Regex De-Mystified

Do you feel a sense of dread when you hear the term "regular expression"? Well, fear no more! Let's cover the basics.

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Hi, I'm Lea Ann

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Our Goals for Tonight

- What are Regular Expressions?
- Learn some basics (using JavaScript)
- See some examples
- Take home some practice exercises

You will NOT leave tonight with a Master's degree in Regex

You WILL leave with the confidence to recognize and use regular expressions

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Why are programmers afraid of regex?

- Another new language to learn
- It looks crazy
- Other devs tell you to “beware”

```
(?:(?:\r\n)?[ \t])*(?:(?:(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(?:\r\n)?[ \t]
)+|\Z|(?=[\["()<>@,;:\\".\[\]]))|"(?:[^\"\r\\]|\\.|(?:(?:\r\n)?[ \t]))*"(?:(?:
\r\n)?[ \t])*)(?:\.(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(
?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|"(?:[^\"\r\\]|\\.|(?:(?:\r\n)?[
\t]))*"(?:(?:\r\n)?[ \t])*))*@(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\0
31]+(?:(?:(?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|\[([^\[\]\r\\]|\\.)*\
](?:(?:\r\n)?[ \t])*)(?:\.(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\031]+
(?:(?:(?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|\[([^\[\]\r\\]|\\.)*\](?:
(?:\r\n)?[ \t])*))*|(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(?:\r\n)?[ \t])+|\Z
|(?=[\["()<>@,;:\\".\[\]]))|"(?:[^\"\r\\]|\\.|(?:(?:\r\n)?[ \t]))*"(?:(?:\r\n)
?[ \t])*)*\<(?:(?:\r\n)?[ \t])*(?:@(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(?:\
r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|\[([^\[\]\r\\]|\\.)*\](?:(?:\r\n)?[
 \t])*(?:,@(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(?:\r\n)?[
 \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|\[([^\[\]\r\\]|\\.)*\](?:(?:\r\n)?[ \t])*
)(?:\.(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(?:\r\n)?[ \t]
)+|\Z|(?=[\["()<>@,;:\\".\[\]]))|\[([^\[\]\r\\]|\\.)*\](?:(?:\r\n)?[ \t])*))*)
*:(?:(?:\r\n)?[ \t])*)?(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(?:\r\n)?[ \t])+
|\Z|(?=[\["()<>@,;:\\".\[\]]))|"(?:[^\"\r\\]|\\.|(?:(?:\r\n)?[ \t]))*"(?:(?:\r
\n)?[ \t])*)(?:\.(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?:(?:
\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|"(?:[^\"\r\\]|\\.|(?:(?:\r\n)?[ \t
]))*"(?:(?:\r\n)?[ \t])*)*@(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\031
]+(?:(?:(?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|\[([^\[\]\r\\]|\\.)*\](
?:(?:\r\n)?[ \t])*)(?:\.(?:(?:\r\n)?[ \t])*(?:[^()<>@,;:\\".\[\] \000-\031]+(?
:(?:(?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|\[([^\[\]\r\\]|\\.)*\](?:(?
:\r\n)?[ \t])*)*\>(?:(?:\r\n)?[ \t])*)|(?:[^()<>@,;:\\".\[\] \000-\031]+(?:(?
:(?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|"(?:[^\"\r\\]|\\.|(?:(?:\r\n)?
[ \t]))*"(?:(?:\r\n)?[ \t])*)*:(?:(?:\r\n)?[ \t])*(?:(?:(?:[^()<>@,;:\\".\[\]
\000-\031]+(?:(?:(?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|"(?:[^\"\r\\]|
\\.|(?:(?:\r\n)?[ \t]))*"(?:(?:\r\n)?[ \t])*)(?:\.(?:(?:\r\n)?[ \t])*(?:[^()<>
@,;:\\".\[\] \000-\031]+(?:(?:(?:\r\n)?[ \t])+|\Z|(?=[\["()<>@,;:\\".\[\]]))|"
(?:[^\"\r\\]|\\.|(?:(?:\r\n)?[ \t]))*"(?:(?:\r\n)?[ \t])*))*@(?:(?:\r\n)?[ \t]
```

(Portion of regex to validate an email address)

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“Some people, when confronted with a problem, think "I know, I'll use regular expressions." Now they have two problems.”

–Jamie Zawinski

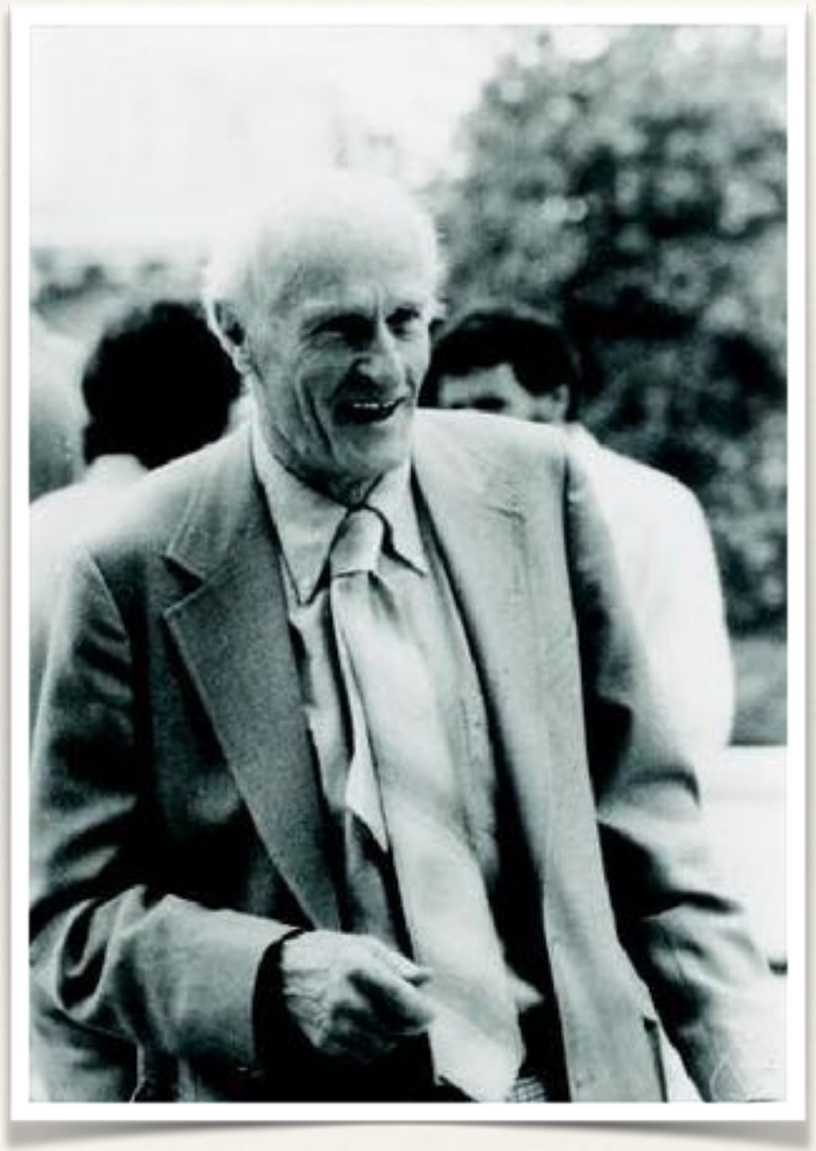
What's the Regex Truth?

- It is an important tool to add to your toolbox.
- It is a tool, not a solution to every problem
- Over-using regular expressions can come back to bite you
- Like hot sauce, use in moderation, but adds important flavor
- If you can learn to read code in another language, you can learn to read and write regex

What is "Regex"

- Regex is simply pattern matching on text
- Regex is built into some languages, like Ruby
- Regular expressions can have subtle differences between programming languages

“Regex” History



- Stephen Cole Kleene formalized the concept in the 1950s
- They entered popular use in 1968

“Regex” History

- Ken Thompson later integrated it into Unix editor
- This eventually led to “grep”, search tool using regular expressions

> *"grep" is a word derived from the command for regular expression searching in the ed editor:*
>
> `g/re/p` *meaning "Global search for Regular Expression and Print matching lines"*

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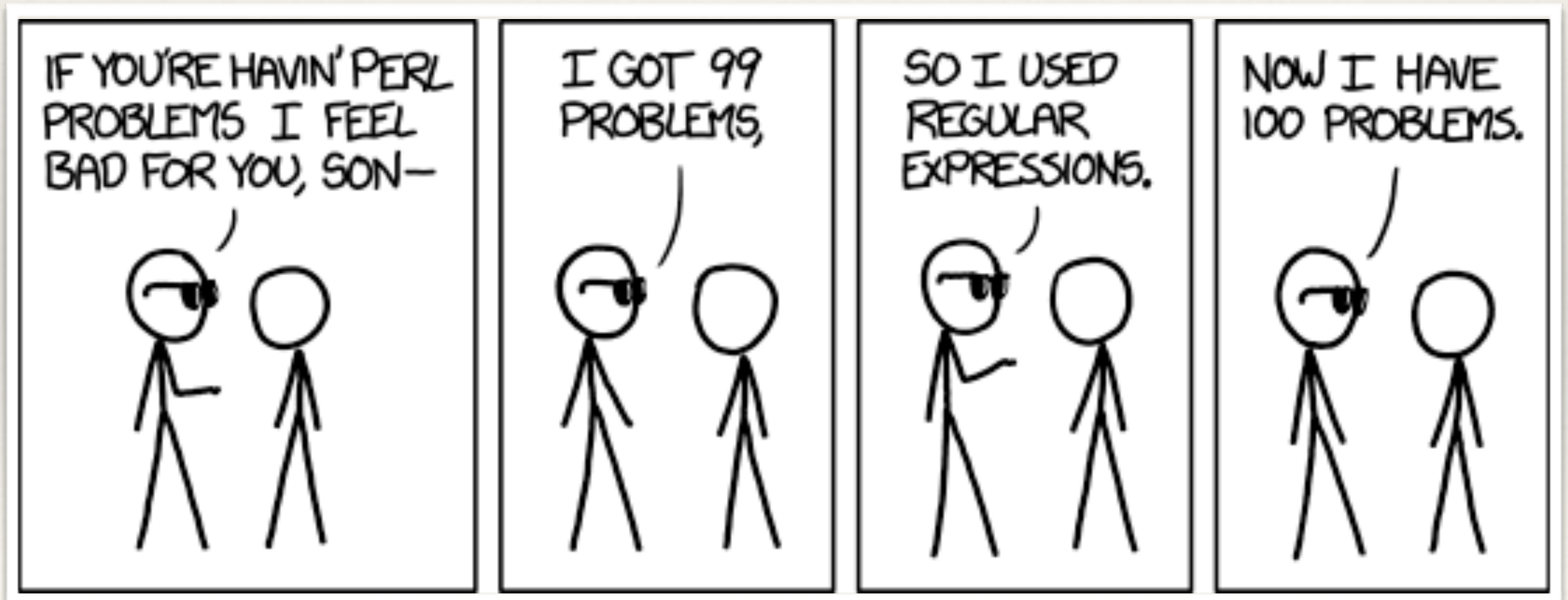
“Regex” History

- In the 1980’s, Perl developed more complex usage of regular expressions



XKCD comic: https://xkcd.com/1171/

“Regex” History

- Today regular expressions used or part of many languages, including Java, Python, Ruby and JavaScript

“Regex” Basics

We are going to focus the rest of our talk on the JavaScript RegEx Object

- A sequence of characters that define a search pattern
- Used to Search and Replace
- Used to perform Pattern Matching

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“Regex” Syntax

Define a pattern between “/“ and add any modifiers

```
/pattern/modifiers
```

```
/hello/i
/[a-z]/g
/^reg/
```

Modifiers

Modifies the search to make it more powerful

- i - case insensitive matching
- g - global matching (find all)
- m - multi-line matching
  (checks each line in a string)

```
// case insensitive,
// will match  a or A

 /a/i

// global, will match
// all instances of hello
 /hello/g

// multi-line, will
// match on all lines

 /hello/m
```

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Brackets

Allow you to search a range of characters

- [abc] - finds any character between the brackets
- [^abc] - finds any character not between the brackets
- [0-9] - finds any digit between the brackets
- (a|b) - finds any of the items separated by the | (like or)

```
// find all letters
  /[a-zA-Z]/

// find all digits
  /[0-9]/

// find all non-digits
  /[^0-9]/

// find both words
  /(foo|bar)/
```

Metacharacters

Characters that have special meaning

- \d - finds a digit
- \D - finds a non-digit
- \s - finds a whitespace character
- \S - finds a non-whitespace character
- \w - finds a word character
- \W - finds a non-word character
- \n - finds a new line character
- \b - find a match at the beginning or end
- \uxxx - finds a unicode character

```
// find all digits
  /\d/

// find whitespace
  /\s/

// find word character
  /\w/

// find a unicode character
  /\uxxx/
```

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Quantifiers

Define the quantities for the search

- + - find at least one
- * - find 0 or more
- ? - find 0 or one
- ^ - find starts with
- $ - find ends with
- ?= - finds followed by

```
// finds at least one
  /a+/

// finds 0 or more
  /a*/

// finds 0 or one
  /a?/

// find "starts with"
  /^a/

// find "ends with"
  /a$/

//finds "followed by"
  /?=a/
```

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Note the ^

```
^ inside the square brackets means "not included" in the string.
^ outside of the square brackets means "starts with" in the string.
```

```
// finds "starts with" com
  /^com/

// find non-digits
  /[^0-9]/
```

Methods

- exec() - returns the first match

```
> // exec() will return the matched string or null
  function myExec() {
      var str = "The real problem is not whether machines think but whether men do"
      var patt1 = /problem/gi
      var patt2 = /match/gi
      var res1 = patt1.exec(str)
      var res2 = patt2.exec(str)
      console.log("Do I match 'problem'? " + res1)
      console.log("Do I match 'match'? " + res2)
  }
<- undefined
> myExec()
  Do I match 'problem'? problem
  Do I match 'match'? null
<- undefined
```

Methods

- test() - returns true or false

```
> // test() will return boolean
  function myTest() {
    var str = "The only constant in the technology industry is change"
    var patt1 = /constant/gi
    var patt2 = /match/gi
    var res1 = patt1.test(str)
    var res2 = patt2.test(str)
    console.log("Do I match 'constant'? " + res1)
    console.log("Do I match 'match'? " + res2)
  }
<· undefined
> myTest()
  Do I match 'constant'? true
  Do I match 'match'? false
<· undefined
```

Example Time

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Questions?

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Thank you!

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