

Sorting in JavaScript

Under the hood



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What is this all about?

Once I went down a rabbit hole myself trying to really understand this meme

```
1 // How do they sort emojis ?  
2 const meme = [ "🥚", "🐓", "🐤", "🐣" ];  
3  
4 meme.sort()  
5 // [ '🐓', '🐣', '🐤', '🥚' ]
```

Why ? How ?

And hence this explanation on how sort actually works



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Deeper stuff ahead



Some basics . . .

The sort() method in JavaScript is primarily used for sorting elements in an array.

Two ways to use it

Without a compare function

```
1 // Functionless
2 sort()
4
5 // Compare Function
6
7 sort(compareFn)
```

With a compare function



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1. Functionless Sort

Let's look at a simple functionless sort and see how it works

```
1 // Your sample array
2 const numbers = [5, 2, 1, 9, 11];
3
4 numbers.sort()
5
6 console.log(numbers)
7 // [1, 11, 2, 5, 9];
```

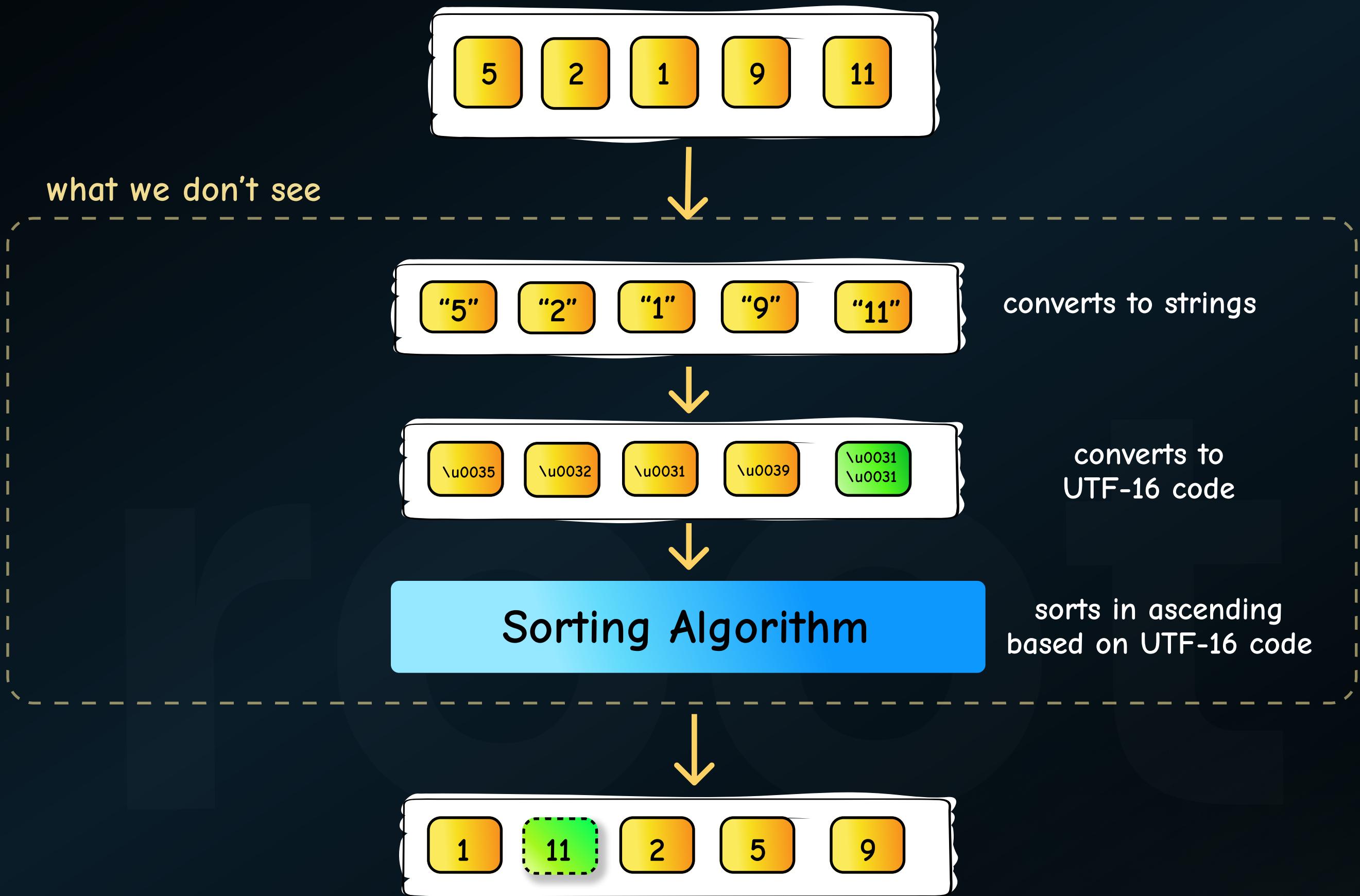
Visualizing it, this is what happens



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A highlevel sort() flow . . .



The sorting happens “in-place” i.e it modifies the original array



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2. With a Compare Function

Our compare
function

```
1 // Your sample array
2 const numbers = [5, 2, 1, 9, 11];
3
4 numbers.sort(function(a, b){
5     if (a > b) {
6         return 1;
7     }
8     else if (a < b) {
9         return -1;
10    }
11    else {
12        return 0;
13    }
14 });
15
16 console.log(numbers);
17 // [1, 2, 5, 9, 11];
```

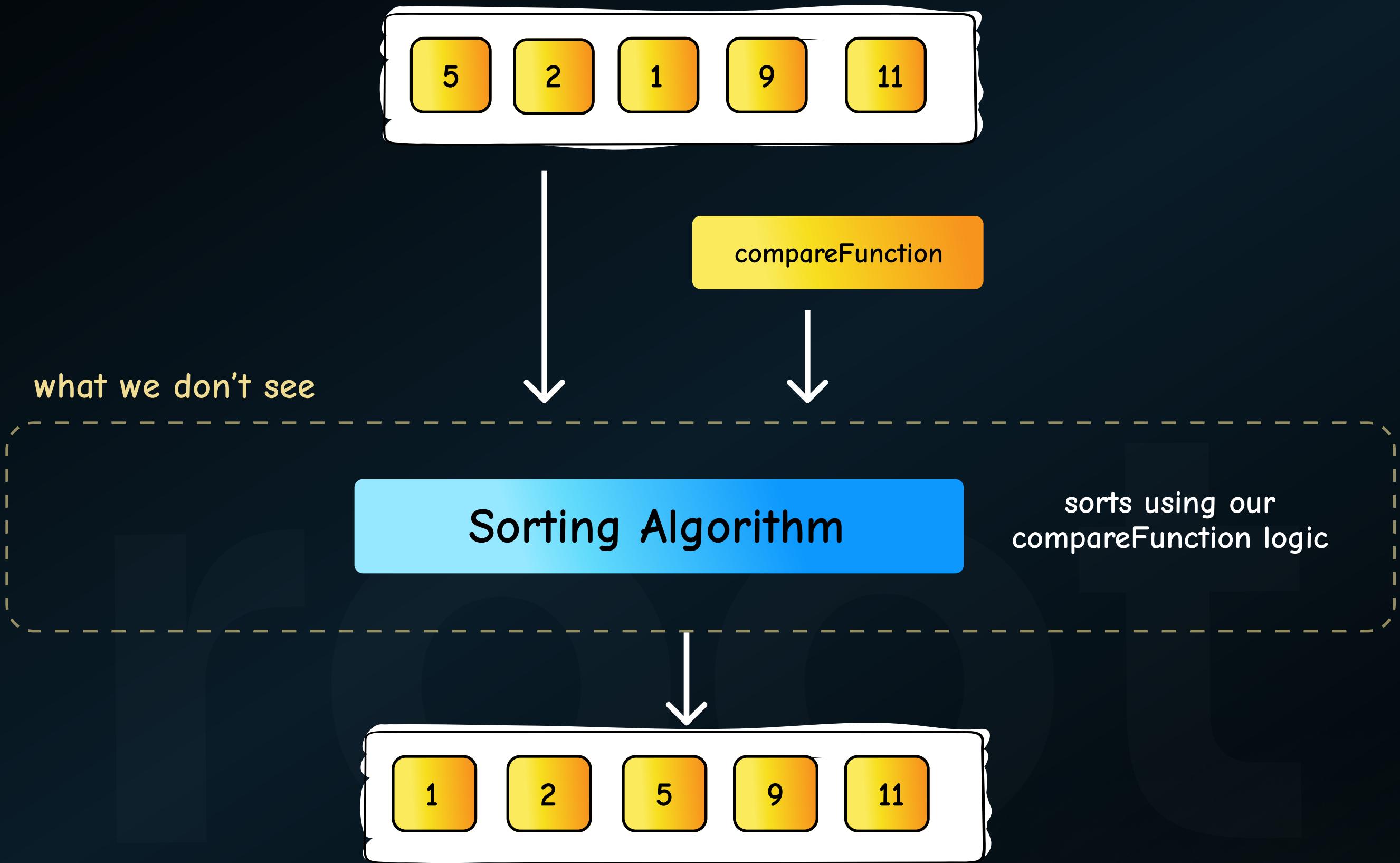
There are shorter alternatives to this, but they mainly work only with numbers



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visualizing that flow . . .



The sorting happens “in-place” i.e it modifies the original array

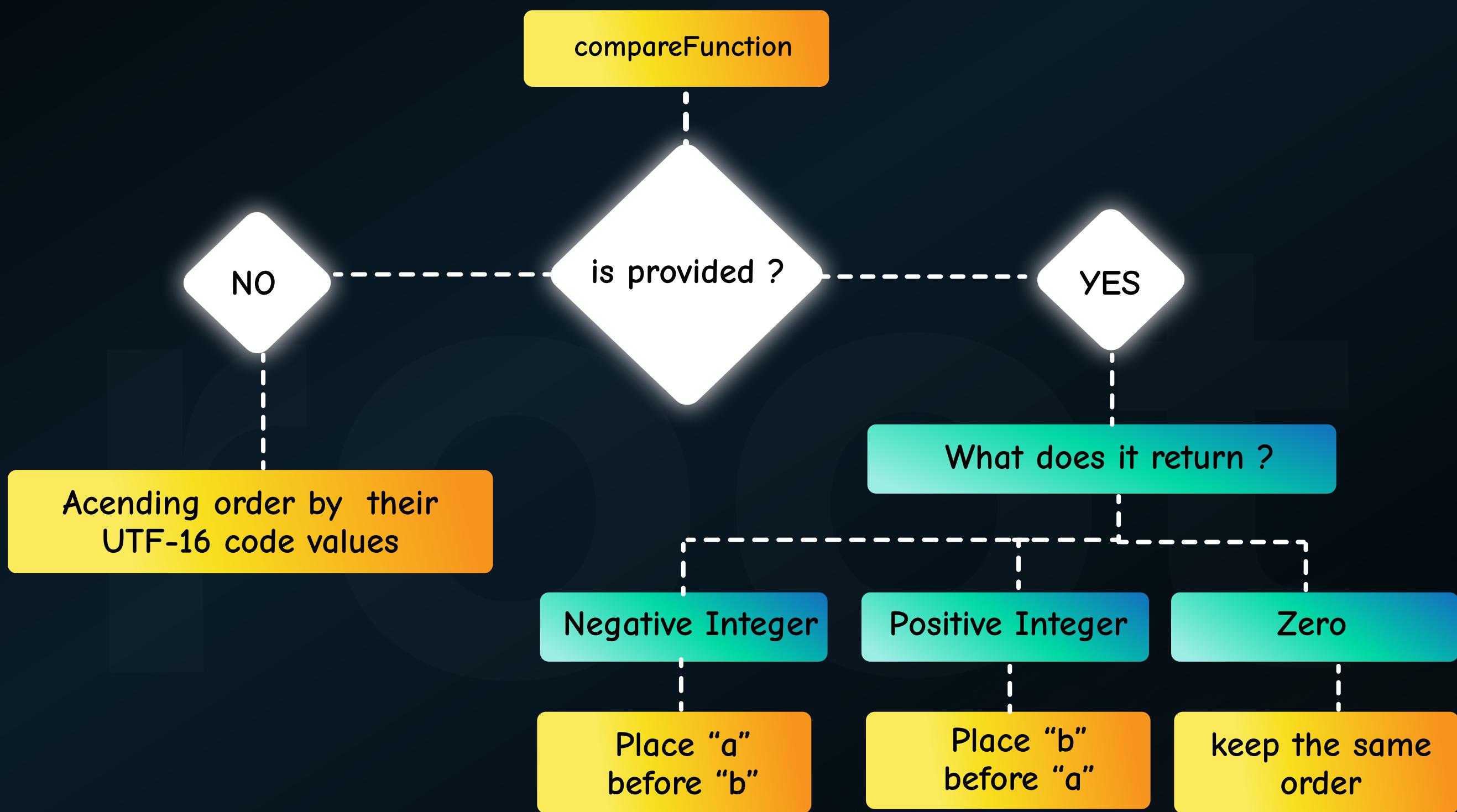


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What about the compare function?

Now the pure purpose of the compare function is just to let the algorithm know how to sort them (Ascending or Descending)



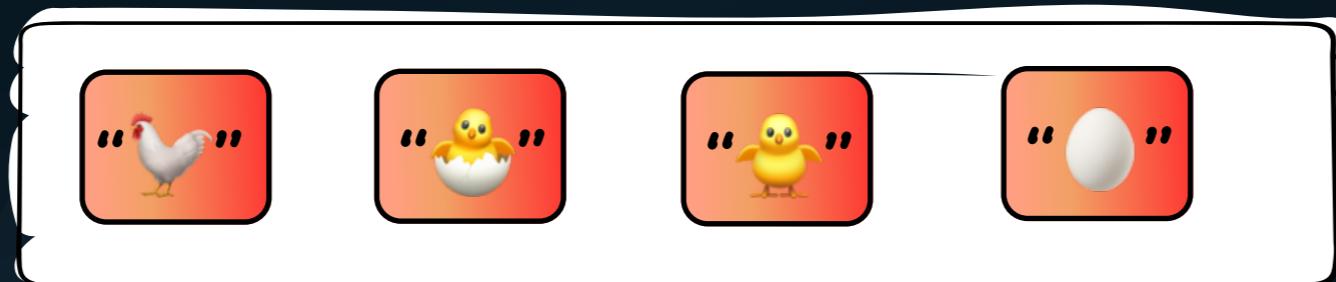
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So now we understand the emojis

They're just sorted in ascending based on the UTF-16 values

```
1 // How do they sort emojis ?  
2 const meme = ["🥚", "🐓", "🐤", "🐣"];  
3  
4 meme.sort()  
5 // [ '🐓', '🐣', '🐤', '🥚' ]
```



"\uD83D \uDC13"

"\uD83D \uDC23"

"\uD83D \uDC25"

"\uD83E \uDD5A"

But still, how is that sorting actually happening ?

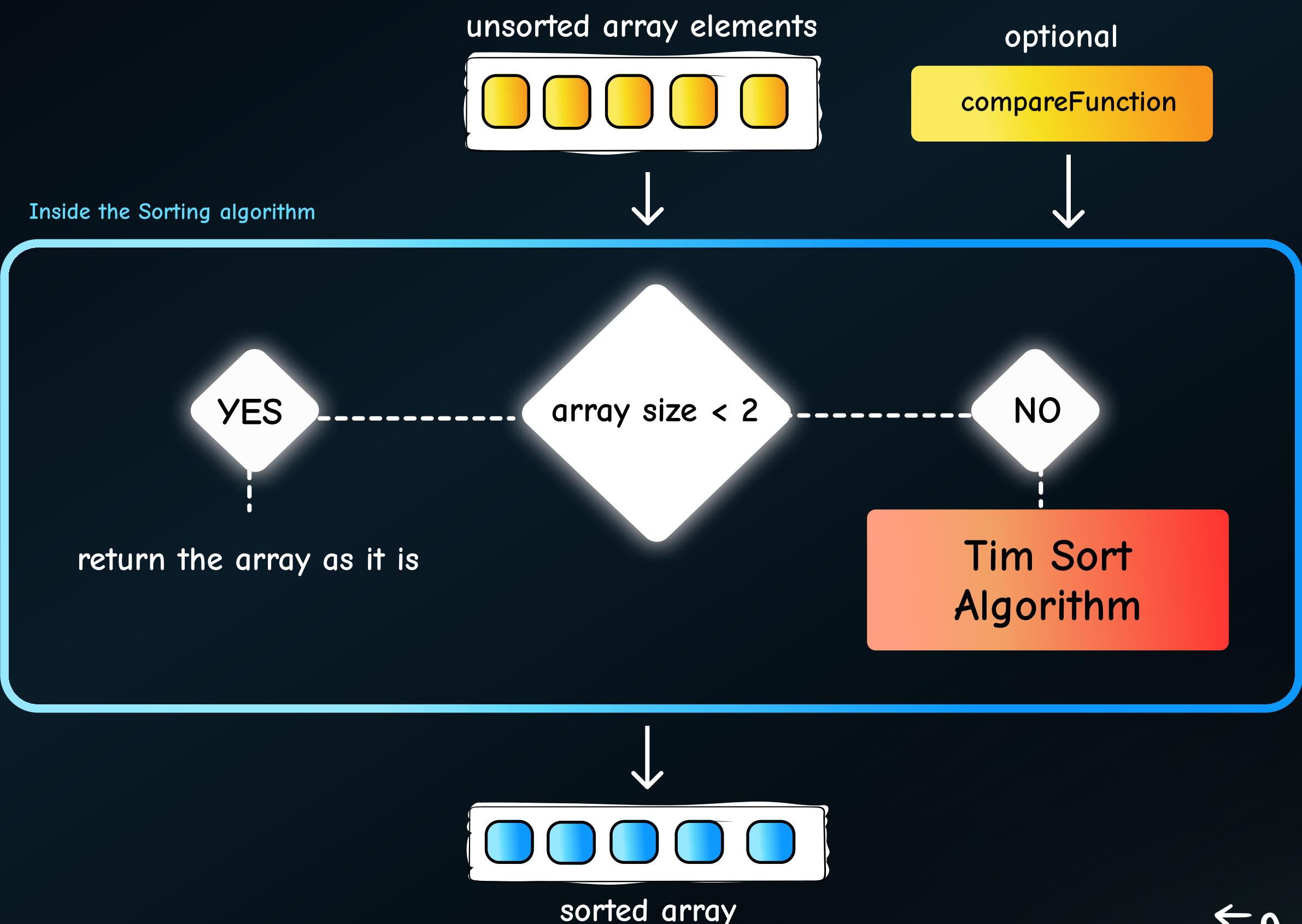


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What is that sort algorithm ?

Our JS engine relies on a very popular sorting algorithm internally

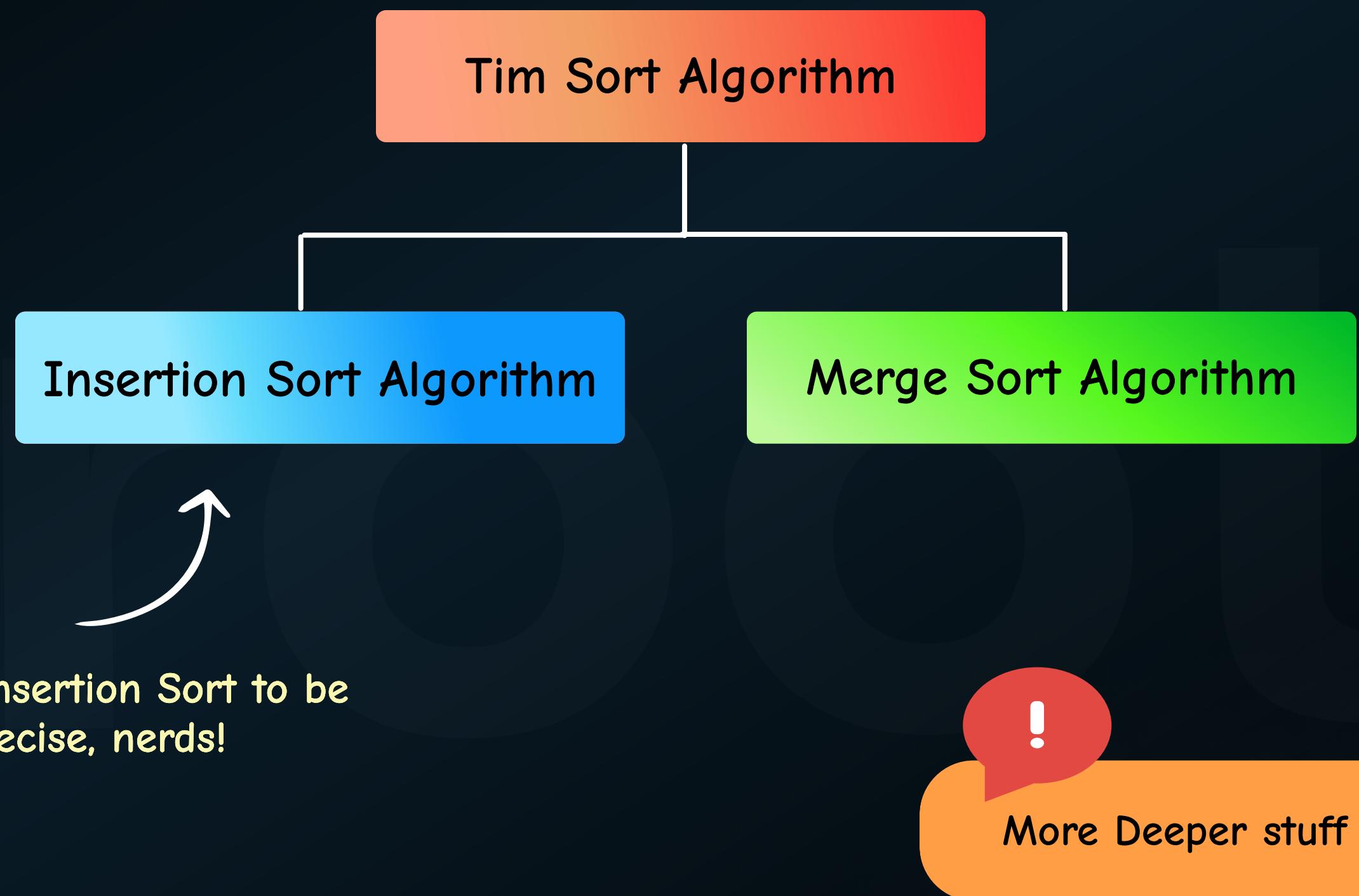


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What is this TimSort thingy . . . ?

It's a hybrid sorting algorithm which uses a combination of two other well known sorting algorithms

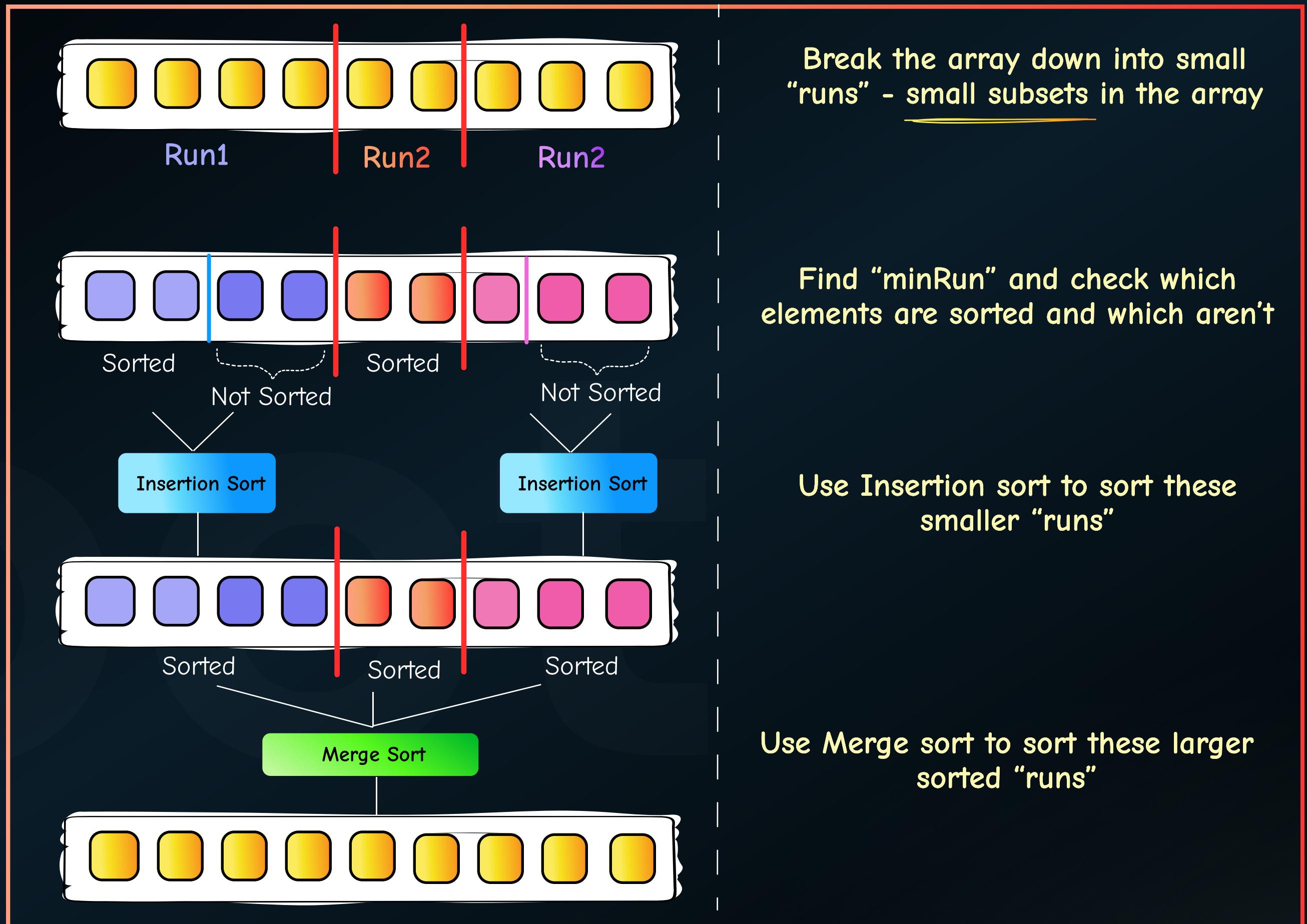


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Let's take a look at how it works

Tim Sort Algorithm high level overview



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That's a wrap

That's a very high level overview of what's going on with that `sort()` method

Understanding these sorting algorithms is some beauty in itself. Look it up online



I hope you've learnt something new today



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