lists with columns filled horizontally

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1 Preface

1.1 Motivation & History

Originally tasks has been an integral part of the ExSheets package [Nie19]. However, users
told me that it indeed could be useful to have it as a stand-alone package not having to load the
whole ExSheets beast just for having the tasks environment available. Since I agree with
this the environment has been extracted into a package if its own, tasks. Since then tasks
has been distributed as a package of its own but as part of the ExSheets bundle. With v0.10 I
decided to make it a completely independent package. So the relation to ExSheets only is a
historical one.

The reason for the tasks environment is an unwritten agreement in German maths textbooks
(exspecially in (junior) high school textbooks) to organize exercises in columns counting hori-
zontally rather than vertically. That is what tasks primarily is for. If you don’t need this feature
you’re better off using traditional \LaTeX\ lists and the enumitem package for customization.

1.2 Changes

The step to version 1.0 brought some significant changes:

- the option counter-format is deprecated. Labels can now be set quite similar to the way they are set in enumitem. This also made the enumerate option of the list template superfluous which has been removed accordingly.

- The commands \NewTasks and \RenewTasks have been renamed.

- The multiple choice lists have been removed.

- Custom definitions can be put in a \texttt{tasks.cfg} file which is automatically loaded if available.

2 License and Requirements

Permission is granted to copy, distribute and/or modify this software under the terms of the \LaTeX\ Project Public License (\LPPL), version 1.3 or later (\url{http://www.latex-project.org/lppl.txt}). The software has the status “maintained.” \texttt{TASKS} requires the \texttt{l3kernel} [L\TeX] bundle, xparse\footnote{on CTAN as xparse: \url{http://mirrors.ctan.org/macros/latex/contrib/xparse/}} and xtemplate.

3 How it works

3.1 Background

The \texttt{tasks} environment is similar to a list like enumerate but not the same. Here are some of the differences:

1. there is no pagebreak possible inside an item but only between items.

2. the enumeration default is a), b), c) …

3. the body of the \texttt{tasks} environment is split at every occurrence of the item separator. For this reason the default separator is not \texttt{item} but \texttt{task} so it is unique to this environment only. This directly leads to…

4. … the fact that the \texttt{tasks} environment cannot be nested. You can, however, use an itemize environment or another “real” list in it.

5. A fifth difference: verbatim material cannot be used in it. You’ll have to use \texttt{string}, \texttt{verbatim} or \texttt{detokenize}. If this won’t suffice then don’t use \texttt{tasks}.
The environments of \texttt{tasks} are what I like to call "pseudo-environments". This means like environments defined by the package environ [Rob14] the body of the environment is read as argument before it is processed. This is why verbatim material cannot be used in \texttt{tasks}’ lists.

### 3.2 The Basics

\begin{tasks}\[ (\langle options\rangle) (\langle num\ of\ columns\rangle) \]
List like environment where the single items are introduced with \texttt{\task}.

Let’s see an example:

\begin{verbatim}
\% \Sample is defined to contain some sample text:
\% \def\sample{This is some sample text we will use to create a somewhat longer text spanning a few lines.)
\% \def\Sample\sample \sample\par\sample
\% Some text before the list.
\begin{tasks}
\task \Sample
\task \Sample
\task \Sample
\end{tasks}
\% And also some text after it.
\end{verbatim}

Some text before the list.

\begin{enumerate}
\item This is some sample text we will use to create a somewhat longer text spanning a few lines. This is some sample text we will use to create a somewhat longer text spanning a few lines.
\item This is some sample text we will use to create a somewhat longer text spanning a few lines.
\item This is some sample text we will use to create a somewhat longer text spanning a few lines.
\end{enumerate}
Three.

How it works

And also some text after it.

The environment takes the optional argument \((\text{num of columns})\) with which the number of columns used by the environment is specified.

\begin{tasks}(2)
\task \Sample
\task \sample \sample
\task \sample
\task \Sample
\task \sample \par \sample
\end{tasks}

This is some sample text we will use to create a somewhat longer text spanning a few lines. This is some sample text we will use to create a somewhat longer text spanning a few lines.

This is some sample text we will use to create a somewhat longer text spanning a few lines.

\begin{tasks}(2)
\task This is some sample text we will use to create a somewhat longer text spanning a few lines. This is some sample text we will use to create a somewhat longer text spanning a few lines.
\task This is some sample text we will use to create a somewhat longer text spanning a few lines.
\task This is some sample text we will use to create a somewhat longer text spanning a few lines.
\end{tasks}

3.3 Items Spanning More Than One Column

Sometimes it may come in handy if an item is allowed to span more than one column. \texttt{tasks} supports items using the remaining space by adding an optional star to \texttt{\task}:
How it works

\begin{tasks}(3)
\task \text{sample}
\task* \text{sample}
\task\text* \text{sample}
\task \text{sample}
\end{tasks}

This is some sample text we will use to create a somewhat longer text spanning a few lines.

\begin{tasks}(3)
\task \text{sample} \\
\task! \text{sample} \\
\task! \text{sample} \\
\task \text{sample} \\
\end{tasks}

This is some sample text we will use to create a somewhat longer text spanning a few lines.

Tasks also supports items that span all columns in any case by adding an optional bang to \texttt{\textbackslash task}. 

\begin{tasks}(3)
\task \text{sample} \\
\task! \text{sample} \\
\task! \text{sample} \\
\task \text{sample} \\
\end{tasks}

This is some sample text we will use to create a somewhat longer text spanning a few lines.

\begin{tasks}(3)
\task \text{sample} \\
\task \text{sample} \\
\task \text{sample} \\
\end{tasks}

This is some sample text we will use to create a somewhat longer text spanning a few lines.
c) This is some sample text we will use to create a somewhat longer text spanning a few lines.

d) This is some sample text we will use to create a somewhat longer text spanning a few lines.

e) This is some sample text we will use to create a somewhat longer text spanning a few lines.

The optional star has itself an optional argument with parentheses where you can specify the number of columns the item is supposed to span:

\begin{tasks}(4)
\task the first
\task the second
\task the third
\task the fourth
\task*(3) the fifth item is way too long for this and needs three columns
\task the sixth
\task the seventh
\task*(2) the eighth item is way too long for this and needs two columns
\task the nineth
\task the tenth
\end{tasks}

If there are not enough columns left (say two columns but you said \task*(3)) the argument is ignored and the maximum number of remaining columns is used (two in case of our example). Both optional star and optional bang can be combined with the optional argument for a custom label:

\begin{tasks}(3)
\task \sample
\end{tasks}
3 How it works

\begin{tasks}(4)
\task the first
\task the second
\task the third
\task the fourth
\task \rlap{the fifth item is way too long for this so we start a new row} \startnewitemline
\task the sixth
\task the seventh
\task \rlap{the eighth item also is too long} \startnewitemline
\task the nineth
\task the tenth
\end{tasks}

Forcing a new item line manually is also possible using the following command:

\startnewitemline
Introduce a new line in a tasks environment.

While this works it also needs a bit of care since the width of the items doesn’t change which means in order to use the full width you’d have to use trickery like \rlap which then means the danger of the item text sticking into the margin.

\begin{tasks}(4)
\task* \sample
\task*{(x)} \sample
\task \sample
\task \sample
\end{tasks}
4 Available Options

The \texttt{tasks} package does not have any package options. The environment \texttt{tasks} has a number of options, though, namely the following ones that can be set using a setup command:

\begin{verbatim}
\settasks{⟨options⟩}
\end{verbatim}

\texttt{\settasks{⟨options⟩}}

Setup command for \texttt{tasks}.

\begin{itemize}
  \item \texttt{style = {⟨instance⟩}} \hspace{1cm} (initially empty)
  \begin{itemize}
    \item Choose the instance to be used. Read more on this in section 8.1.
  \end{itemize}
  \item \texttt{label-format = {⟨code⟩}} \hspace{1cm} (initially empty)
  \begin{itemize}
    \item Can be used to apply a formatting like, e.g., \texttt{\bfseries} to the labels. This may be code accepting the item as mandatory argument.
  \end{itemize}
  \item \texttt{label = {⟨code⟩}} \hspace{1cm} \texttt{Default: \texttt{\alph*}}
  \begin{itemize}
    \item Sets a custom label. The \texttt{*} is replaced by \texttt{⟨task⟩}. This is heavily inspired by enumitem's \cite{Bez19} \texttt{label} option.
  \end{itemize}
  \item \texttt{label-width = {⟨dim⟩}} \hspace{1cm} \texttt{Default: 1em}
  \begin{itemize}
    \item Sets the width of the item labels.
  \end{itemize}
  \item \texttt{label-offset = {⟨dim⟩}} \hspace{1cm} \texttt{Default: .3333em}
  \begin{itemize}
    \item Sets the offset, i.e., the distance between label and item.
  \end{itemize}
  \item \texttt{item-format = {⟨code⟩}} \hspace{1cm} (initially empty)
  \begin{itemize}
    \item Can be used to apply a formatting like, e.g., \texttt{\bfseries} to the items. This may be code accepting the item as mandatory argument.
  \end{itemize}
  \item \texttt{item-indent = {⟨dim⟩}} \hspace{1cm} \texttt{Default: 2.5em}
  \begin{itemize}
    \item The indent of an item, i.e., the horizontal space available for both label and label-offset. If
      \begin{equation}
      \text{indent} = \text{label-width} + \text{label-offset}
      \end{equation}
      the label will align with the textblock above (if \texttt{label-align = {left}} is set). Please see figure 1 for a sketch of the available lengths and how they are set.
  \end{itemize}
\end{itemize}

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a) the first  b) the second  c) the third  d) the fourth

\begin{itemize}
  \item e) the fifth item is way too long for this so we start a new row
  \item f) the sixth  g) the seventh  h) the eighth item also is too long
  \item i) the nineth  j) the tenth
\end{itemize}
## Available Options

![Diagram](image)

**Figure 1:** A visual representation of the used lengths.

<table>
<thead>
<tr>
<th>Option</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>column-sep</code></td>
<td><code>{⟨dim⟩}</code></td>
</tr>
<tr>
<td><code>label-align</code></td>
<td>left</td>
</tr>
<tr>
<td><code>before-skip</code></td>
<td><code>{⟨skip⟩}</code></td>
</tr>
<tr>
<td><code>after-skip</code></td>
<td><code>{⟨skip⟩}</code></td>
</tr>
<tr>
<td><code>after-item-skip</code></td>
<td><code>{⟨skip⟩}</code></td>
</tr>
<tr>
<td><code>resume</code></td>
<td>true</td>
</tr>
<tr>
<td><code>start</code></td>
<td><code>{⟨integer⟩}</code></td>
</tr>
<tr>
<td><code>counter</code></td>
<td><code>{⟨counter⟩}</code></td>
</tr>
<tr>
<td><code>debug</code></td>
<td>true</td>
</tr>
</tbody>
</table>

- **column-sep** = `{⟨dim⟩}`
  
  A horizontal length that is inserted between columns of items.

- **label-align** = left|right|center
  
  Determines how the labels are aligned within the label-box whose width is set with `label-width`.

- **before-skip** = `{⟨skip⟩}`
  
  Sets the skip before the list.

- **after-skip** = `{⟨skip⟩}`
  
  Sets the skip after the list.

- **after-item-skip** = `{⟨skip⟩}`
  
  This vertical skip is inserted between rows of items.

- **resume** = true|false
  
  The enumeration will resume from a previous tasks environment. In order to use this option properly you shouldn’t mix different tasks environments that both count their items.

- **start** = `{⟨integer⟩}`
  
  Set the starting value with which the list starts counting.

- **counter** = `{⟨counter⟩}`
  
  The counter to be used to count the items.

- **debug** = true|false
  
  If set to true \fboxsep is set to 0pt inside the tasks environment and \fbox is used to draw a frame around the label boxes and the item boxes.

Now the same list as above but with three columns and a different label:

```latex
\begin{tasks}[label=(\roman*),label-width=4ex](2)
\task \Sample
\task \Sample \sample
\task \Sample
\task \sample \sample
\task \Sample
\task \Sample\par\sample
\end{tasks}
```

---

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4 Available Options

(i) This is some sample text we will use (ii) to create a somewhat longer text spanning a few lines. This is some sample text we will use to create a somewhat longer text spanning a few lines.

This is some sample text we will use to create a somewhat longer text spanning a few lines.

(iii) This is some sample text we will use (iv) to create a somewhat longer text spanning a few lines.

This is some sample text we will use to create a somewhat longer text spanning a few lines.

(v) This is some sample text we will use to create a somewhat longer text spanning a few lines.

This is some sample text we will use to create a somewhat longer text spanning a few lines.

Let’s use it inside a question, i.e., inside xsim’s exercise environment [Nie20]:

\begin{exercise}
I have these two tasks for you. Shall we begin?
\begin{tasks}(2)
\task The first task: easy!
\task The second task: even more so!
\end{tasks}
\end{exercise}
Exercise 1

I have these two tasks for you. Shall we begin?

1.1 The first task: easy! 1.2 The second task: even more so!

Solution 1

Now, let’s see... ah, yes:

1.1 This is the first solution. Told you it was easy.

1.2 This is the second solution. And of course you knew that!

Finally let’s see what the debug option does (you could see it already on page 6):

5 Available Instances

There are currently three additional instances for the tasks object available:

itemize uses \labelitemi as labels.
6 Custom Labels

enumerate enumerates the items with 1., 2., ...

\begin{tasks}[style=itemize](2)
\task that's just how\ldots
\task \ldots we expected
\end{tasks}

\begin{tasks}[style=enumerate](2)
\task that's just how\ldots
\task \ldots we expected
\end{tasks}

- that's just how...
- \ldots we expected
1. that's just how...
2. \ldots we expected

6 Custom Labels

If you want to change a single label inside a list, you can use the optional argument of \texttt{task}. This will temporarily overwrite the default label.

\begin{tasks}[style=itemize] a standard item
\task another one
\task[+] a different one
\task and another one
\end{tasks}

\begin{tasks}[style=enumerate] a standard item
\task another one
\task[+] a different one
\task and another one
\end{tasks}

\texttt{tasksifmeasuringTF{(true)}{(false)}}

This command used inside a label checks if the label is typeset for measuring its width or if it is typeset “for real”. Might be useful sometimes. There are also the variants \texttt{tasksifmeasuringT} and \texttt{tasksifmeasuringF}.

7 New tasks-like Environments

It is possible to add custom environments that work like the tasks environment.

\texttt{NewTasksEnvironment[(options)]{(name)}{(separator)}{(cols)}}

Define environment \texttt{name} that uses \texttt{separator} to introduce a new item. Default for \texttt{separator} is \texttt{task}, default for \texttt{cols} is 1. The \texttt{options} are the ones described in section 4.

\texttt{RenewTasksEnvironment[(options)]{(name)}{(separator)}{(cols)}}

Renew environment previously defined with \texttt{NewTasksEnvironment}.
The tasks environment is defined as follows:

```
\NewTasksEnvironment{tasks}
```

The separator does not have to be a control sequence:

```
% preamble:
% \usepackage{fontawesome}
\NewTasksEnvironment[\label=\faThumbsOUp,\label-width=15pt]{done}[\ast]
\begin{done}
  * First task
  * Second task
\end{done}
```

Although this might seem handy or even nice I strongly advice against using something different than a command sequence. Remember that the items will be split at every occurrence of the separator. So in order to use the separator (here for example for a starred variant of a command) within an item it has to be hidden in braces. This is avoided of you use a command sequence which even doesn’t have to be defined.

Please also keep in mind that the separator still has an optional star argument (see 4), an optional bang argument and the standard optional argument. Using * will prevent the optional star argument.

```
% preamble:
% \usepackage{fontawesome}
\NewTasksEnvironment[\label=\faThumbsOUp,\label-width=15pt]{done}[\ast]
\begin{done}(3)
  * First task
  * Second task
  *! Third task spanning the full width available
  * Fourth task
\end{done}
```

```


```
8 Styling \texttt{TASKS}

\texttt{TASKS} uses xtemplate to declare additional instances for the lists.

8.1 The \texttt{tasks} Object

The object that’s defined by \texttt{TASKS} is the ‘tasks’ object. This time there are four instances available for the one template (again ‘default’) that was defined.

8.1.1 Available Options

This section only lists the options that can be used when defining an instance of the ‘default’ template. The following subsections will give some examples of their usage.

\begin{verbatim}
\DeclareTemplateInterface{tasks}{default}{3}{
  % option : type = default
  label : tokenlist = \alph*) ,
  indent : length = 2.5em ,
  label-format : tokenlist ,
  label-width : length = 1em ,
  label-offset : length = .3333em ,
  after-item-skip : skip = 1ex plus 1ex minus 1ex
}
\end{verbatim}

8.1.2 Predefined Instances

This is rather brief this time:

\begin{verbatim}
% alphabetize: a) b) c)
\DeclareInstance{tasks}{alphabetize}{default}{}
% itemize
\DeclareInstance{tasks}{itemize}{default}{
  label-width = 1.125em ,
  label = \labelitemi
}
% enumerate:
\DeclareInstance{tasks}{enumerate}{default}{
  label = \arabic*. }
\end{verbatim}
9 References

url: https://ctan.org/pkg/enumitem.

[L3P] The \LaTeX\ Project Team. *I\kern-.1667emkern-.125eml2\kern-.125emkern-.1667emkernel*. Sept. 19, 2019.
url: https://www.ctan.org/pkg/l3kernel/.

url: https://ctan.org/pkg/exsheets.

url: https://ctan.org/pkg/xsim.

url: https://ctan.org/pkg/environ.

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