

# Capture Group References

In Wrangle transformations that support use of patterns, you may need to specify capture groups. A **capture group** is a pattern that describes a set of one or more characters that constitute a match. These matches can be programmatically referenced in replacement values.

- These patterns are described using regular expression syntax. Trifacta SaaS implements a version of regular expressions based off of *RE2* and *PCRE* regular expressions.

## Basic Capture Groups

### Example 1

<b>Transformation Name</b>	Replace text or pattern
<b>Parameter: Columns</b>	All
<b>Parameter: Find</b>	`{start}(%+) `
<b>Parameter: Replace with</b>	'First Word\: \$1'

### Elements of the matching pattern (on:):

Reference	Description
{start}	A Pattern reference to the start of the tested value.
(%+)	Matches on one or more characters of any time. <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"><b>NOTE:</b> The parentheses indicate that this set of characters is a capture group.</div>
	Last character in the matching pattern is an empty space.

**Matches:** First set of any characters in the tested value up to the first empty space (the first word), across all columns of the dataset.

**Replaced with:** The text value `First Word:` followed by a reference to the first capture group (`$1`), which returns the first word found in the tested value.

### Example 2

The previous example works fine, as long as there is a space in the tested value to identify the end of the first word. If there is one and only word in the tested value, then you must amend the `on:` parameter value with the following:

<b>Transformation Name</b>	Replace text or pattern
<b>Parameter: Columns</b>	All
<b>Parameter: Find</b>	`{start}(%+) (  {end})`
<b>Parameter: Replace with</b>	'First Word\: \$1'

In this case, the second capture group features two elements:

Reference	Description
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	first character in the second capture group is an empty space.
	Logical OR, which means that the capture group matches on either the empty space or the following value, which is a reference to the end of the tested value.
{end}	A Pattern reference to the end of the tested value.

### Example 3

<b>Transformation Name</b>	Replace text or pattern
<b>Parameter: Columns</b>	All
<b>Parameter: Find</b>	`{start}(%+) (%+)(  {end})`
<b>Parameter: Replace with</b>	'Second Word\: \$2'

**Matches:** The `on` pattern has been augmented to include the second word in the tested value, across all columns of the dataset.

**Replaced with:** The text value `Second Word`: followed by a reference to the second capture group (`$2`), which returns the second word found in the tested value.

### Dollar sign in Replace transformation

The dollar sign (\$) is used as a form of escape character in the `with` parameter of the Replace transformation. This pattern identifies the replacement string.

In the table below, you can review how these replacement patterns are supported.

Pattern	Description
\$\$	Inserts a \$ in the replacement value.
\$n or \$nn	For non-negative digits n, this pattern inserts the nth parameterized sub-match string, provided that the first argument was a regex object.

### Examples

In the following example, the `MyColumn` column contains the value `foobar` in all rows.

source value	Replace transformation	replacement								
foobar	<table border="1"> <tr> <td><b>Transformation Name</b></td> <td>Replace text or pattern</td> </tr> <tr> <td><b>Parameter: Column</b></td> <td>MyColumn</td> </tr> <tr> <td><b>Parameter: Find</b></td> <td>'f'</td> </tr> <tr> <td><b>Parameter: Replace with</b></td> <td>'\$\$f'</td> </tr> </table>	<b>Transformation Name</b>	Replace text or pattern	<b>Parameter: Column</b>	MyColumn	<b>Parameter: Find</b>	'f'	<b>Parameter: Replace with</b>	'\$\$f'	\$foobar
<b>Transformation Name</b>	Replace text or pattern									
<b>Parameter: Column</b>	MyColumn									
<b>Parameter: Find</b>	'f'									
<b>Parameter: Replace with</b>	'\$\$f'									

foobar				o
	<b>Transformation Name</b>	Replace text or pattern		
	<b>Parameter: Column</b>	MyColumn		
	<b>Parameter: Find</b>	`(f)(o)o(b)ar`		
	<b>Parameter: Replace with</b>	`\$2`		
	Note that the on parameter is a Pattern .			

## Positive and Negative Lookaheads

In regular expressions, you can use positive and negative lookahead capture groups to capture content that is conditionally followed or not followed by a specified capture group.

Type	Example expression	
Positive lookahead	<code>/q(?:u)/</code>	Capture the letter <code>q</code> only when it is followed by the letter <code>u</code> . Letter <code>u</code> is not captured.
Negative lookahead	<code>/q(?:!u)/</code>	Capture the letter <code>q</code> when it is not followed by the letter <code>u</code> . Letter <code>u</code> is not captured.