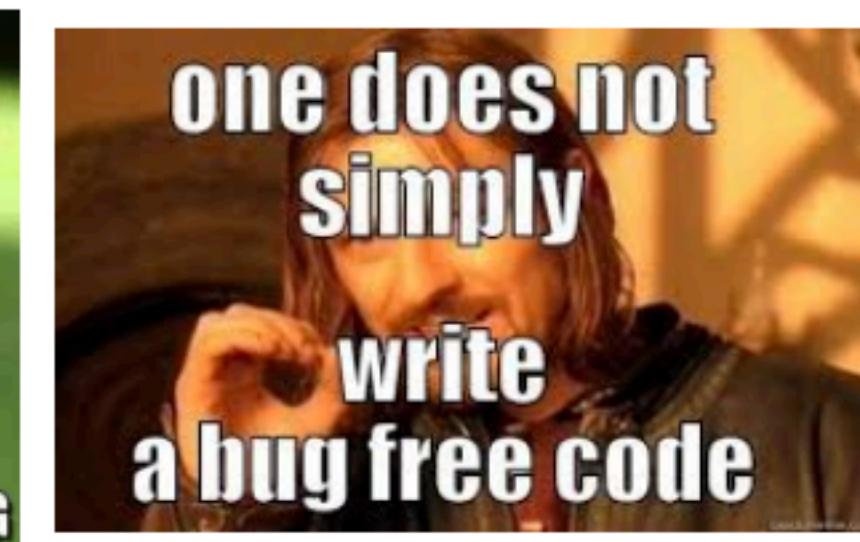
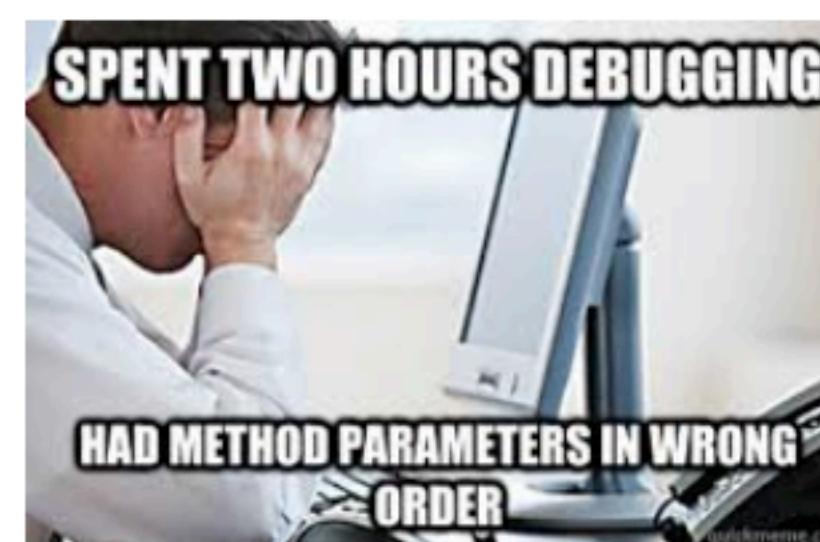
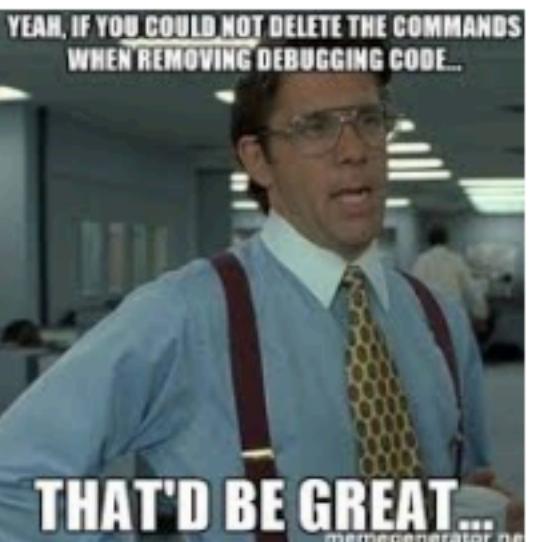
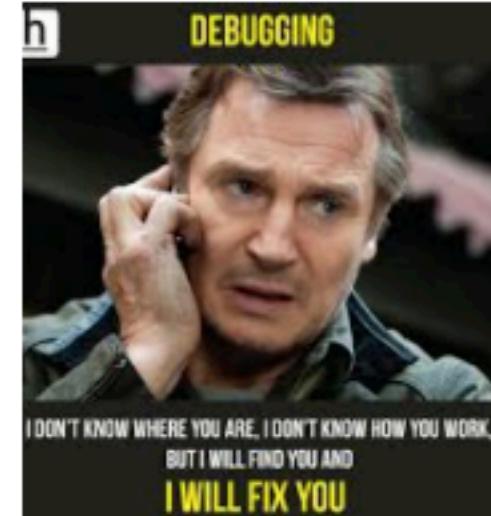
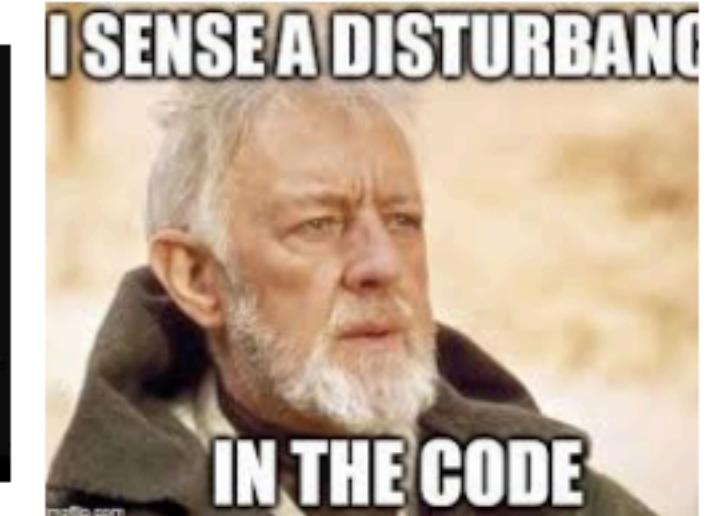
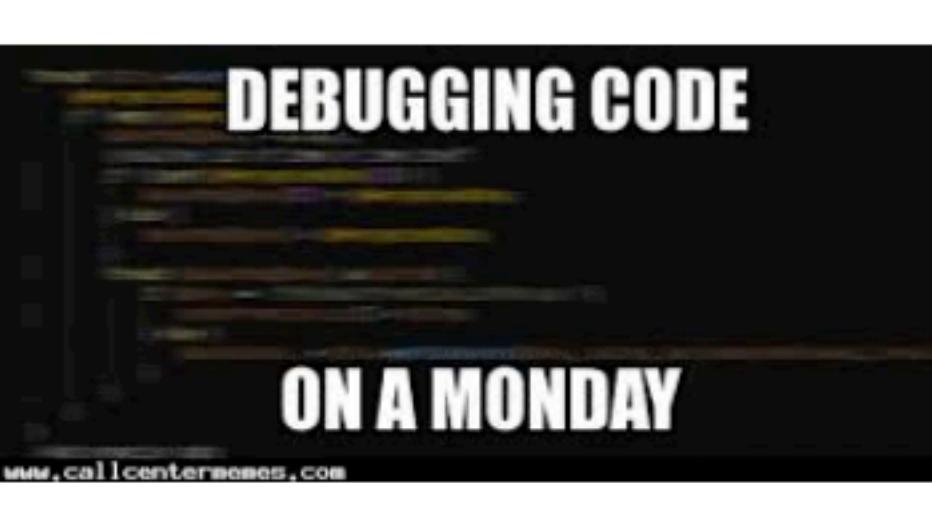
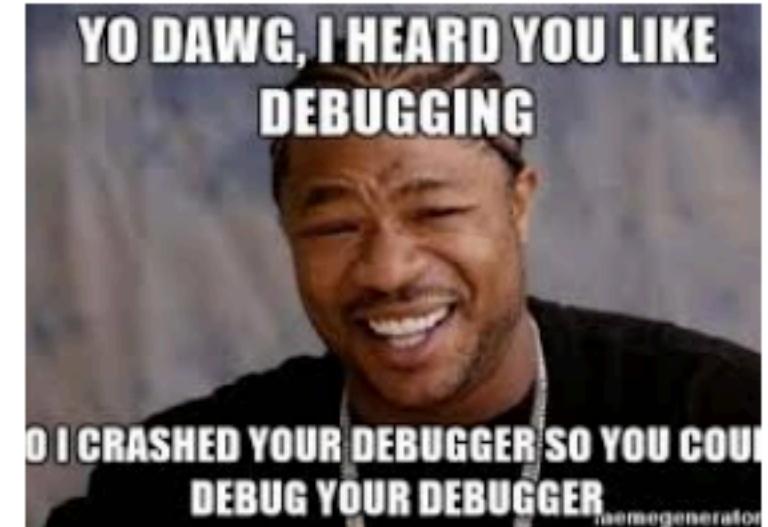
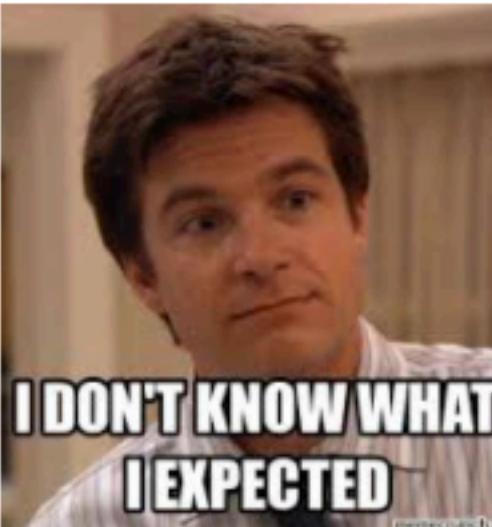
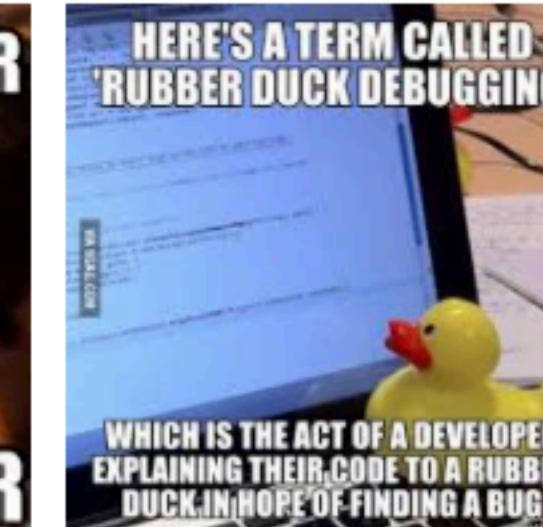
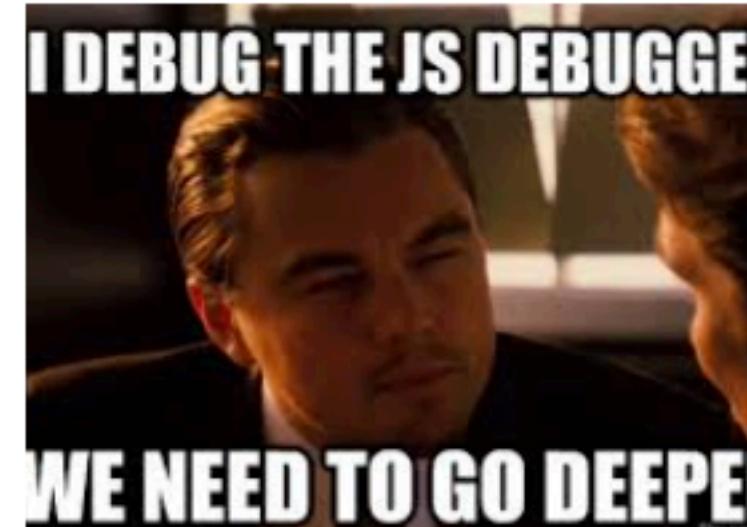
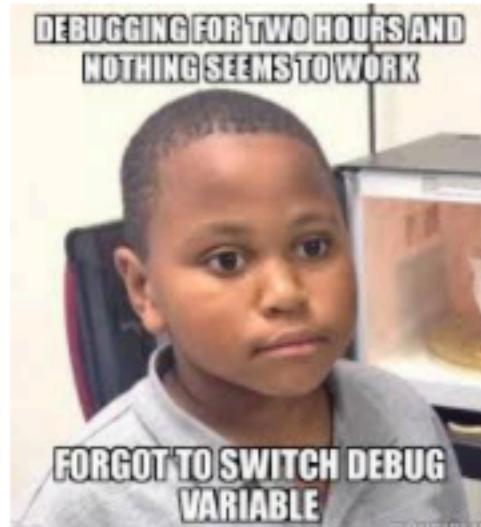
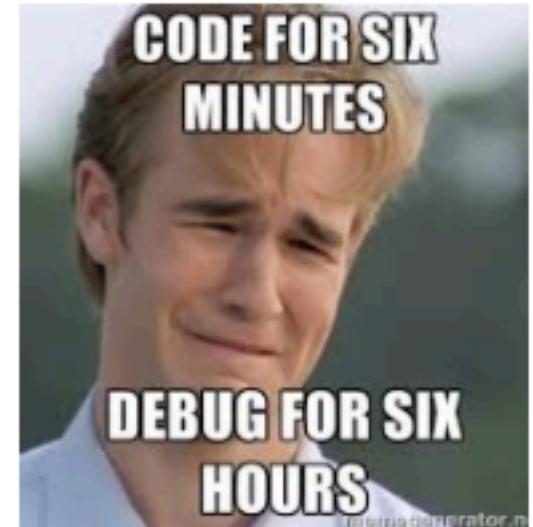
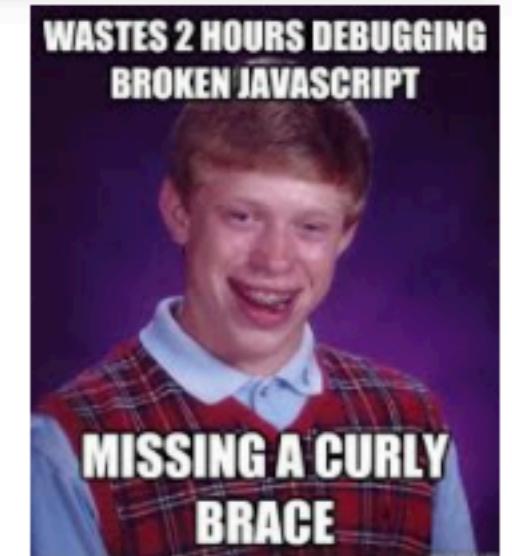
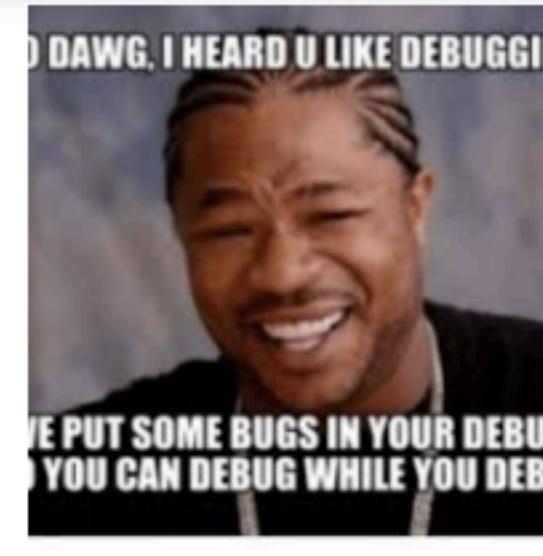
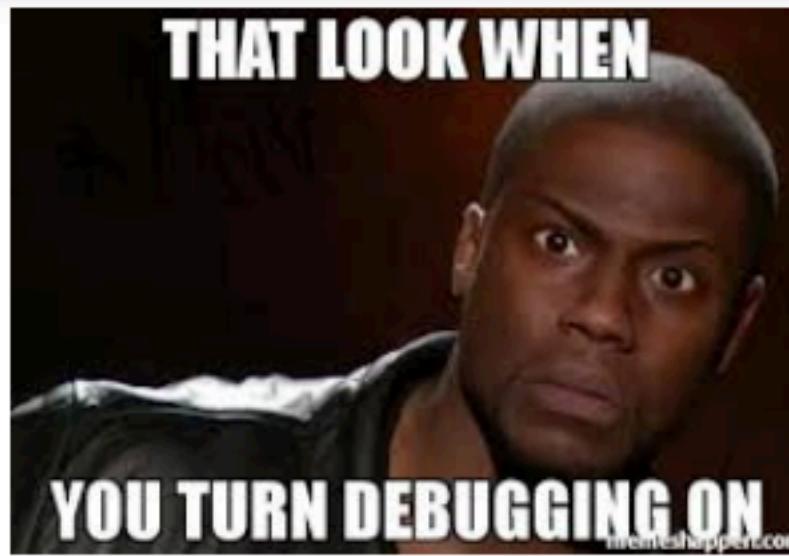


DEBUGGING





debugging meme



92

9/9

0800 An-tam started
1000 . stopped - an-tam ✓
13"sec (033) MP-MC { 1.2700 9.037 847 025
033 PRO 2 2.130476415
const 2.130676415

Relays 6-2 on 033 failed special speed test
in relay 10,000 test.

1100 1525 Started Cosine Tape (Sine check)
Started Multi Adder Test.

1545 Relay #70 Panel F
(moth) in relay.

1625 1630 An-tam started.
1700 closed down.



Concr 2.1506, 6913
Relays 6-2 in 033 failed special speed test
in Relay " 10.00 test -

Relays changed
1100 Started Cosine Tape (Sine check)
1525 Started Mult+ Adder Test.

1545



Relay #70 Panel F
(moth) in relay.

First actual case of bug being found.
~~1620~~ 1630 Arctangent started.
1700 closed down.

Conc 2.1506, 6913
Relays 6-2 in 033 failed special speed test
in Relay " 10.00 test -

1100 Started Cosine Tape (Sine check)
1525 Started Mult+ Adder Test.

1545

Delay #70 Panel F
both) in relay.

1630

First actual

1700

arctangent

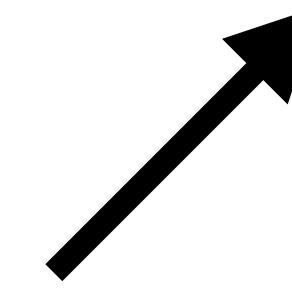
closed

being found.



“It doesn’t work!”

Bug!



“It doesn’t work!”

“Why is it doing that?”

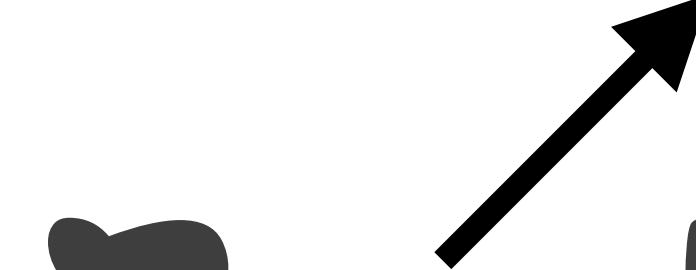
Bug!

“Why is it doing that?”



“That’s weird.”

Bug!



“That’s weird.”

```
const foo = `bar;
```

```
function bar () {  
}  
}
```

"We can't send [email]
more than 500 miles"

<https://www.ibiblio.org/harris/500milemail.html>



“Programmers Debugging Software”

It is not so bad.

novice

20x

Time to debug

expert

1x



What You'll Learn Today



BU**J****G**

The letters B, U, J, G are rendered in a large, bold, dark gray font. Four blue butterflies with black outlines are placed on the letters: one on the top left of the B, one on the bottom right of the U, one on the top right of the J, and one on the bottom left of the G.

Prevention
Detection
Diagnosis
Fixing

PREVENTION

PREVENTION

“Debugging is twice as hard as writing the code in the first place.

Therefore, if you write the code as cleverly as possible, you are,

by definition, not smart enough to debug it.”

– Brian W. Kernaghan

PREVENTION

PREVENTION



Readability > smallness

PREVENTION

- 🐛 Readability > smallness
- 🐛 Simple > clever

PREVENTION

- 🐛 Readability > smallness
- 🐛 Simple > clever
- 🐛 git hygiene

PREVENTION

- 🐛 Readability > smallness
- 🐛 Simple > clever
- 🐛 git hygiene
- 🐛 Formatting matters!

PREVENTION

```
1 async function main
2   () {
3     try { throws();
4   } catch (err) {console.log('caught')} }
```

indentation matters

PREVENTION

```
1 async function main () {  
2   try {  
3     throws();  
4   }  
5   catch (err) {  
6     console.log('caught');  
7   }  
8 }
```

indentation matters

PREVENTION

PREVENTION

- 🐛 Readability > smallness
- 🐛 Simple > clever
- 🐛 git hygiene
- 🐛 Formatting matters!

PREVENTION

- 🐛 Readability > smallness
- 🐛 Simple > clever
- 🐛 git hygiene
- 🐛 Formatting matters!
- 🐛 Use functions in your favor
 - ▶ Prefer small, single-purposed and pure functions

PREVENTION

```
1 let result
2 const add (a, b) => {
3   result = a + b
4 }
5 add(10, 20)
6 console.log(result)
```

avoid side-effects

PREVENTION

```
1 const add = (a, b) => a + b  
2 console.log(add(10, 20))
```

avoid side-effects

PREVENTION

```
1 const addOrSubtract = (a, b, operation) =>  
2   operation === 'add' ? a + b : a - b
```

single-purpose functions

PREVENTION

```
1 const add = (a, b) => a + b  
2 const subtract = (a, b) => a - b
```

single-purpose functions

PREVENTION

Tools can get help.

PREVENTION



linter
auto-formatter

PREVENTION



PREVENTION

