

# The l3str-format package

## Formatting strings of characters

The L<sup>A</sup>T<sub>E</sub>X Project\*

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### 1 Format specifications

In this module, we introduce the notion of a string  $\langle format \rangle$ . The syntax follows that of Python's `format` built-in function. A  $\langle format specification \rangle$  is a string of the form

$$\langle format specification \rangle = [[\langle fill \rangle]\langle alignment \rangle][\langle sign \rangle][\langle width \rangle][.\langle precision \rangle][\langle style \rangle]$$

where each [...] denotes an independent optional part.

- $\langle fill \rangle$  can be any character: it is assumed to be present whenever the second character of the  $\langle format specification \rangle$  is a valid  $\langle alignment \rangle$  character.
- $\langle alignment \rangle$  can be < (left alignment), > (right alignment), ^ (centering), or = (for numeric types only).
- $\langle sign \rangle$  is allowed for numeric types; it can be + (show a sign for positive and negative numbers), - (only put a sign for negative numbers), or a space (show a space or a -).
- $\langle width \rangle$  is the minimum number of characters of the result: if the result is naturally shorter than this  $\langle width \rangle$ , then it is padded with copies of the character  $\langle fill \rangle$ , with a position depending on the choice of  $\langle alignment \rangle$ . If the result is naturally longer, it is not truncated.
- $\langle precision \rangle$ , whose presence is indicated by a period, can have different meanings depending on the type.
- $\langle style \rangle$  is one character, which controls how the given data should be formatted. The list of allowed  $\langle styles \rangle$  depends on the type.

The choice of  $\langle alignment \rangle =$  is only valid for numeric types: in this case the padding is inserted between the sign and the rest of the number.

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## 2 Formatting various data-types

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<code>\tl_format:Nn</code>	*	<code>\tl_format:nn</code>	{ <i>token list</i> }	{ <i>format specification</i> }
<code>\tl_format:cn</code>	*	Converts the <i>token list</i> to a string according to the <i>format specification</i> . The <i>style</i> , if present, must be <i>s</i> . If <i>precision</i> is given, all characters of the string representation of the <i>token list</i> beyond the first <i>precision</i> characters are discarded.		
<code>\tl_format:nn</code>	*			

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<code>\seq_format:Nn</code>	*	<code>\seq_format:nn</code>	{ <i>sequence</i> }	{ <i>format specification</i> }
<code>\seq_format:cn</code>	*	Converts each item in the <i>sequence</i> to a string according to the <i>format specification</i> , and concatenates the results.		

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<code>\int_format:nn</code>	*	<code>\int_format:nn</code>	{ <i>intexpr</i> }	{ <i>format specification</i> }
Evaluates the <i>integer expression</i> and converts the result to a string according to the <i>format specification</i> . The <i>precision</i> argument is not allowed. The <i>style</i> can be <i>b</i> for binary output, <i>d</i> for decimal output (this is the default), <i>o</i> for octal output, <i>X</i> for hexadecimal output (using capital letters).				

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<code>\fp_format:nn</code>	*	<code>\fp_format:nn</code>	{ <i>fp expr</i> }	{ <i>format specification</i> }
Evaluates the <i>floating point expression</i> and converts the result to a string according to the <i>format specification</i> . The <i>style</i> can be				
<ul style="list-style-type: none"><li>• <i>e</i> for scientific notation, with one digit before and <i>precision</i> digits after the decimal separator, and an integer exponent, following <i>e</i>;</li><li>• <i>f</i> for a fixed point notation, with <i>precision</i> digits after the decimal separator and no exponent;</li><li>• <i>g</i> for a general format, which uses style <i>f</i> for numbers in the range <math>[10^{-4}, 10^{precision})</math> and style <i>e</i> otherwise.</li></ul>				
When there is no <i>style</i> specifier nor <i>precision</i> the number is displayed without rounding. Otherwise the <i>precision</i> defaults to 6.				

## 3 Possibilities, and things to do

- Provide a token list formatting *style* which keeps the last *precision* characters rather than the first *precision*.

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