The \texttt{\LaTeX}-format package: formatting strings of characters

\texttt{\LaTeX} Project\textsuperscript{*}

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1 Format specifications

In this module, we introduce the notion of a string (format). The syntax follows that of Python’s \texttt{format} built-in function. A (format specification) is a string of the form

\[(\text{format specification}) = [[[\text{fill}]](\text{alignment})[(\text{sign})][[(\text{width})][.\text{(precision)}]][(\text{style})]]\]

where each \ldots denotes an independent optional part.

- (fill) can be any character: it is assumed to be present whenever the second character of the (format specification) is a valid (alignment) character.

- (alignment) can be < (left alignment), > (right alignment), ^ (centering), or = (for numeric types only).

- (sign) 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 -).

- (width) is the minimum number of characters of the result: if the result is naturally shorter than this (width), then it is padded with copies of the character (fill), with a position depending on the choice of (alignment). If the result is naturally longer, it is not truncated.

- (precision), whose presence is indicated by a period, can have different meanings depending on the type.

- (style) is one character, which controls how the given data should be formatted. The list of allowed (styles) depends on the type.

The choice of (alignment) = 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

\texttt{\textbackslash tl\_format:Nn} * \texttt{\textbackslash tl\_format:nn} \{(token list)\} \{(format specification)\}

Converts the \langle token list \rangle to a string according to the \langle format specification \rangle. The \langle style \rangle, if present, must be \texttt{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.

\texttt{\textbackslash seq\_format:Nn} * \texttt{\textbackslash seq\_format:cn} * \texttt{\textbackslash seq\_format:nn} *

\texttt{\textbackslash seq\_format:Nn} \{(sequence)\} \{(format specification)\}

Converts each item in the \langle sequence \rangle to a string according to the \langle format specification \rangle, and concatenates the results.

\texttt{\textbackslash int\_format:nn} *

\texttt{\textbackslash int\_format:nn} \{(intexpr)\} \{(format specification)\}

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 \texttt{b} for binary output, \texttt{d} for decimal output (this is the default), \texttt{o} for octal output, \texttt{X} for hexadecimal output (using capital letters).

\texttt{\textbackslash fp\_format:nn} *

\texttt{\textbackslash fp\_format:nn} \{(fpexpr)\} \{(format specification)\}

Evaluates the \langle floating point expression \rangle and converts the result to a string according to the \langle format specification \rangle. The \langle style \rangle can be

\begin{itemize}
  \item \texttt{e} for scientific notation, with one digit before and \langle precision \rangle digits after the decimal separator, and an integer exponent, following \texttt{e};
  \item \texttt{f} for a fixed point notation, with \langle precision \rangle digits after the decimal separator and no exponent;
  \item \texttt{g} for a general format, which uses style \texttt{f} for numbers in the range \([10^{-4}, 10^{\langle precision \rangle})\) and style \texttt{e} otherwise.
\end{itemize}

When there is no \langle style \rangle specifier nor \langle precision \rangle the number is displayed without rounding. Otherwise the \langle precision \rangle defaults to 6.

3 Possibilities, and things to do

\begin{itemize}
  \item Provide a token list formatting \langle style \rangle which keeps the last \langle precision \rangle characters rather than the first \langle precision \rangle.
\end{itemize}

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