The \texttt{l3str-format} package
Formatting strings of characters

The \LaTeX\ Project\textsuperscript{*}
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1 Format specifications

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

\begin{equation}
\langle \text{format specification} \rangle = \langle \text{fill} \rangle \langle \text{alignment} \rangle \langle \text{sign} \rangle \langle \text{width} \rangle \langle \text{precision} \rangle \langle \text{style} \rangle
\end{equation}

where each $[\ldots]$ denotes an independent optional part.

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

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

- \texttt{(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 -).

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

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

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

The choice of \texttt{(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} \star \texttt{\textbackslash tl\_format:nn \{token list\}} \{format specification\}
\begin{quote}
Converting the \texttt{token list} to a string according to the \texttt{format specification}. The \texttt{style}, if present, must be \texttt{s}. If \texttt{precision} is given, all characters of the string representation of the \texttt{token list} beyond the first \texttt{precision} characters are discarded.
\end{quote}

\texttt{\textbackslash seq\_format:nn} \star \texttt{\textbackslash seq\_format:nn \{sequence\}} \{format specification\}
\begin{quote}
Converts each item in the \texttt{sequence} to a string according to the \texttt{format specification}, and concatenates the results.
\end{quote}

\texttt{\textbackslash int\_format:nn} \star \texttt{\textbackslash int\_format:nn \{intexpr\}} \{format specification\}
\begin{quote}
Evaluates the \texttt{integer expression} and converts the result to a string according to the \texttt{format specification}. The \texttt{precision} argument is not allowed. The \texttt{style} 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).
\end{quote}

\texttt{\textbackslash fp\_format:nn} \star \texttt{\textbackslash fp\_format:nn \{fp expr\}} \{format specification\}
\begin{quote}
Evaluates the \texttt{floating point expression} and converts the result to a string according to the \texttt{format specification}. The \texttt{style} can be
\begin{itemize}
\item \texttt{e} for scientific notation, with one digit before and \texttt{precision} digits after the decimal separator, and an integer exponent, following \texttt{e};
\item \texttt{f} for a fixed point notation, with \texttt{precision} 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^{\texttt{precision}}]) and style \texttt{e} otherwise.
\end{itemize}
When there is no \texttt{style} specifier nor \texttt{precision} the number is displayed without rounding. Otherwise the \texttt{precision} defaults to 6.
\end{quote}

3 Possibilities, and things to do

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

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