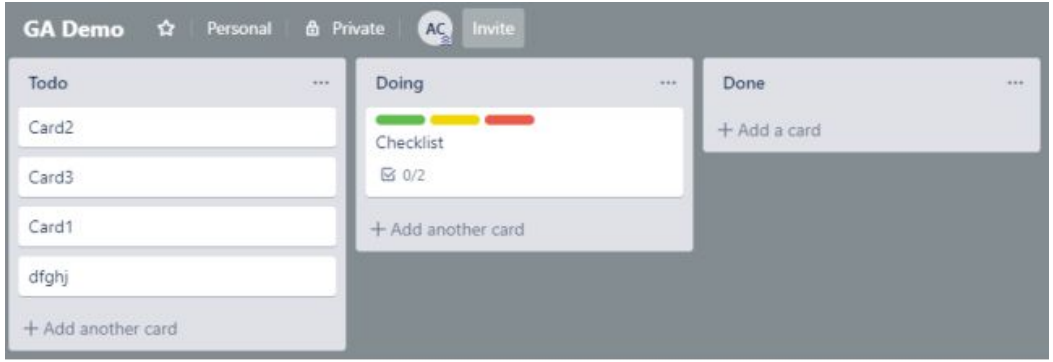
What are arrays

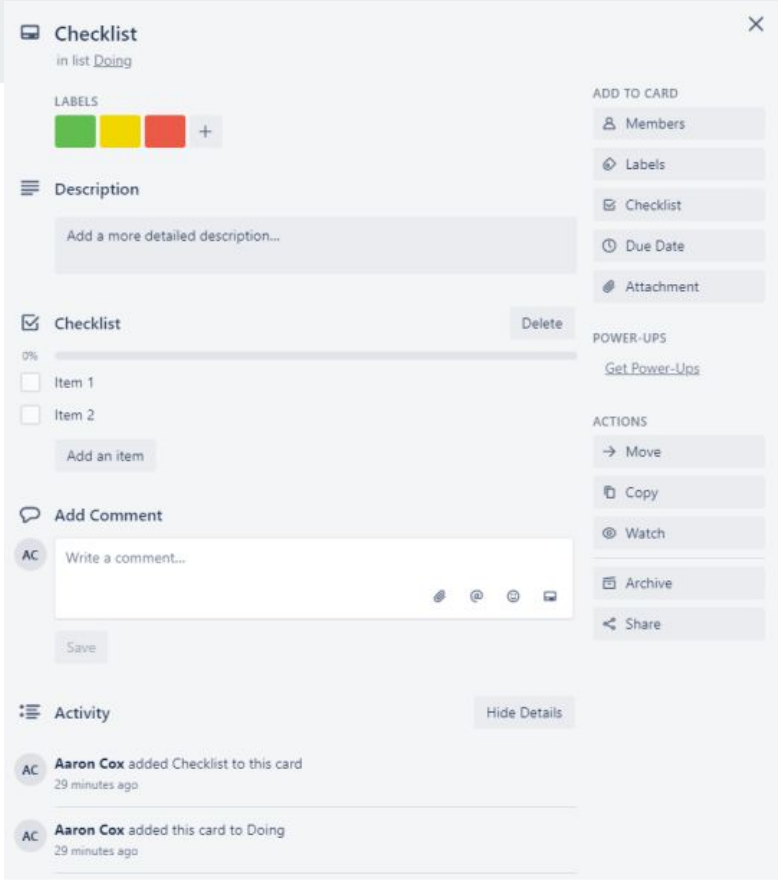
An array allow us to store a collection of values, rather than a single value.

- When might we need an array?
- High Score Table
- Todo List
- Pixels in an image
- Contact list in Facebook Messenger



Trello


GA Demo
Personal
Private
AC
Invite
Todo
Card2
Card3
Card1
dfghj
+ Add another card
Doing
Checklist
0/2
+ Add another card
Done
+ Add a card


Checklist
in list Doing
LABELS
Description
Add a more detailed description...
Checklist
Delete
0%
Item 1
Item 2
Add an item
Add Comment
AC
Write a comment...
Save
Activity
Hide Details
AC
Aaron Cox added Checklist to this card
29 minutes ago
AC
Aaron Cox added this card to Doing
29 minutes ago
ADD TO CARD
Members
Labels
Checklist
Due Date
Attachment
POWER-UPS
Get Power-Ups
ACTIONS
Move
Copy
Watch
Archive
Share

What arrays allow us to do

Add, and remove values

Search for a value

Filter out values based on conditions

Sort the collection

Defining an Array

An array allow us to store a collection of values, rather than a single value.

An array can be empty or can store 1 or more items

Each item can be of any type

Each item has a location

```
// Defining an empty array
let numbers = [];
// or
let numbers = new Array();

// Initialise an array pre-populated with numbers
let numbers = [12, 38, 41, 17];
// or
let numbers = new Array(12, 38, 41, 17);
// we can also store strings, or any other data type
let names = ['aaron', 'fede', 'yianni'];

// arrays can store any type of value,
// they dont need to be the same
let things = [false, 12, 'dont-do-this'];
```

Index

Each item in an array has a location.

```
let names = ['bob', 'ted', 'sam', 'fred', 'alice', 'aaron', 'fede', 'yianni'];
//           0     1      2      3        4        5       6       7
```

The index always starts at 0, and increments in order.
We can access an individual value in the array via the index value

```
console.log(names[3]);
console.log(names[10]); // undefined
```

Iterating through an array

There are 2 ways we can loop through an array

- Useing a for loop.
- Useing the foreach method

For loop vs forEach
https://davidtang.io/2016/07/30/javascript-for-loop-vs-array-foreach.html

```
// useing a for loop
for(let i=0; i<names.length; i++) {
   console.log(names[i]);
}

// useing the foreach method
names.forEach(function(value){
   console.log(names[i]);
});
```

Adding values to an array

Add to the end of an array

Add to the beginning of the array

Insert at a location within the array

```
// define an empty array
let names = [];

// add 'aaron' to the end of the array
names.push('aaron');

// add yianni to the beginning of the array
names.unshift("yianni");

// add fede to the middle of the array
// at index position 1, remove 0 elements, then add
// "fede" to that position
names.splice( 1, 0, "fede");

// final result
// ['yianni', 'fede', 'aaron']
```

Removing items from array

Removing items from arrays (more examples)
https://love2dev.com/blog/javascript-remove-from-array/

```
let names = ['yianni', 'fede', 'aaron'];

// at index 1, remove 1 item, don’t insert anything
names.splice(1, 1);

// remove last item
names.pop();

// remove first item
names.shift();
```

Splice

The **splice()** method changes the contents of an array by removing or replacing existing elements and/or adding new elements

https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Array/splice

Searching methods

```
let names = ['yianni', 'fede', 'aaron'];
names.includes( 'aaron' ); // Returns true.
names.includes( 'bob' ); // Returns false.

names.indexOf('aaron'); // returns 2
names.indexOf('bob'); // returns -1
```

Lets implement our own methods

- Includes(arr, value)
  Return true/false if a value exists
- IndexOf(arr, value)
  Return index of value if found
- CountValue(arr, value)
  Return number of times value was found
- ForEach(arr, fn)
  Calls fn for each item in the array
- Filter(arr, fn)
  Call fn for each item in the array, return a new array of values where the fn returned true.

Exercises - Difficult

- Write a function to remove duplicate items from an array
- Write a program to shuffle a sorted array

More methods and examples

https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Array