



RUMAD

Rutgers Mobile App Development

Bonus Workshop 1: Regex, Overview

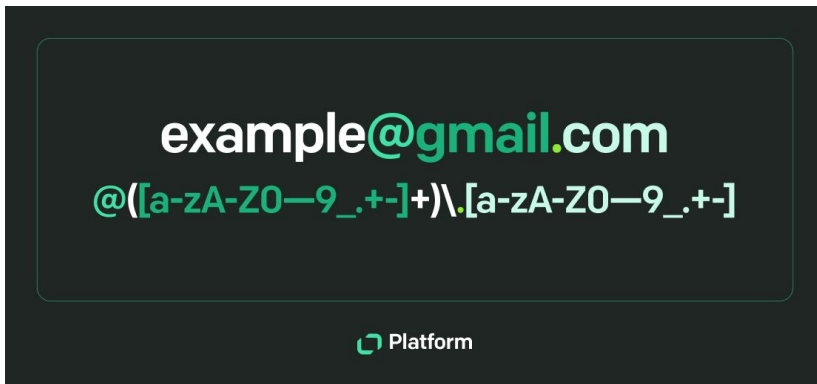
For this bonus workshop, we'll be covering:

- Fundamentals of Regular Expressions
- Its applications
- Implementations in JavaScript

What are Regular Expressions (Regex)?

Simple definition:

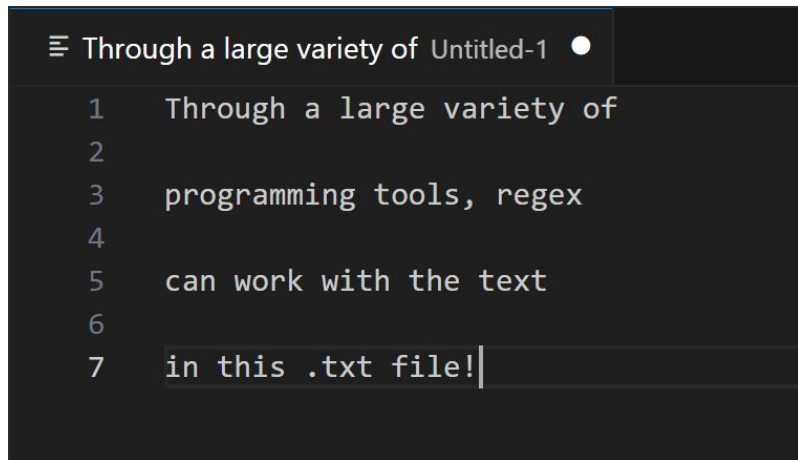
- Sequences of characters used to find and manipulate strings based on patterns



Example of regex, Text Platform

Why do we need RegEx?

- Concise and efficient way to work with text
 - Text processing is extensive in most computational fields
 - Small syntax, large impact
 - Supported by many programming tools

A screenshot of a code editor window titled 'Untitled-1'. The editor has a dark background and shows a text file with the following content:

```
1 Through a large variety of
2
3 programming tools, regex
4
5 can work with the text
6
7 in this .txt file!
```

The text 'in this .txt file!' on line 7 is highlighted with a light blue selection. The cursor is positioned at the end of this line.

Example .txt file

Applications of RegEx

- Text searching/replacing within files and strings
- Text input validation
 - Ex. emails, passwords, phone numbers
- Data extraction front text
 - Ex. web scraping



Web scraping flow chart, *CrawlNow*

The background is a solid dark red color. Overlaid on this are faint, stylized illustrations of a smartphone. One part of the phone shows a satellite dish icon, and another part shows a lightbulb icon, suggesting themes of technology, communication, and ideas.

RegEx Symbols

Symbols

These symbols are paired together to extract/match structured pieces of text.

Symbol	Description	Symbol	Description
^	Start of line +	?	0 or 1 +
\A	Start of string +	{3}	Exactly 3 +
\$	End of line +	{3,}	3 or more +
\Z	End of string +	{3,5}	3, 4 or 5 +
\b	Word boundary +	\	Escape Character +
\B	Not word boundary +	\n	New line +
\<	Start of word	\r	Carriage return +
\>	End of word	\t	Tab +
\s	White space	.	Any character except new line (\n) +
\S	Not white space	(a b)	a or b +
\d	Digit	[abc]	Range (a or b or c) +
\D	Not digit	[^abc]	Not a or b or c +
\w	Word	[0-7]	Digit between 0 and 7 +
\W	Not word	[a-q]	Letter between a and q +
*	0 or more +	[A-Q]	Upper case letter + between A and Q +
+	1 or more +		

Quantity

- $x\{p\}$ matches exactly p repetitions of x
- $x\{p, \}$ matches p or more repetitions of x
- $x\{p, q\}$ matches p to q repetitions of x (Inclusive)
- x^* matches 0 or more repetitions of x
- x^+ matches 1 or more repetitions of x

Quick Examples

$w\{3\}$ matches **www**

$w\{3, 4\}$ matches **www, wwww**

w^* matches **"", w, wwwwww** (any number of **ws**)

w^+ matches **w, wwwwww**, any number of **$w \geq 1$**

Grouped Matching

- (cat|dog) matches **cat** or **dog** vs.
[cat|dog] matches 'c', 'a', 't', '|', 'd', 'o', 'g'
- [0-9] matches any digit 0-9 **once**
- [a-zA-Z0-9] matches any alphanumeric
- [^0-9] matches any non-digit character, “^” = **not**

Quick Examples

(cat|dog){2} matches:
catcat, dogdog, catdog, dogcat

[a-zA-Z0-9]* matches:
Cs112 or any word that has
alphanumerics as well as “”

[^a-zA-Z]+ matches:
1 or more combination of digits or
special characters like **1&234\$@**
- Doesn't match ABC123

Shortcuts

- Easy encodings for common matching patterns:
 - alphanumeric:[a-zA-Z0-9]
 - digit [0-9].

For your reference



- **Extra Symbols:**
 - escape character: \
 - . matches any character so
. * would match any
sequence of characters

Shortcut	Equivalent to
<code>\d</code> <code>\d\d</code> or <code>\d{2}</code>	<code>[0-9]</code> <code>[0-9]{2}</code>
<code>\D</code>	<code>[^0-9]</code> = “NOT” digit
<code>\w</code> <code>\W</code>	<code>[a-zA-Z0-9_]</code> <code>[^a-zA-Z0-9_]</code> = “NOT” word
<code>\s</code> <code>\S</code>	Captures space characters like “ ”, tabs, new-lines, carriage returns, etc. <code>[\t\n\r\f\v]</code> <code>[^ \t\n\r\f\v]</code> = “NOT” space



Examples

Matching Rutgers emails

hpm27@scarletmail.rutgers.edu

What is **constant** in this format?

- The @ symbol
- “.rutgers.edu”

What **varies**?

- The netID, it could be any combination of letters and numbers
- “scarletmail” or could be a different domain such as “rwjms”, “cs”, etc.

Matching Rutgers emails

hpm27@scarletmail.rutgers.edu

So far we have: ____@_____.rutgers.edu

We can match a combination of letters & numbers using `[a-z0-9]+`

- Interpret this as a or b or c... or 0 or 1 or 2...
- The + indicates that we're trying to match **1 or more**

This gives us: `[a-z0-9]+@[a-z]+\.`rutgers.edu

Gene Matching with RegEx

- A genome sequence consists of the letters **A, C, T, G**.
- A potential gene is represented by a string of the form:
 - (prefix) **gene** (postfix)
 - **Prefix** = ATG
 - **Postfix** = TAG/TAA/TGA
 - **Gene** = stuff in between

We want to capture what's in between!

Gene Matching with Regex

So far we have:

ATG____(TAG|TAA|TGA)

What's wrong with this expression?

ATG.*(TAG|TAA|TGA)

- This will match the entire expression including prefix and postfix, what if we want what's in between without extra preprocessing?
- How do we do this? → **Capture Group**

- **Prefix** = ATG
- **Postfix** = TAG/TAA/TGA
- **Gene** = stuff in between

Gene Matching with Regex

- **Prefix** = ATG
- **Postfix** = TAG/TAA/TGA
- **Gene** = stuff in between

To capture what's between the prefix and postfix, we need a **capture group**!

- Surround parts of a pattern string in parentheses to indicate that we want to specifically capture that information

Final Expression:

ATG(.*)(TAG|TAA|TGA)

```
const sequence =  
"AGTATGCATTAGCAT"  
  
const regex =  
/ATG(.*)(TAG|TAA|TGA)/;  
  
const match =  
sequence.match(regex);  
  
//Out:  
// [ATGCATTAG, CAT, TAG]
```




Implementing RegEx in Code

Match a Palindrome!

Write a **regular expression** that matches strings which contain **exactly five non-whitespace characters** forming a **5-character palindrome**, while **ignoring any amount of whitespace** (spaces, tabs, newlines) between those characters and at the ends.

Examples that should match:

- `a1b1a`
- `a 1b 1a`
- `#a? a#` (with spaces anywhere)

Match a Palindrome!

Write a **regular expression** that matches strings which contain **exactly five non-whitespace characters** forming a **5-character palindrome**, while **ignoring any amount of whitespace** (spaces, tabs, newlines) between those characters and at the ends.

Examples that should match:

- a1b1a
- a 1b 1a
- #a? a# (with spaces anywhere)

```
const isPal5 = /^\\s*(\\S)\\s*(\\S)\\s*(\\S)\\s*\\2\\s*\\1\\s*$;/;  
const is5CharPalindromeIgnoringWS = s => isPal5.test(s);
```

Practice



Break into groups of
3-4 and try the next
few problems!

Question #1

- What does /go+gle/ match?

a) "gogle"

b) "google"

c) "gooogle"

d) All of the above



Question #2

- Identify all web URL's in the form:

`https://www.somesite.[com/io/ai]`

-

Question #3

Side Note:

\b = boundary tag
^...\$ are anchor tags

- **Verify all valid dates in the format DD/MM/YYYY.**
Ex: 05/10/25

Questions?

Please fill out the feedback form when you have a chance!

Next Bonus Workshop...

Postman and OpenAPI

- Friday 10/24/2025, 3:30 PM–4:30 PM
- Using backend tools, like Postman, to test your APIs
- Getting familiar with OpenAPI standard

Attendance



Please let us know where we can improve the
format of the lessons!