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{align*}
\texttt{⟨format specification⟩} = &\ [\langle fill\rangle][\langle alignment\rangle][\langle sign\rangle][\langle width\rangle][.⟨precision⟩][\langle style\rangle]
\end{align*}

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

\begin{itemize}
\item \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.
\item \texttt{⟨alignment⟩} can be < (left alignment), > (right alignment), ^ (centering), or = (for numeric types only).
\item \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 -).
\item \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.
\item \texttt{⟨precision⟩}, whose presence is indicated by a period, can have different meanings depending on the type.
\item \texttt{⟨style⟩} is one character, which controls how the given data should be formatted. The list of allowed \texttt{⟨styles⟩} depends on the type.
\end{itemize}

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} \hspace{1em} \texttt{\textbackslash tl\_format:nn \{\textit{token list}\} \{\textit{format specification}\}}

Converts the \textit{token list} to a string according to the \textit{format specification}. The \textit{style}, if present, must be \texttt{s}. If \textit{precision} is given, all characters of the string representation of the \textit{token list} beyond the first \textit{precision} characters are discarded.

\texttt{\textbackslash seq\_format:Nn} \hspace{1em} \texttt{\textbackslash seq\_format:nn \{\textit{sequence}\} \{\textit{format specification}\}}

Converts each item in the \textit{sequence} to a string according to the \textit{format specification}, and concatenates the results.

\texttt{\textbackslash int\_format:nn} \hspace{1em} \texttt{\textbackslash int\_format:nn \{\textit{intexpr}\} \{\textit{format specification}\}}

Evaluates the \textit{integer expression} and converts the result to a string according to the \textit{format specification}. The \textit{precision} argument is not allowed. The \textit{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).

\texttt{\textbackslash fp\_format:nn} \hspace{1em} \texttt{\textbackslash fp\_format:nn \{\textit{fp expr}\} \{\textit{format specification}\}}

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

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

When there is no \textit{style} specifier nor \textit{precision} the number is displayed without rounding. Otherwise the \textit{precision} defaults to 6.

3 Possibilities, and things to do

- Provide a token list formatting \textit{style} which keeps the last \textit{precision} characters rather than the first \textit{precision}.

Index

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.

\texttt{F}

\texttt{fp commands:}

\texttt{\textbackslash fp\_format:nn} \hspace{1em} \texttt{\{\textit{format specification}\}} \hspace{1em} \texttt{2}
int commands: \int_{\text{format}}:nn \hspace{2em} \text{tl commands:} \\tl_{\text{format}}:nn \hspace{2em} \tl_{\text{format}}:nn
\seq_{\text{format}}:nn

S

3