The **enumerate** package*

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**Abstract**

This package gives the `enumerate` environment an optional argument
which determines the style in which the counter is printed.

An occurrence of one of the tokens `A` `a` `I` `i` or `1` produces the value
of the counter printed with (respectively) `\Alph\alph\Roman\roman` or
`\arabic`.

These letters may be surrounded by any strings involving any other \TeX
expressions, however the tokens `A` `a` `I` `i` `1` must be inside a `{ }` group if
they are not to be taken as special.

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1 Examples

EX i. one one one one one one one
    one one one one one one one

EX ii. two
    example a) one of two one of two
    example b) two of two

A-1 one
A-2 two

```
\begin{enumerate}[	ext{EX i.}]
  \item one one one one one one one \label{LA}
  \item two
    \begin{enumerate}[	ext{example a)}]
      \item one of two one of two \label{LB}
      \item two of two
    \end{enumerate}
\end{enumerate}

\begin{enumerate}[	ext{A}-1]
  \item one \label{LC}
  \item two
\end{enumerate}
```

\label and \ref may be used as with the standard `enumerate` environment.
\ref only produces the counter value, not the whole label. \ref prints the value

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in the same style as \item, as determined by the presence of one of the tokens A a I i 1 in the optional argument. In the above example \ref{LA}, \ref{LB} and \ref{LC} produce ‘i’, ‘iia’ and ‘I’ respectively.

2 Macros

1 (*package)
\enlab Internal token register used to build up the label command from the optional argument.
2 \newtoks\enLab

\enQmark This just expands to a ‘?’ \ref will produce this, if no counter is printed.
3 \def\enQmark{?}

The next four macros build up the command that will print the item label. They each gobble one token or group from the optional argument, and add corresponding tokens to the register \enLab. They each end with a call to \enloop, which starts the processing of the next token.

\enLabel Add the counter to the label. #2 will be one of the ‘special’ tokens A a I i 1, and is thrown away. #1 will be a command like \Roman.
4 \def\enLabel#1#2{% 5 \edef\enThe\{noexpand\#{1}\#2\} 6 \enLab\expandafter{the\enLab\csname the\@enumctr\endcsname} 7 \enloop}

\enSpace Add a space to the label. The tricky bit is to gobble the space token, as you can not do this with a macro argument.
8 \def\enSpace{\afterassignment\enSp@ce\let\@tempa= } 9 \def\enSp@ce{\enLab\expandafter{the\enLab\space}\enloop}

\enGroup Add a { } group to the label.
10 \def\enGroup#1{\enLab\expandafter{the\enLab\{#1\}}\enloop}

\enOther Add anything else to the label
11 \def\enOther#1{\enLab\expandafter{the\enLab\{#1\}}\enloop}

\enloop The body of the main loop. Eating tokens this way instead of using \@tfor lets you see spaces and all braces. \@tfor would treat a and {a} as special, but not \{a\}.
12 \def\enloop{\futurelet\@temp\enloop@}
13 \def\enloop@{% 14 \ifx A\@temp \let\@tempa{\enLabel\Alph }\else 15 \ifx a\@temp \let\@tempa{\enLabel\alph }\else 16 \ifx i\@temp \let\@tempa{\enLabel\roman }\else 17 \ifx I\@temp \let\@tempa{\enLabel\Roman }\else 18 \ifx 1\@temp \let\@tempa{\enLabel\arabic}\else 19 \ifx \@sptoken\@temp \let\@tempa{\enSpace}\else 20 \ifx \bgroup\@temp \let\@tempa{\enGroup}\else 21 \ifx \@enum\@temp \let\@tempa{\gobble}\else 22 \let\@tempa{\enOther}
Hook for possible extensions

\@enhook
\fi\fi\fi\fi\fi\fi\fi\fi
Process the current token, then look at the next.
\@tempa}

\@enhook
Hook for possible extensions. Some packages may want to extend the number of special characters that are associated with counter representations. This feature was requested to enable Russian alphabetic counting, but here I give an example of a footnote symbol counter, triggered by \*

To enable a new counter type based on a letter, you just need to add a new \ifx clause by analogy with the code above. So for example to make \* trigger footnote symbol counting, a package should do the following.

Initialise the hook, in case the package is loaded before enumerate.
\providecommand\@enhook{}

Add to the hook a new \ifx clause that associates \* with the \fnsymbol counter command.
\g@addto@macro\@enhook{%
  \ifx \*,\@entemp
  \def\@tempa{\@enLabel\fnsymbol}%
  \fi}

This code sequence should work whether it is loaded before or after this enumerate package. Any number of new counter types may be added in this way.

At this point we just need initialise the hook, taking care not to over write any definitions another package may already have added.
\providecommand\@enhook{}

\enumerate
The new enumerate environment. This is the first half of the original enumerate environment. If there is an optional argument, call \@@enum@ to define the label commands, otherwise call \@enum@ which is the second half of the original definition.
\def\enumerate{%
  \ifnum \@enumdepth >3 \@toodeep\else
  \advance\@enumdepth \@ne
  \edef\@enumctr{enum\romannumeral\the\@enumdepth}\fi
  \@@enum@{\#1}}

\@@enum@
Handle the optional argument..
\def\@@enum@[#1]{%
  \edef\@enum@{\#1}\let\@enThe\@enQmark
  The \@enum@ below is never expanded, it is used to detect the end of the token list.
  \@enloop\@enum@}
Issue a warning if we did not find one of the ‘special’ tokens.

\ifx\@enThe\@enQmark\@warning{The counter will not be printed.}\fi

Define \labelenum\textit{n} and \theenum\textit{n}.

\expandafter\edef\csname label\@enumctr\endcsname{\the\@enLab}\
\expandafter\let\csname the\@enumctr\endcsname\@enThe

Set the counter to 7 so that we get the width of ‘vii’ if roman numbering is in force then set \leftmargin\textit{n} to the width of the label plus \labelsep.

\csname c@\@enumctr\endcsname7
\expandafter\settowidth
\csname leftmargin\romannumeral\@enumdepth\endcsname
{\the\@enLab\hspace{\labelsep}}%

Finally call \@enum\ which is the second half of the original definition.

\@enum\ All the list parameters have now been defined, so call \list. This is taken straight from the original definition of \enumerate.

\def\@enum\{\list{\csname label\@enumctr\endcsname}\
{\usecounter{\@enumctr}\def\makelabel##1{\hss\llap{##1}}}\

(//package)