



Regular Expressions

Chapter 11



Python for Everybody
www.py4e.com



Regular Expressions

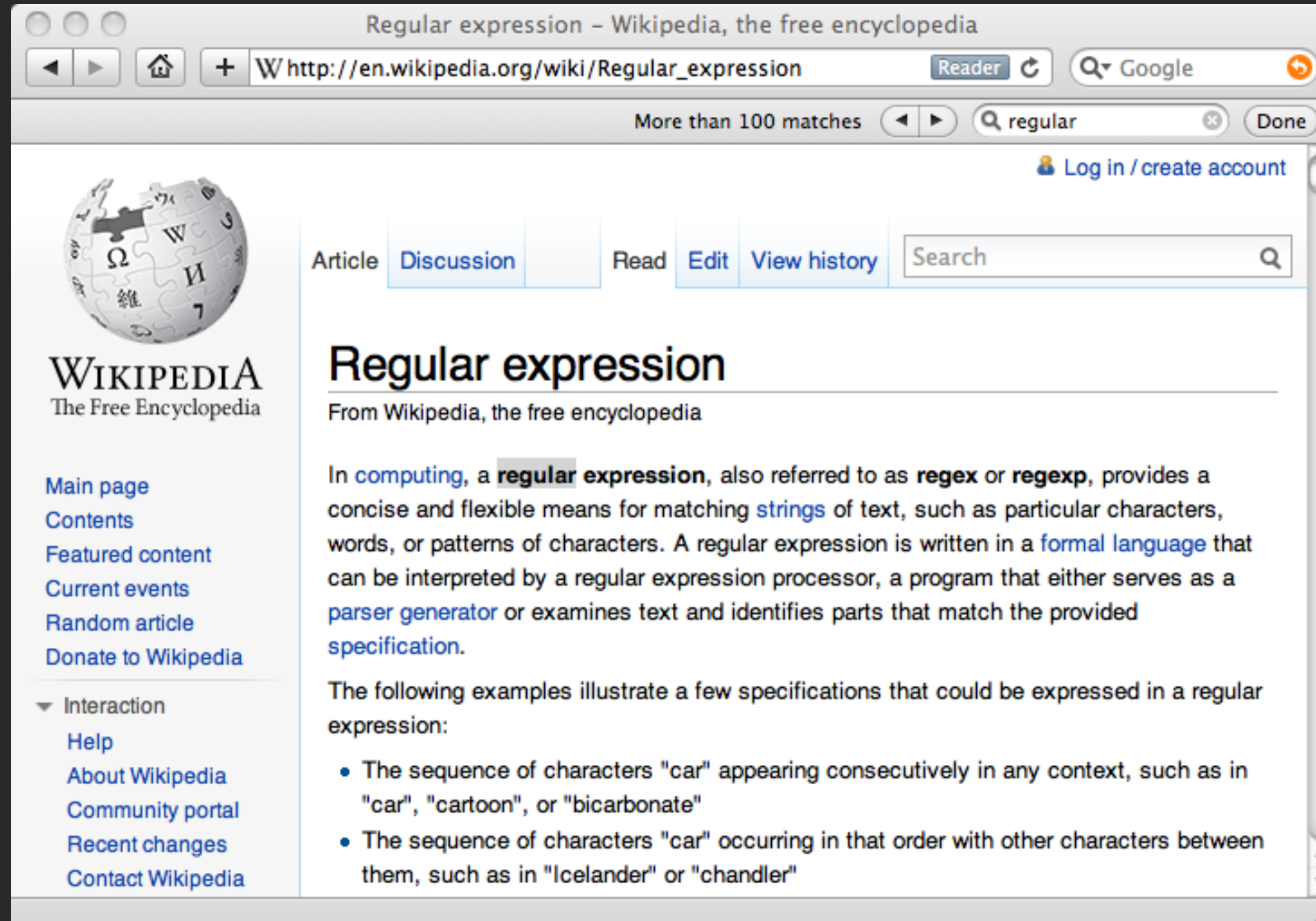
In computing, a regular expression, also referred to as “regex” or “regexp”, provides a concise and flexible means for matching strings of text, such as particular characters, words, or patterns of characters. A regular expression is written in a formal language that can be interpreted by a regular expression processor.

http://en.wikipedia.org/wiki/Regular_expression

Regular Expressions

Really clever “wild card” expressions for matching
and parsing strings

http://en.wikipedia.org/wiki/Regular_expression



Really smart “Find” or “Search”

Understanding Regular Expressions

- Very powerful and quite cryptic
- Fun once you understand them
- Regular expressions are a language unto themselves
- A language of “marker characters” - programming with characters
- It is kind of an “old school” language - compact



<http://xkcd.com/208/>

Regular Expression Quick Guide

<code>^</code>	Matches the beginning of a line
<code>\$</code>	Matches the end of the line
<code>.</code>	Matches any character
<code>\s</code>	Matches whitespace
<code>\S</code>	Matches any non-whitespace character
<code>*</code>	Repeats a character zero or more times
<code>*?</code>	Repeats a character zero or more times (non-greedy)
<code>+</code>	Repeats a character one or more times
<code>+?</code>	Repeats a character one or more times (non-greedy)
<code>[aeiou]</code>	Matches a single character in the listed set
<code>[^XYZ]</code>	Matches a single character not in the listed set
<code>[a-z0-9]</code>	The set of characters can include a range
<code>(</code>	Indicates where string extraction is to start
<code>)</code>	Indicates where string extraction is to end

<https://www.py4e.com/lectures3/Pythonlearn-11-Regex-Handout.txt>

The Regular Expression Module

- Before you can use regular expressions in your program, you must import the library using `import re`
- You can use `re.search()` to see if a string matches a regular expression, similar to using the `find()` method for strings
- You can use `re.findall()` to extract portions of a string that match your regular expression, similar to a combination of `find()` and slicing: `var[5:10]`

Using `re.search()` Like `find()`

```
hand = open('mbox-short.txt')
for line in hand:
    line = line.rstrip()
    if line.find('From:') >= 0:
        print(line)
```

```
import re

hand = open('mbox-short.txt')
for line in hand:
    line = line.rstrip()
    if re.search('From:', line) :
        print(line)
```

Using `re.search()` Like `startswith()`

```
hand = open('mbox-short.txt')
for line in hand:
    line = line.rstrip()
    if line.find('From:') >= 0:
        print(line)
```

```
import re

hand = open('mbox-short.txt')
for line in hand:
    line = line.rstrip()
    if re.search('From:', line) :
        print(line)
```

We fine-tune what is matched by adding special characters to the string

Wild-Card Characters

- The **dot** character matches any character
- If you add the **asterisk** character, the character is “any number of times”

```
X-Sieve: CMU Sieve 2.3
X-DSPAM-Result: Innocent
X-DSPAM-Confidence: 0.8475
X-Content-Type-Message-Body: text/plain
```

^ X . * :

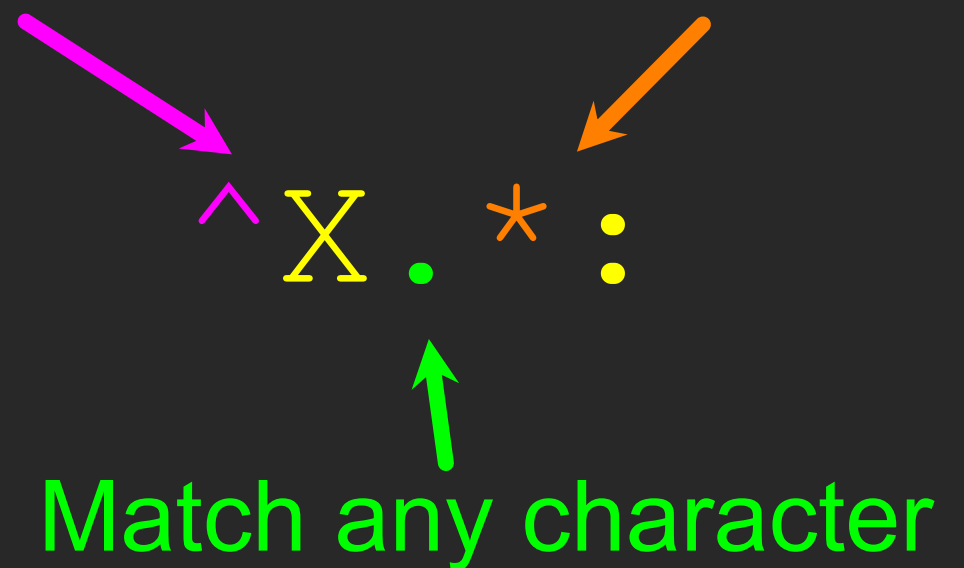
Wild-Card Characters

- The **dot** character matches any character
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X-Sieve: CMU Sieve 2.3
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```

Match the start of the
line

Many
times



^ X . * :

Fine-Tuning Your Match

Depending on how “clean” your data is and the purpose of your application, you may want to narrow your match down a bit

X-Sieve: CMU Sieve 2.3

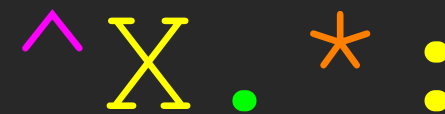
X-DSPAM-Result: Innocent

X-Plane is behind schedule: two weeks

Match the start
of the line

Many
times

Match any character

^X.*:

Fine-Tuning Your Match

Depending on how “clean” your data is and the purpose of your application, you may want to narrow your match down a bit

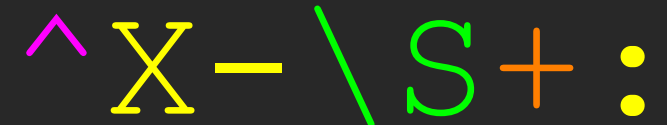
X-Sieve: CMU Sieve 2.3

X-DSPAM-Result: Innocent

X-Plane is behind schedule: two weeks

Match the start of
the line

One or more
times

^X-\S+

Match any non-whitespace character