DEALING WITH /REGEXION/

SELF.CONFERENCE
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JUNE 8, 2019

- @TMIKESCHU
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-  
- TED

computer science in every high school

Microsoft Philanthropies

tealsk12.org

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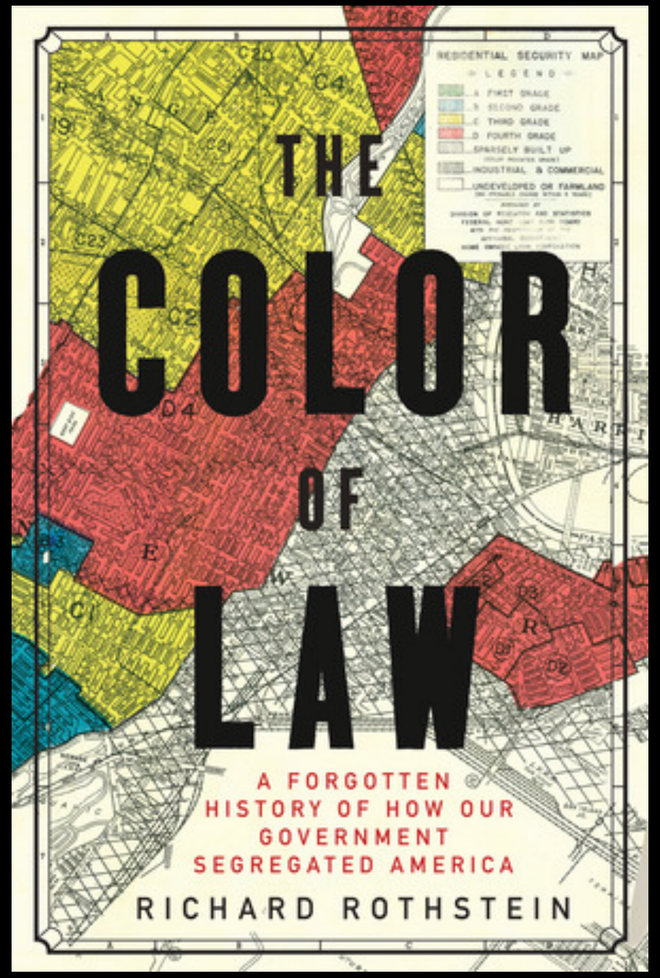


- HTTPS://WWW.EPI.ORG/PUBLICATION/THE-COLOR-OF-LAW-A-FORGOTTEN-HISTORY-OF-HOW-OUR-GOVERNMENT-SEGREGATED-AMERICA/

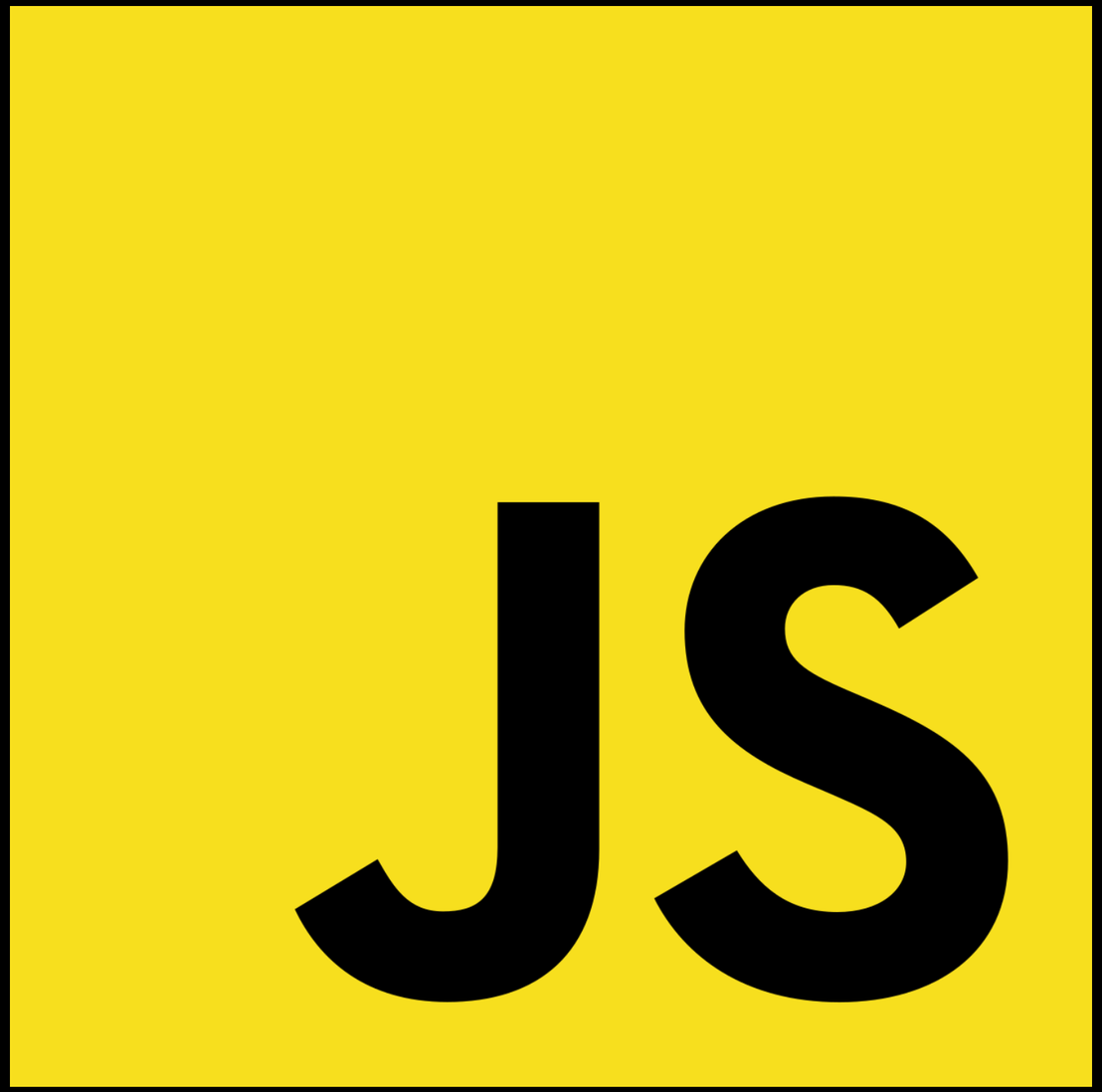
VICTORY CONDITIONS

- FEEL AT PIECE WITH THE CRAZINESS OF REGEX
- HAVE A FEW STRATEGIES FOR DECIDING WHEN TO USE REGEX
- BE LIKE "WOW CAPTURE GROUPS ARE AMAZING"

ROADMAP

- MY SOAPBOX: WHY REGEX SHOULD BE MESSY
- BRIEF OVERVIEW OF REGULAR EXPRESSIONS
- WHEN TO USE REGEX
- CAPTURE GROUPS

DISCLAIMER




ME USING REGEX

HOW TO DEAL WITH /REGEXION/:

STRINGS AND LANGUAGE

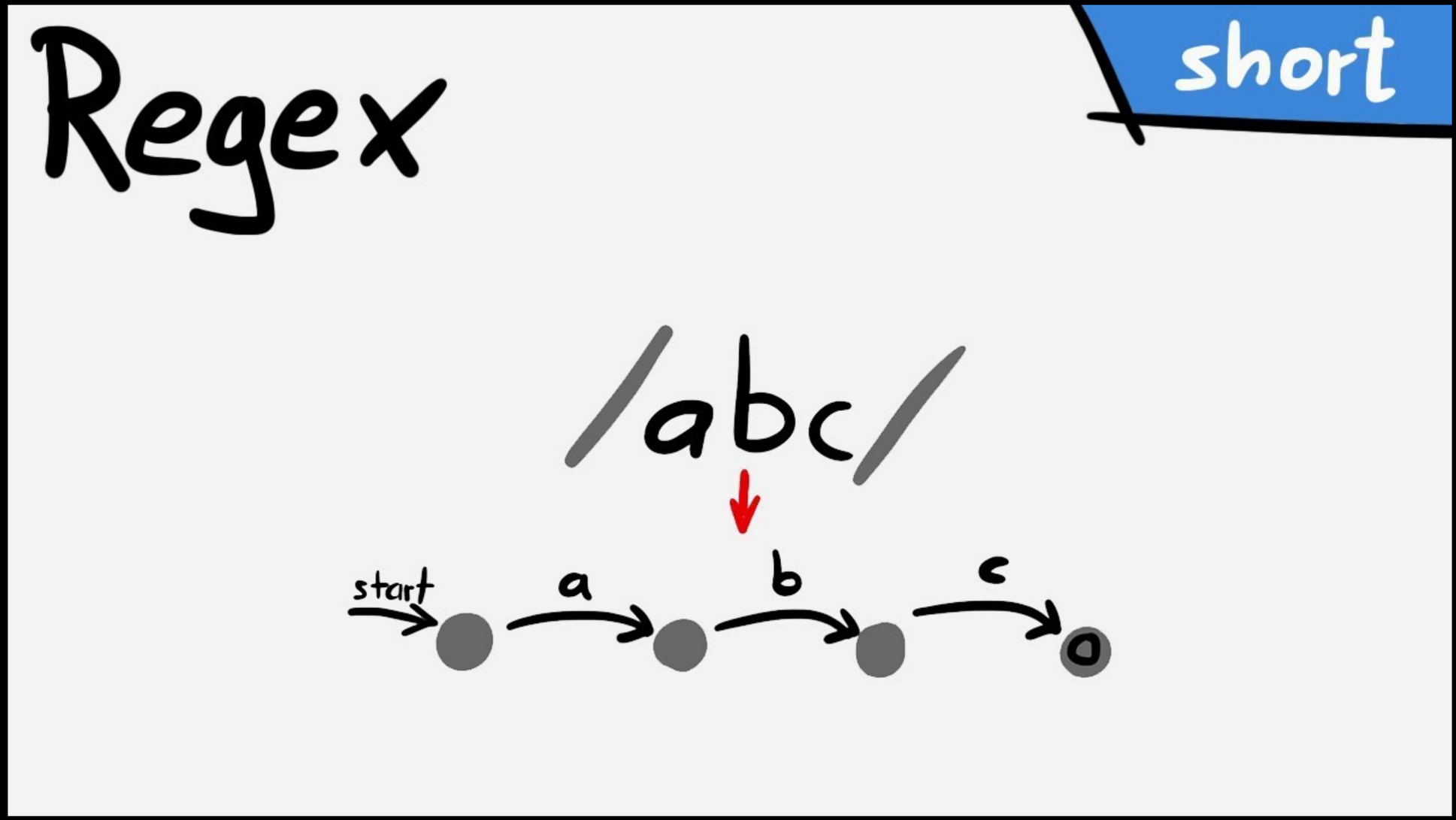
- TYPOS
- DUPLICATION
- PATTERNS
- FORMATS
- REPETITION

ACCEPT IT

- REGEX IS MESSY
- BECAUSE STRING DATA IS MESSY
- BECAUSE LANGUAGE IS MESSY

REGULAR EXPRESSIONS: AN OVERVIEW

- BORN IN 1951
- POPULARIZED IN 1968
  - TEXT EDITOR SEARCH
  - LEXICAL ANALYSIS
- POSIX. PERL. PCRE
- FINITE STATE MACHINE



HTTPS://WWW.YOUTUBE.COM/WATCH?V=HPRXXJHQVFQ

CODE THAT WANTS TO BE REGEXED

IF YOU ASK MORE THAN ONE QUESTION ABOUT A STRING...

DITCH && AND || FOR //

```
- someString.startsWith(":") &&
-   someString.split("").some(char => Boolean(Number(char)))
+ /^:.*\d/.test(someString)

- someString.includes("someWord") || someString.includes("someOtherWord");
+ /someWord|someOtherWord/.test(someString)
```

(ARRAY OF CHARACTERS).CONTEXT < (STRING).CONTEXT

REGEX FORCES YOU TO CONSIDER THE STRING AS (MORE OF) A WHOLE

METHODS TO USE

- CHANGE FORMAT
  - STRING.PROTOTYPE.REPLACE (=> STRING)
- GET SUBSTRING(S)
  - STRING.PROTOTYPE.MATCH (=> ARRAY)
- ASSERT STRING QUALITIES
  - REGEX.PROTOTYPE.TEST (=> BOOLEAN)
- STATEFUL SEARCH
  - REGEX.PROTOTYPE.EXEC (=> ARRAY)

YOU KNOW WHAT THOSE PARENTHESES IN REGULAR EXPRESSIONS ARE. RIGHT?

```
/(\d+)/;
```

CAPTURE GROUPS: KEEP IT TOGETHER

/ ( ) /

- IS FAMILIARITY WORTH RIGIDITY?
- IS DIFFICULTY WORTH FLEXIBILITY?

IS DIFFICULTY WORTH FLEXIBILITY? ✅

TASK

CREATE A FUNCTION THAT

- TAKES IN A NAME IN `First Last` FORMAT
- AND RETURNS THE NAME IN `Last, First` FORMAT

```
const albus = "Albus Dumbledore";

function lastFirst(name) {
  // TODO
}
console.log(lastFirst(albus)); // => "Dumbledore, Albus"
```

APPROACH #1: SPLIT

```
function lastFirst(name) {
  return name
    .split(" ")
    .reverse()
    .join(", ");
}
console.log(lastFirst(albus)); // => "Dumbledore, Albus"
```

APPROACH #2: REGEX

```
function lastFirst(name) {
  const reFirstLast = /(\w+)\s(\w+)/;
  return name.replace(reFirstLast, "$2, $1");
}
console.log(lastFirst(albus)); // => "Dumbledore, Albus"
```

-

```
someString.replace(/(cats)(dogs)/, (full, group1, group2) => {
  // do stuff with the groups
});
```

- https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/String/replace#Specifying_a_function_as_a_parameter

CHANGE ALERT

> ...MIDDLE NAMES TOO.

```
const albus = "Albus Percival Dumbledore";

fullName(albus); // => "Dumbledore, Albus Percival"
```

APPROACH #1: SPLIT

```
function lastFirst(name) {
  return name
    .split(" ")
    .reverse()
    .join(", ");
}
console.log(lastFirst(albus)); // => "Dumbledore, Percival, Albus"
```

```
function lastFirst(rawName) {
  const names = rawName.split(" ");
  const maxIndex = names.length - 1;
  const last = names[maxIndex];
  const rest = names.slice(0, maxIndex);

  return `${last}, ${rest.join(" ")}`;
}

console.log(lastFirst(albus)); // => "Dumbledore, Albus Percival"
```

APPROACH #2: REGEX

```
function lastFirst(name) {
  const reFirstLast = /(\w+)\s(\w+)/;
  return name.replace(reFirstLast, "$2, $1");
}
console.log(lastFirst(albus)); // => "Percival, Albus Dumbledore"
```

```
function lastFirst(name) {
  const reFirstLast = /(\w+\s*\w*)\s(\w+)/;
  return name.replace(reFirstLast, "$2, $1");
}
console.log(lastFirst(albus)); // => "Dumbledore, Albus Percival"
```

```
- /(\w+)\s(\w+)/;
+ /(\w+\s*\w*)\s(\w+)/;
```

COMPARISON

SPLIT

- CALCULATING INDICES
- ACCOMMODATING FOR ZERO-BASED COUNTING
- ARRAY.PROTOTYPE METHODS
- STRING INTERPOLATION

COMPARISON

REGEX

- PATTERNS
- THERE IS A FIRST BIT
- AND A LAST BIT
- AND SOMETIMES EXTRA MIDDLE BITS IN THE FIRST BIT

THAT IS MESSY

THAT IS OKAY

THAT IS AWESOME

CHANGE ALERT

- ...MIDDLE NAMES TOO
- ...MULTIPLE MIDDLE NAMES

```
const albus = "Albus Percival Wulfric Brian Dumbledore";
lastFirst(albus); // => "Dumbledore, Albus Percival Wulfric Brian"
```

APPROACH #1: SPLIT

```
function lastFirst(rawName) {
  const names = rawName.split(" ");
  const maxIndex = names.length - 1;
  const last = names[maxIndex];
  const rest = names.slice(0, maxIndex);

  return `${last}, ${rest.join(" ")}`;
}

console.log(lastFirst(albus)); // => "Dumbledore, Albus Percival Wulfric Brian"
```

APPROACH #2: REGEX

```
function lastFirst(name) {
  const reFirstLast = /(\w+\s*\w*)\s(\w+)/;
  return name.replace(reFirstLast, "$2, $1");
}
console.log(lastFirst(albus)); // => "Wulfric, Albus Percival Brian Dumbledore"
```

```
- const reFirstLast = /(\w+\s*\w*)\s(\w+)/;
+ const reFirstLast = /(\w+(\s\w+)*)\s(\w+)/;
```

```
function lastFirst(name) {
  const reFirstLast = /(\w+(\s\w+)*)\s(\w+)/;
  return name.replace(reFirstLast, "$3, $1");
}
console.log(lastFirst(albus)); // => "Dumbledore, Albus Percival Wulfric Brian"
```

CHANGE ALERT

- ...MIDDLE NAMES TOO
- ...MULTIPLE MIDDLE NAMES
- ...SUFFIXES TOO

```
const albus = "Albus Percival Wulfric Brian Dumbledore, Jr.";
lastFirst(albus); // => "Dumbledore, Albus Percival Wulfric Brian, Jr."
```

APPROACH #1: SPLIT

```
function lastFirst(rawName) {
  const names = rawName.split(" ");
  const maxIndex = names.length - 1;
  const last = names[maxIndex];
  const rest = names.slice(0, maxIndex);

  return `${last}, ${rest.join(" ")}`;
}

console.log(lastFirst(albus)); // => "Jr., Albus Percival Wulfric Brian Dumbledore,"
```

```
function lastFirst(rawName) {
  const [name, suffix] = rawName.split(", ");
  const names = name.split(" ");
  const maxIndex = names.length - 1;
  const last = names[maxIndex];
  const rest = names.slice(0, maxIndex);

  const output = `${last}, ${rest.join(" ")}`;
  if (suffix) {
    return `${output}, ${suffix}`;
  }
  return output;
}

console.log(lastFirst(albus)); // => "Dumbledore, Albus Percival, Jr."
```

APPROACH #2: REGEX

```
function lastFirst(name) {
  const reFirstLast = /(\w+(\s\w+)*)\s(\w+)/;
  return name.replace(reFirstLast, "$3, $1");
}
console.log(lastFirst(albus)); // => "Dumbledore, Albus Percival, Jr."
```

CHANGE ALERT

- ...MIDDLE NAMES TOO
- ...MULTIPLE MIDDLE NAMES
- ...SUFFIXES TOO
- ...JUST FIRST NAME IS OKAY ¯_(ツ)_/¯

```
const albus = "Albus";
lastFirst(albus); // => "Albus"
```

APPROACH 1: SPLIT

```
function lastFirst(rawName) {
  const [name, suffix] = rawName.split(", ");
  const names = name.split(" ");
  const maxIndex = names.length - 1;
  const last = names[maxIndex];
  const rest = names.slice(0, maxIndex);

  const output = `${last}, ${rest.join(" ")}`;
  if (suffix) {
    return `${output}, ${suffix}`;
  }
  return output;
}

console.log(lastFirst(albus)); // => "Albus,"
```

```
function lastFirst(rawName) {
  const [name, suffix] = rawName.split(", ");
  const names = name.split(" ");
  const maxIndex = names.length - 1;
  const last = names[maxIndex];
  const rest = names.slice(0, maxIndex);

  const output = `${last}, ${rest.join(" ")}`;
  if (suffix) {
    return `${output}, ${suffix}`;
  }
  if (output.endsWith(",")) {
    return output.slice(0, output.length - 1);
  }
  return output;
}
```

```
  const output = `${last}, ${rest.join(" ")}`;
  if (suffix) {
    return `${output}, ${suffix}`;
  }
+ if (output.endsWith(",")) {
+   return output.slice(0, output.length - 1);
+ }
  return output
```

```
function lastFirst(rawName) {
  const [name, suffix] = rawName.split(", ");
  const names = name.split(" ");
  const maxIndex = names.length - 1;
  const last = names[maxIndex];
  const rest = names.slice(0, maxIndex).join(" ");

  let output = last;
  if (Boolean(rest)) {
    output += `, ${rest}`;
  }

  if (suffix) {
    output += `, ${suffix}`;
  }
  return output;
}
```

```
- const output = `${last}, ${rest.join(" ")}`;
- if (suffix) {
-   return `${output}, ${suffix}`;
- }
- if (output.lastIndexOf(",") === output.length) {
-   return output.slice(0, output.length - 1);
- }
+ let output = last;
+ if (Boolean(rest)) {
+   output += `, ${rest}`;
+ }

+ if (suffix) {
+   output += `, ${suffix}`;
+ }
  return output;
```

APPROACH #2: REGEX

```
function lastFirst(name) {
  const reFirstLast = /(\w+(\s\w+)*)\s(\w+)/;
  return name.replace(reFirstLast, "$3, $1");
}
console.log(lastFirst(albus)); // => "Albus"
```

```
const reFirstLast = /(\w+(\s\w+)*)\s(\w+)/;
```

FLEXIBILITY > READABILITY

...ABOUT "READABILITY"

- IS GERMAN READABLE?

REVIEW

- RICH HISTORY SPECIFICALLY DESIGNED FOR ANALYZING AND SEARCHING TEXT
- REGEX IS MESSY BECAUSE STRING DATA IS MESSY BECAUSE LANGUAGE IS MESSY
- IF YOU HAVE MORE THAN ONE QUESTION ABOUT YOUR STRING...
- CAPTURE GROUPS ARE GREAT FOR MANIPULATING SUBSTRINGS

GO FORTH AND PARSE YOUR STRINGS!

EMBRACE THE /PAIN/!

DON'T FEAR /REGEXION/!

RESPONSE /GRACEFULLY/ TO CHANGE 😄

THANK YOU!

RESOURCES

- REPL-ISH TOOL: HTTPS://REGEXR.COM/
- CHEAT SHEET: ://WWW.REXEGG.COM/REGEX-QUICKSTART.HTML
- WIKI: HTTPS://EN.WIKIPEDIA.ORG/WIKI/REGULAR_EXPRESSION
- NAMED CAPTURE GROUPS: HTTPS://GITHUB.COM/TC39/PROPOSAL-REGEXP-NAMED-GROUPS