

# Regular Expressions Quick Reference

Patterns, quantifiers, groups, lookaheads, flags

## Basic Patterns

### Metacharacters

.	Any character (except newline)
^	Start of string / line
\$	End of string / line
*	0 or more of previous
+	1 or more of previous
?	0 or 1 of previous (optional)
\	Escape metacharacter

### Literal Matching

hello	# matches "hello" exactly
a.c	# matches "abc", "alc", "a-c", etc.
\.txt	# matches literal ".txt"

## Character Classes

### Bracket Expressions

[abc]	Match a, b, or c
[^abc]	Match anything except a, b, c
[a-z]	Lowercase letter
[A-Z]	Uppercase letter
[0-9]	Digit
[a-zA-Z0-9]	Alphanumeric

### Shorthand Classes

\d	Digit [0-9]
\D	Non-digit [^0-9]
\w	Word char [a-zA-Z0-9_]
\W	Non-word char
\s	Whitespace [ \t\n\r\f]
\S	Non-whitespace

## Quantifiers

### Greedy Quantifiers

*	0 or more (greedy)
+	1 or more (greedy)
?	0 or 1 (greedy)
{n}	Exactly n times
{n,}	n or more times
{n,m}	Between n and m times

### Lazy Quantifiers

*?	0 or more (lazy / non-greedy)
+?	1 or more (lazy)
??	0 or 1 (lazy)
{n,m}?	Between n and m (lazy)

Lazy quantifiers match as few characters as possible

### Greedy vs Lazy

<.+>	# greedy: "<b>bold</b>"
<.+?>	# lazy: "<b>"

## Anchors

^	Start of string (or line with <b>m</b> flag)
\$	End of string (or line with <b>m</b> flag)
\b	Word boundary
\B	Non-word boundary
\A	Start of string (not affected by <b>m</b> )
\Z	End of string (not affected by <b>m</b> )

## Anchor Examples

^Hello	# starts with "Hello"
world\$	# ends with "world"
\bword\b	# "word" as whole word
\Bword\B	# "word" inside another word

## Groups & Alternation

### Capturing Groups

(abc)	# capture group: match "abc"
(a b c)	# alternation: a or b or c
(cat dog)	# match "cat" or "dog"
(\d{3})-(\d{4})	# groups: "123-4567"

### Group Types

(pattern)	Capturing group
(?:pattern)	Non-capturing group
(?P<name>pat)	Named group (Python)
(?<name>pat)	Named group (JS, .NET)
\1 \2	Backreference to group 1, 2
a b	Alternation: a or b

## Lookahead & Lookbehind

(?=pattern)	Positive lookahead
(?!pattern)	Negative lookahead
(?<=pattern)	Positive lookbehind
(?<!pattern)	Negative lookbehind

## Lookaround Examples

\d+(?= USD)	# digits followed by " USD"
\d+(?! USD)	# digits NOT followed by " USD"
(?<=\\$)\d+	# digits preceded by "\$"
(?!\\$)\d+	# digits NOT preceded by "\$"

Lookarounds match a position without consuming characters

## Common Patterns

\d{1,3}(\.\d{1,3}){3}	IPv4 address (basic)
[\w.+-]+@[w-]+\.[w.]+	Email (basic)
https?://[\w./\-?&#]=+	URL (basic)
\(?d{3}\)?[-.\s]?d{3}[-.\s]?d{4}	US phone number
\d{4}-\d{2}-\d{2}	Date (YYYY-MM-DD)
#[0-9a-fA-F]{6}	Hex color code

These are simplified patterns; production use may need stricter validation

## Flags

<b>g</b>	Global: find all matches, not just first
<b>i</b>	Case-insensitive matching
<b>m</b>	Multiline: ^ / \$ match line boundaries
<b>s</b>	Dotall: . matches newline too
<b>x</b>	Verbose: ignore whitespace, allow comments
<b>u</b>	Unicode: full Unicode support

## Flag Usage by Language

/pattern/gi	# JavaScript
re.compile(r"pat", re.I   re.M)	# Python
grep -iE "pattern"	# grep (extended)