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The l3str-format package: formatting strings of characters

The L^AT_EX3 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>\tl_format:nn</code> $\{\langle token list \rangle\}$ $\{\langle format specification \rangle\}$
<code>\tl_format:cn</code> *	Converts the $\langle token list \rangle$ to a string according to the $\langle format specification \rangle$. The $\langle style \rangle$, if present, must be s . If $\langle precision \rangle$ is given, all characters of the string representation of the $\langle token list \rangle$ beyond the first $\langle precision \rangle$ characters are discarded.
<code>\tl_format:nn</code> *	
<code>\seq_format:Nn</code> *	<code>\seq_format:Nn</code> $\{\langle sequence \rangle\}$ $\{\langle format specification \rangle\}$
<code>\seq_format:cn</code> *	Converts each item in the $\langle sequence \rangle$ to a string according to the $\langle format specification \rangle$, and concatenates the results.
<code>\int_format:nn</code> *	<code>\int_format:nn</code> $\{\langle intexpr \rangle\}$ $\{\langle format specification \rangle\}$
	Evaluates the $\langle integer expression \rangle$ and converts the result to a string according to the $\langle format specification \rangle$. The $\langle precision \rangle$ argument is not allowed. The $\langle style \rangle$ can be b for binary output, d for decimal output (this is the default), o for octal output, X for hexadecimal output (using capital letters).
<code>\fp_format:nn</code> *	<code>\fp_format:nn</code> $\{\langle fpexpr \rangle\}$ $\{\langle format specification \rangle\}$
	Evaluates the $\langle floating point expression \rangle$ and converts the result to a string according to the $\langle format specification \rangle$. The $\langle precision \rangle$ defaults to 6. The $\langle style \rangle$ can be <ul style="list-style-type: none"> • e for scientific notation, with one digit before and $\langle precision \rangle$ digits after the decimal separator, and an integer exponent, following e; • f for a fixed point notation, with $\langle precision \rangle$ digits after the decimal separator and no exponent; • g for a general format, which uses style f for numbers in the range $[10^{-4}, 10^{\langle precision \rangle})$ and style e otherwise.

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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The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.

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