The tablists package*

Olga Lapko
Lapko.O@g23.relcom.ru
2009/08/04

Abstract

This package gives variant of environment for creating of list of short items in the way of tabular alignment. That could be useful for list of exercises in math educational literature. It allows to build one-level and two-level tabulated lists.

Contents

1 Building Commands 2
1.1 Spacing . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
1.2 The tabenum environment inside a proper list . . . . . . . . . . . . 4
1.3 The subtabenum environment: second level, variant I . . . . . . . . 5
1.4 The \subtabenumitem/\subitem macros: second level, variant II . 6
1.5 Placing the QED sign at the end of tabenum environment . . . . . 7
1.6 Restoring of \item as command from list environments . . . . . . 8

*This file has version number v0.0e, last revised 2009/08/04.
1 Building Commands

The \texttt{tabenum} environment prints short items aligned in columns.

Each item starts with \texttt{\tabenumitem} command. First example of \texttt{tabenum} list—please note that you may set optional argument in the same way as in modified environments from \texttt{enumerate} or \texttt{paralist} packages:

\begin{tabenum}
\item $z=\frac{xy}$;
\item $2^x=9$;
\item $3^2=4$;
\item $u=\sqrt{x^2+y^2+z^2}$;
\item $u=2^{x-3y+z}$;
\item $5^x=4$;
\item $2+5+8+\ldots+(3n+2)=155$, $n\in\mathbb{N}$;
\item $t=5u^2+8v^2$
\end{tabenum}

1) $z=\frac{x}{y}$; 2) $2^x=9$;
3) $3^{2x+3}=4$; 4) $z=2x^2+4y^2$;
5) $u=\sqrt{x^2+y^2+z^2}$; 6) $v=gt+\frac{g}{4}t$;
7) $u=2^{x-3y+z}$; 8) $w=(v+7)^2+(u-3)^2$;
9) $5^x=4$; 10) $z=(x+1)^2+y^2$;
11) $2+5+8+\ldots+(3n+2)=155$, $n\in\mathbb{N}$; 12) $t=5u^2+8v^2$;
You may see that empty line (or `\par` command), `\` command and `\cr` do the same: start a new row. The `\` macro works like in array environment and allows optional argument with vertical correction. (Also the `\*` command suppresses breaking between pages, see next example.)

Please note that two or more `\par`'s or `\cr`'s (and also any combination of these three commands) create additional empty lines.

You may use the `\item` macro instead of `\tabenumitem` in this `tabenum` environments (see next examples).

On the next step you can wish to do the list like before more compact. The `\multicolumn` does not work here correctly. At first you may use plain \TeX's command `\hidewidth` to hide width of widest column entry; then you may use other variant of `\tabenumitem` command—`\notabenumitem` command increases list entry, but does not create a new column; third command `\skipitem` allows you to skip one `tabenum` column. Next example show usage of these three commands:

```
\begin{tabenum}{\bfseries1)}\% 
\item $z=\displaystyle\frac xy$; 
\noitem $2^x=9$; 
\item $3^{2x+3}=4$ . 
\item $z=2x^2+4y^2$; \nopagebreak
\item $u=\sqrt{x^2+y^2+z^2}$; 
\item $v=gt+\displaystyle\frac g4t$, 
\item $u=2^{5x-3y+z}$.
\item $w=(v+7)^2+(u-3)^2$;
\item $5^x=\displaystyle\frac 43$ ;
\item $z=(x+1)^2+y^2$;\%\*
\item $2+5+8+ \ldots +(3n+2)=155$, 
\item $n \in \mathbb N$;\%\hidewidth\skipitem
\item $t=5u^2+8v^2$; 
\end{tabenum}
```

\footnote{Also the plain \TeX's commands like `\omit` and `\span/\multispan` commands, I think, need too complex code.}

\footnote{The `tabenum` column includes two columns: it works like `rl` columns in `tabular` environment. Thus, `\skipitem` equals to `&&` combination.}
1) \( z = \frac{x}{y} \);  
2) \( 2^t = 9; \)  
3) \( 3^{2t+3} = 4. \)  
4) \( z = 2x^2 + 4y^2; \)  
5) \( u = \sqrt{x^2 + y^2 + z^2}; \)  
6) \( v = gt + \frac{g}{4}t^2; \)  
7) \( u = 2^{5x-3y+z}; \)  
8) \( w = (v + 7)^2 + (u - 3)^2; \)  
9) \( 5^t = \frac{4}{3}; \)  
10) \( z = (x + 1)^2 + y^2; \)  
11) \( 2 + 5 + 8 + \ldots + (3n + 2) = 155, \ n \in \mathbb{N}; \)  
12) \( t = 5u^2 + 8v^2; \)

The items 1 and 2 were joined in one column: the item 2 used \texttt{\noitem{}\notabenumitem{}} command. The item 11 occupies two columns, so it uses the \texttt{\hidewidth} (hides item width) and \texttt{\skipitem} (skips column of next item) commands.

### 1.1 Spacing

Vertical spaces around tabulated list are equal to the list ones \texttt{\topsep+\partopsep}.

Space between rows depends on the \texttt{jot} value, like in amsmath environments like \texttt{align}, \texttt{gather} etc.

\texttt{\tabenumsep} The horizontal spacing between items of list. It defined like:

\begin{verbatim}
\renewcommand\tabenumsep{\hskip1em} 
\end{verbatim}

The \texttt{\labelsep} parameter is used after item number.

\texttt{\tabenumindent} The \texttt{\tabenumindent} command sets left margin of \texttt{tabenum} environment. It can be defined like horizontal space/skip or text, for example:

\begin{verbatim}
\renewcommand\tabenumindent{\hskip\parindent} 
\end{verbatim}

or

\begin{verbatim}
\renewcommand\tabenumindent{\text{Word}} 
\end{verbatim}

That could be useful also inside, e.g., a proper list environments like \texttt{enumerate} or \texttt{itemise} for corrections of left margins.

### 1.2 The \texttt{tabenum} environment inside a proper list

The version 0.0e of tablists package enlarges left margin of \texttt{tabenum}, when environment appears inside proper list, by the value of left margin of this list. Sometimes left edges of \texttt{tabenum} labels and list labels of the same level are not aligned correctly (it happens when \texttt{\labelwidth} value is not equal to the natural width of labels). In these cases you may define the correction skip with the \texttt{\tabenumindent} command.

Also the version 0.0e loads labels of empty items of upper/outer list at the left side of the first item of \texttt{tabenum} automatically. It follows mechanism similar to building of empty items in list environment. (Empty items of \texttt{LATEX} list are consecutively stored to special box register and printed out at the beginning when the list text appears; the same happens at the beginning of \texttt{tabenum} environment: this box, if not empty, is printed at the left of first \texttt{tabenum} item.)
\item \begin{tabenum}[a]
\item $z = \frac{x}{y}$; \quad b) $2^x = 9$; \quad c) $3^{2x+3} = 4$; \quad d) $z = 2x^2 + 4y^2$;
\item $u = \sqrt{x^2 + y^2 + z^2}$; \quad f) $v = gt + \frac{g}{4}t^2$; \quad g) $u = 2^{5x-3y+z}$;
\item $w = (v+7)^2 + (u-3)^2$; \quad i) $5^x = \frac{4}{3}$; \quad j) $z = (x+1)^2 + y^2$;
\item $2 + 5 + 8 + \ldots + (3n + 2) = 155, n \in \mathbb{N}$; \quad l) $t = 5u^2 + 8v^2$.
\end{tabenum}
\end{item}

Please note that for the case of \texttt{tabenum} environment inside list, there is not compatibility between version 0.0e and earlier versions—left margin of \texttt{tabenum} is changed (mechanism of placing empty list items on one baseline using compensating vertical spaces could work but its calculation was changed, see also next paragraph).

In versions until 0.0d there was offered the \texttt{\liststrut} command in the cases when needed to put empty list item on the same line with first item of \texttt{tabenum}. The command raises first line of next text block at the baseline of previous. (Without any option it puts negative baselineskip. If there is a high element (any math sentence) in the first line of next text, it must be written in option without $'$s, the height of this argument is used for compensating skips argument.) Since this command must take into account various vertical skips, which appear at the start of new item and also height of printing text, the adjusting of baselines does not always work correctly.

1.3 The \texttt{subtabenum} environment: second level, variant I

\begin{subtabenum}[a]
\item $z = \frac{xy}{x^2}$; \quad c) $3^{2x+3} = 4$.
\item $u = \sqrt{x^2 + y^2 + z^2}$; \quad f) $v = gt + \frac{g}{4}t^2$; \quad g) $u = 2^{5x-3y+z}$.
\item $w = (v+7)^2 + (u-3)^2$; \quad i) $5^x = \frac{4}{3}$; \quad j) $z = (x+1)^2 + y^2$;
\item $2 + 5 + 8 + \ldots + (3n + 2) = 155, n \in \mathbb{N}$; \quad l) $t = 5u^2 + 8v^2$.
\end{subtabenum}
\begin{tabenum}
\item a) $z = \frac{x}{y}$;  
\item b) $2^x = 9$;  
\item c) $3^{2x+3} = 4$.  
\item d) $z = 2x^2 + 4y^2$;  
\item e) $u = \sqrt{x^2+y^2+z^2}$;  
\item f) $v = gt + \frac{g}{4}t$;  
\item g) $u = 2^{5x-3y+z}$.  
\item h) $w = (v+7)^2 + (u-3)^2$;  
\item i) $5x = \frac{4}{3}$;  
\item j) $z = (x+1)^2 + y^2$;  
\item k) $2+5+8+\ldots+(3n+2) = 155$, $n \in \mathbb{N}$;  
\item l) $t = 5u^2 + 8v^2$;  
\end{tabenum}

Please note that \hidewidth skip is followed by the \strut command inside \subtabenum environment: the skips at the “edges” of tabular columns or before \ command doesn’t work.

### 1.4 The \subtabenumitem/\subitem macros: second level, variant II

The previous example shows that columns were destroyed from one \subtabenum environment to another. Also the rows of sublist cannot break between pages.

There is another variant for two-level tabulated list. If you use second option in \tabenum environment, you may use \subtabenumitem/\subitem commands for the second level.

If you put \subtabenumitem (\subitem) after \tabenumitem (\item), you get extra space between two numbers, created by \tabenumsep skip. The \negtabenumsep command cancels this skip: the version 0.0c included this command inside the \tabenumitem definition.

\begin{verbatim}
def \tabenumsep{\quad}
\begin{tabenum}[\bfseries 1)]
[\item]
[\subitem]
$z=\displaystyle\frac{xy}$;
\n
\n
$2^x=9$;
\n
$3^{2x+3}=4$.
\n
$z=2x^2+4y^2$;  
\startnumber{4}
$u=\sqrt{x^2+y^2+z^2}$;
\n
$v=gt+\frac{g}{4}t$,
\n
$u=2^{5x-3y+z}$.
\end{verbatim}

\footnote{If there are not second optional argument, these commands work like \tabenumitem/\item.}
\subitem $w=(v+7)^2+(u-3)^2$
\subitem $x=\frac{4}{3}$
\subitem $z=(x+1)^2+y^2$
\subitem $2+5+8+\ldots+(3n+2)=155$, $n\in\mathbb{N}$
\subitem $t=5u^2+8v^2$

1) a) $z=\frac{x}{y}$; b) $2^x=9$; c) $3^{2x+3}=4$; d) $z=2x^2+4y^2$
4) a) $u=\sqrt{x^2+y^2+z^2}$; b) $v=gt+\frac{g}{4}t^2$; c) $u=2^{5t-3y+z}$
   
g) $w=(v+7)^2+(u-3)^2$; h) $5^x=\frac{4}{3}$; i) $z=(x+1)^2+y^2$; j) $2+5+8+\ldots+(3n+2)=155$, $n\in\mathbb{N}$; k) $t=5u^2+8v^2$

There were used two commands \startnumber and \startsubnumber which set
next start numbers for items of each of two level\footnote{The \startnumber command can be used inside any list environment.}. The \startnumber allows you
to divide \tabenum environment and restart with necessary counter. You may still use
the traditional \setcounter{enum..}{..} combination, if you know the level of
your list and \tabenum/\subtabenum environments. For start of the new row from
\subitem, you need to use 1) the \skipitem command to skip column, occupied by
the “parent” label (\tabenumitem) and 2) the \negtabenumsep command to
undo column separation. These two commands abbreviated by \subtabrow command.

1.5 Placing the QED sign at the end of \tabenum environment

When the \tabenum environment is used inside \proof environment (the amsthm package), the better way is to put QED at the end of last \tabenum line. You may use the \tabqedhere command:

**Theorem 1.** You may put the QED sign inside the \tabenum environment.

**Proof.** Let’s put our favorite \tabenum environment inside the \proof one, and at the
end of it write the \tabqedhere (or \qedhere) command:

\begin{theorem}
You may put the QED sign inside the \env{tabenum} environment.
\end{theorem}
\begin{proof}
Let’s put...
\begin{tabenum}[[bfseries 1]]\item
\end{tabenum}
\[ t = 5u^2 + 8v^2 \]
\end{proof}

1) a) \[ z = \frac{x}{y}; \quad \text{b) } 2^x = 9; \quad \text{c) } 3^{2x+3} = 4. \quad \text{d) } z = 2x^2 + 4y^2; \]

4) a) \[ u = \sqrt{x^2 + y^2 + z^2}; \quad \text{b) } v = gt + \frac{g}{4}t^2; \quad \text{c) } u = 2^{5x-3y+z}. \]
\[ \text{d) } w = (v + 7)^2 + (u - 3)^2; \quad \text{e) } 5^x = \frac{4}{3}; \quad \text{f) } z = (x + 1)^2 + y^2; \]
\[ \text{g) } 2 + 5 + 8 + \ldots + (3n + 2) = 155, \quad n \in \mathbb{N}; \quad \text{h) } t = 5u^2 + 8v^2; \]

1.6 Restoring of \item as command from list environments

For the cases when standard lists appear inside \texttt{tablist}, you may restore original \item meaning.