

# String manipulation with stringr : : CHEAT SHEET

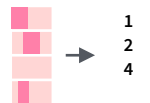


The **stringr** package provides a set of internally consistent tools for working with character strings, i.e. sequences of characters surrounded by quotation marks.

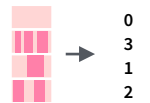
## Detect Matches



**str\_detect**(string, **pattern**) Detect the presence of a pattern match in a string. `str_detect(fruit, "a")`



**str\_which**(string, **pattern**) Find the indexes of strings that contain a pattern match. `str_which(fruit, "a")`



**str\_count**(string, **pattern**) Count the number of matches in a string. `str_count(fruit, "a")`

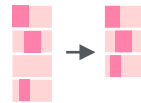


**str\_locate**(string, **pattern**) Locate the positions of pattern matches in a string. Also **str\_locate\_all**. `str_locate(fruit, "a")`

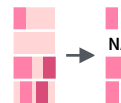
## Subset Strings



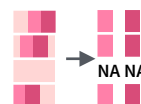
**str\_sub**(string, start = 1L, end = -1L) Extract substrings from a character vector. `str_sub(fruit, 1, 3); str_sub(fruit, -2)`



**str\_subset**(string, **pattern**) Return only the strings that contain a pattern match. `str_subset(fruit, "b")`

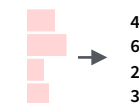


**str\_extract**(string, **pattern**) Return the first pattern match found in each string, as a vector. Also **str\_extract\_all** to return every pattern match. `str_extract(fruit, "[aeiou]")`

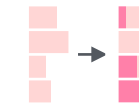


**str\_match**(string, **pattern**) Return the first pattern match found in each string, as a matrix with a column for each ( ) group in pattern. Also **str\_match\_all**. `str_match(sentences, "(a|the) ([^ ]+)")`

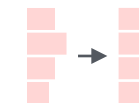
## Manage Lengths



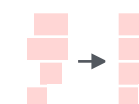
**str\_length**(string) The width of strings (i.e. number of code points, which generally equals the number of characters). `str_length(fruit)`



**str\_pad**(string, width, side = c("left", "right", "both"), pad = " ") Pad strings to constant width. `str_pad(fruit, 17)`



**str\_trunc**(string, width, side = c("right", "left", "center"), ellipsis = "...") Truncate the width of strings, replacing content with ellipsis. `str_trunc(fruit, 3)`

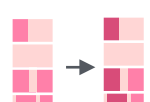


**str\_trim**(string, side = c("both", "left", "right")) Trim whitespace from the start and/or end of a string. `str_trim(fruit)`

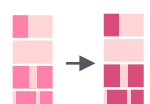
## Mutate Strings



**str\_sub()** <- value. Replace substrings by identifying the substrings with `str_sub()` and assigning into the results. `str_sub(fruit, 1, 3) <- "str"`



**str\_replace**(string, **pattern**, replacement) Replace the first matched pattern in each string. `str_replace(fruit, "a", "-")`



**str\_replace\_all**(string, **pattern**, replacement) Replace all matched patterns in each string. `str_replace_all(fruit, "a", "-")`

A STRING  
↓  
a string

**str\_to\_lower**(string, locale = "en")<sup>1</sup> Convert strings to lower case. `str_to_lower(sentences)`

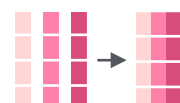
a string  
↓  
A STRING

**str\_to\_upper**(string, locale = "en")<sup>1</sup> Convert strings to upper case. `str_to_upper(sentences)`

a string  
↓  
A String

**str\_to\_title**(string, locale = "en")<sup>1</sup> Convert strings to title case. `str_to_title(sentences)`

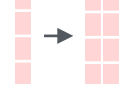
## Join and Split



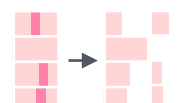
**str\_c**(..., sep = "", collapse = NULL) Join multiple strings into a single string. `str_c(letters, LETTERS)`



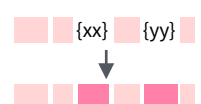
**str\_c**(..., sep = "", collapse = "") Collapse a vector of strings into a single string. `str_c(letters, collapse = "")`



**str\_dup**(string, times) Repeat strings times times. `str_dup(fruit, times = 2)`



**str\_split\_fixed**(string, **pattern**, n) Split a vector of strings into a matrix of substrings (splitting at occurrences of a pattern match). Also **str\_split** to return a list of substrings. `str_split_fixed(fruit, " ", n=2)`



**str\_glue**(..., .sep = "", .envir = parent.frame()) Create a string from strings and {expressions} to evaluate. `str_glue("Pi is {pi}")`



**str\_glue\_data**(.x, ..., .sep = "", .envir = parent.frame(), .na = "NA") Use a data frame, list, or environment to create a string from strings and {expressions} to evaluate. `str_glue_data(mtcars, "{rownames(mtcars)} has {hp} hp")`

## Order Strings



**str\_order**(x, decreasing = FALSE, na\_last = TRUE, locale = "en", numeric = FALSE, ...) <sup>1</sup> Return the vector of indexes that sorts a character vector. `x[str_order(x)]`



**str\_sort**(x, decreasing = FALSE, na\_last = TRUE, locale = "en", numeric = FALSE, ...) <sup>1</sup> Sort a character vector. `str_sort(x)`

## Helpers

apple  
banana  
pear

**str\_conv**(string, encoding) Override the encoding of a string. `str_conv(fruit, "ISO-8859-1")`

apple  
banana  
pear

**str\_view**(string, **pattern**, match = NA) View HTML rendering of first regex match in each string. `str_view(fruit, "[aeiou]")`

**str\_view\_all**(string, **pattern**, match = NA) View HTML rendering of all regex matches. `str_view_all(fruit, "[aeiou]")`

**str\_wrap**(string, width = 80, indent = 0, exdent = 0) Wrap strings into nicely formatted paragraphs. `str_wrap(sentences, 20)`

# Need to Know

Pattern arguments in stringr are interpreted as regular expressions *after any special characters have been parsed*.

In R, you write regular expressions as *strings*, sequences of characters surrounded by quotes ("" or '') or single quotes('').

Some characters cannot be represented directly in an R string. These must be represented as **special characters**, sequences of characters that have a specific meaning., e.g.

Special Character	Represents
\\	\
\"	"
\n	new line

Run ?"" to see a complete list

Because of this, whenever a \ appears in a regular expression, you must write it as \\ in the string that represents the regular expression.

Use writeLines() to see how R views your string after all special characters have been parsed.

```
writeLines("\\.")
# \.
```

```
writeLines("\\ is a backslash")
# \ is a backslash
```

## INTERPRETATION

Patterns in stringr are interpreted as regexs To change this default, wrap the pattern in one of:

**regex**(pattern, ignore\_case = FALSE, multiline = FALSE, comments = FALSE, dotall = FALSE, ...) Modifies a regex to ignore cases, match end of lines as well of end of strings, allow R comments within regex's, and/or to have . match everything including \n. str\_detect("I", regex("i", TRUE))

**fixed**() Matches raw bytes but will miss some characters that can be represented in multiple ways (fast). str\_detect("\u0130", fixed("i"))

**coll**() Matches raw bytes and will use locale specific collation rules to recognize characters that can be represented in multiple ways (slow). str\_detect("\u0130", coll("i", TRUE, locale = "tr"))

**boundary**() Matches boundaries between characters, line\_breaks, sentences, or words. str\_split(sentences, boundary("word"))

# Regular Expressions -

Regular expressions, or *regexps*, are a concise language for describing patterns in strings.

## MATCH CHARACTERS

string (type this)	regex (to mean this)	matches (which matches this)	example
	<b>a (etc.)</b>	a (etc.)	
\\.	\\. (etc.)	.	see("a")
\\!	\\!	!	see("\\.")
\\?	\\?	?	see("\\!")
\\\\	\\\\	\	see("\\\\")
\\(	\\(	(	see("\\(\\)")
\\)	\\)	)	see("\\)")
\\{	\\{	{	see("\\{\\}")
\\}	\\}	}	see("\\}")
\\n	\\n	new line (return)	see("\\n")
\\t	\\t	tab	see("\\t")
\\s	\\s	any whitespace ( <b>S</b> for non-whitespaces)	see("\\s")
\\d	\\d	any digit ( <b>D</b> for non-digits)	see("\\d")
\\w	\\w	any word character ( <b>W</b> for non-word chars)	see("\\w")
\\b	\\b	word boundaries	see("\\b")
	<b>[digit:]</b> <sup>1</sup>	digits	see("[digit:]")
	<b>[alpha:]</b> <sup>1</sup>	letters	see("[alpha:]")
	<b>[lower:]</b> <sup>1</sup>	lowercase letters	see("[lower:]")
	<b>[upper:]</b> <sup>1</sup>	uppercase letters	see("[upper:]")
	<b>[alnum:]</b> <sup>1</sup>	letters and numbers	see("[alnum:]")
	<b>[punct:]</b> <sup>1</sup>	punctuation	see("[punct:]")
	<b>[graph:]</b> <sup>1</sup>	letters, numbers, and punctuation	see("[graph:]")
	<b>[space:]</b> <sup>1</sup>	space characters (i.e. \s)	see("[space:]")
	<b>[blank:]</b> <sup>1</sup>	space and tab (but not new line)	see("[blank:]")
	.	every character except a new line	see(".")

<sup>1</sup> Many base R functions require classes to be wrapped in a second set of [ ], e.g. **[digit:]**

see <- function(rx) str\_view\_all("abc ABC 123\\t.!?\\(){}\\n", rx)

see("a")	abc ABC 123	.!?\\(){}\\n
see("\\.")	abc ABC 123	.!?\\(){}\\n
see("\\!")	abc ABC 123	.!?\\(){}\\n
see("\\\\")	abc ABC 123	.!?\\(){}\\n
see("\\(\\)")	abc ABC 123	.!?\\(){}\\n
see("\\)")	abc ABC 123	.!?\\(){}\\n
see("\\{\\}")	abc ABC 123	.!?\\(){}\\n
see("\\}")	abc ABC 123	.!?\\(){}\\n
see("\\n")	abc ABC 123	.!?\\(){}\\n
see("\\t")	abc ABC 123	.!?\\(){}\\n
see("\\s")	abc ABC 123	.!?\\(){}\\n
see("\\d")	abc ABC 123	.!?\\(){}\\n
see("\\w")	abc ABC 123	.!?\\(){}\\n
see("\\b")	abc ABC 123	.!?\\(){}\\n
see("[digit:]")	abc ABC 123	.!?\\(){}\\n
see("[alpha:]")	abc ABC 123	.!?\\(){}\\n
see("[lower:]")	abc ABC 123	.!?\\(){}\\n
see("[upper:]")	abc ABC 123	.!?\\(){}\\n
see("[alnum:]")	abc ABC 123	.!?\\(){}\\n
see("[punct:]")	abc ABC 123	.!?\\(){}\\n
see("[graph:]")	abc ABC 123	.!?\\(){}\\n
see("[space:]")	abc ABC 123	.!?\\(){}\\n
see("[blank:]")	abc ABC 123	.!?\\(){}\\n
see(".")	abc ABC 123	.!?\\(){}\\n

**[space:]**  
new line

**[blank:]**  
space  
tab

**[graph:]**

**[punct:]**

. , : ; ? ! \ | / ` = \* + - ^  
\_ ~ " ' [ ] { } ( ) < > @ # \$

**[alnum:]**

**[digit:]**

0 1 2 3 4 5 6 7 8 9

**[alpha:]**

**[lower:]**

a b c d e f  
g h i j k l  
m n o p q r  
s t u v w x  
z

**[upper:]**

A B C D E F  
G H I J K L  
M N O P Q R  
S T U V W X  
Z

## ALTERNATES

alt <- function(rx) str\_view\_all("abcde", rx)

regex	matches	example
ab d	or	alt("ab d")
[abe]	one of	alt("[abe]")
^[abe]	anything but	alt("^[abe]")
[a-c]	range	alt("[a-c]")

## ANCHORS

anchor <- function(rx) str\_view\_all("aaa", rx)

regex	matches	example
^a	start of string	anchor("^a")
a\$	end of string	anchor("a\$")

## LOOK AROUNDS

look <- function(rx) str\_view\_all("bacad", rx)

regex	matches	example
a(?=c)	followed by	look("a(?=c)")
a(?!c)	not followed by	look("a(?!c)")
(?<=b)a	preceded by	look("(?<=b)a")
(?<!b)a	not preceded by	look("(?<!b)a")

## QUANTIFIERS

quant <- function(rx) str\_view\_all("a.aa.aaa", rx)

regex	matches	example
a?	zero or one	quant("a?")
a*	zero or more	quant("a*")
a+	one or more	quant("a+")
a{n}	exactly n	quant("a{2}")
a{n,}	n or more	quant("a{2,}")
a{n,m}	between n and m	quant("a{2,4}")

## GROUPS

ref <- function(rx) str\_view\_all("abbaab", rx)

regex	matches	example
(ab d)e	sets precedence	alt("(ab d)e")

Use an escaped number to refer to and duplicate parentheses groups that occur earlier in a pattern. Refer to each group by its order of appearance

string (type this)	regex (to mean this)	matches (which matches this)	example (the result is the same as ref("abba"))
\\1	\\1 (etc.)	first () group, etc.	ref("(a)(b)\\2\\1")

