

The l3str-format package

Formatting strings of characters

The L^AT_EX 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

<code>\tl_format:Nn</code>	<code>*</code>	<code>\tl_format:nn</code>	<code>{\langle token list \rangle}</code>	<code>{\langle format specification \rangle}</code>
<code>\tl_format:cn</code>	<code>*</code>	Converts the <code>\langle token list \rangle</code> to a string according to the <code>\langle format specification \rangle</code> . The <code>\langle style \rangle</code> , if present, must be <code>s</code> . If <code>\langle precision \rangle</code> is given, all characters of the string representation of the <code>\langle token list \rangle</code> beyond the first <code>\langle precision \rangle</code> characters are discarded.		
<code>\seq_format:Nn</code>	<code>*</code>	<code>\seq_format:nn</code>	<code>{\langle sequence \rangle}</code>	<code>{\langle format specification \rangle}</code>
<code>\seq_format:cn</code>	<code>*</code>	Converts each item in the <code>\langle sequence \rangle</code> to a string according to the <code>\langle format specification \rangle</code> , and concatenates the results.		
<code>\int_format:nn</code>	<code>*</code>	<code>\int_format:nn</code>	<code>{\langle intexpr \rangle}</code>	<code>{\langle format specification \rangle}</code>
Evaluates the <code>\langle integer expression \rangle</code> and converts the result to a string according to the <code>\langle format specification \rangle</code> . The <code>\langle precision \rangle</code> argument is not allowed. The <code>\langle style \rangle</code> can be <code>b</code> for binary output, <code>d</code> for decimal output (this is the default), <code>o</code> for octal output, <code>X</code> for hexadecimal output (using capital letters).				
<code>\fp_format:nn</code>	<code>*</code>	<code>\fp_format:nn</code>	<code>{\langle fp expr \rangle}</code>	<code>{\langle format specification \rangle}</code>
Evaluates the <code>\langle floating point expression \rangle</code> and converts the result to a string according to the <code>\langle format specification \rangle</code> . The <code>\langle style \rangle</code> can be				
<ul style="list-style-type: none">• <code>e</code> for scientific notation, with one digit before and <code>\langle precision \rangle</code> digits after the decimal separator, and an integer exponent, following <code>e</code>;• <code>f</code> for a fixed point notation, with <code>\langle precision \rangle</code> digits after the decimal separator and no exponent;• <code>g</code> for a general format, which uses style <code>f</code> for numbers in the range $[10^{-4}, 10^{\langle precision \rangle})$ and style <code>e</code> otherwise.				
When there is no <code>\langle style \rangle</code> specifier nor <code>\langle precision \rangle</code> the number is displayed without rounding. Otherwise the <code>\langle precision \rangle</code> defaults to 6.				

3 Possibilities, and things to do

- Provide a token list formatting `\langle style \rangle` which keeps the last `\langle precision \rangle` characters rather than the first `\langle precision \rangle`.

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