The schl package*

Tassos Tsesmetzis

ttsesmetzis@gmail.com

November, 2019

Abstract

schl is a XeLaTeX package that provides commands and environments suitable for document types that appear in a classroom enviromnent. It's development is based on the Greek educational practice, but it may be usefull in other contexts also.

1 Introduction

Worksheets and tests are common document types in a classroom. schl package comes with macros that facilitate the creation of these documents. It has list environments for questions, exercises and tasks. Other environments of the package can be used for tickable or multiple choice answers. There are also commands for typesetting solutions, hints and answers to exercises.

Furthermore, you can set the name of the teacher, subject, grade, headmaster, school, date, school year and use these to print school's logo or information about an exam. schl has commands to typeset headers for each document type, a macro for typing the points of an exercise and two commands for blank space. There is also a macro for typesetting a wish for good luck!

schl is based on the Greek school practice. It redefines in Greek the common math macros \sin, \cos, \tan, \cot and \gcd. Also, it provides the math operator \lcm for the least common multiple of integers. A characteristic of Greek school mathematics, is that \lim operator appears in display mode. schl offers a macro for this.

By default, schl prints all macros that accept text as undefined. As of this version (v1.0), Greek is the only supported language. You can set it with the option greek. Other languages can be supported by redefining package's internal macros.

schl loads the packages fontspec, enumitem, mdframed and amsmath. It is written for XeLaTeX, but can be used by any system that supports fontspec.

*This document corresponds to schl v1.0, dated 2019/11/07.

2 Macros

2.1 Mathematics

The option `grmath` provides common mathematics operators in Greek. Specifically redefines in Greek the trigonometric operators `\sin`, `\cos`, `\tan`, `\cot`, `\arcsin`, `\arccos`, `\arctan`, `\cot`, `\sec`, `\csc`, `\arccot`, `\arcsec` and `\arccsc`. Also, provides the arithmetic operators `\gcd` and `\lcm` for greatest common divisor and least common multiple .

`\limdisplay` Command `\limdisplay {⟨text⟩}` prints ⟨*text*⟩ under `\lim`.

2.2 Blank space

`\lowerdots` `\blankspace` Usually, we need to designate blank space in a document. `schl` package has two commands for this. The first one `\lowerdots [⟨length⟩]{⟨number⟩}`, prints ⟨*number*⟩ dots. Optional argument ⟨*length*⟩ sets the deviation from base line. It's default value is `-0.3ex`.

```
\newcommand\lowerdots[2][-0.3ex]{%
  \begingroup
  \lccode`m=`.\relax
  \raisebox{#1}{\lowercase\expandafter{\romannumeral\number\number#2 000}}%
  \endgroup
}
```

`\blankspace [⟨length⟩]{⟨linelength⟩}` prints a line with length ⟨*linelength*⟩. The optional argument is the deviation from the base line and it's default value is `-0.3ex`. `\schl@rulethickness` is the default thickness for all `\blankspace` lines.

```
\newcommand\blankspace[2][-0.3ex]{%
 \raisebox{#1}{\rule{#2}{\schl@rulethickness}}
}
```

2.3 Lists

`schl` package defines seven types of lists. These are `question`, `exercise`, `schltask`, `multichoice`, `tickchoice`, `truefalse` and `matchique`. `tickchoice` comes also with a stared version `tickchoice*`. All of them depend on the package `enumitem`.

`question` `exercise` `schltask` These environments are `enumerate`-like lists. List's `\item` is of the form ⟨*type*⟩ ⟨*counter*⟩, where type is `\question@term` for `question`, `\exercise@term` for `exercise` and `\task@term` for `schltask`. ⟨*counter*⟩ is the internal counter of the environment.

```
\newlist{question}{enumerate}{1}
\setlist*[question]{%
  align=left,
  label=\normalsize\bf \question@term\  \arabic*.,
  wide,
  leftmargin=0pt,
  labelindent=0pt
}
```

```
\newlist{exercise}{enumerate}{1}
\setlist*[exercise]{%
  align=left,
  label=\normalsize\bf\exercise@term\  \arabic*.,
  wide,
  leftmargin=0pt,
  labelindent=0pt
}
\newlist{schltask}{enumerate}{1}
\setlist*[schltask]{%
  align=left,
  label=\normalsize\bf\letterspace{\defaultletterspace}\task@term\  \Alph*,
  wide,
  leftmargin=0pt,
  labelindent=0pt
}
```

`\letterspace` The macro `\letterspace{`⟨*number*⟩`}` is used to set the horizontal space of adjacent characters in a word. It is based on the `\addfontfeature` macro from the package `fontspec`. The argument ⟨*number*⟩ is a percentage of the font size. In `schl` package is used to set the space between capital word letters.

```
\def\letterspace#1{\addfontfeature{LetterSpace=#1}}
```

`multichoice` The `multichoice` environment is used to typeset multiple choice answers.

```
\newlist{multichoice}{enumerate*}{1}
\setlist*[multichoice]{
  labelindent=\parindent,
  label=\Alph*.,
  itemjoin=\hspace{\fill},
  before=\hspace{\fill},
  after=\hspace{\fill}
}
```

`tickchoice` `tickchoice*` The environments `tickchoice` and `tickchoice*` are variants of the `itemize` list. For both cases, each item is preceded by a square. `tickchoice` stacks items vertically,

```
\newlist{tickchoice}{itemize}{1}
\setlist[tickchoice]{labelindent=\parindent,label={\large$\square$}}
```

while `tickchoice*` stacks them horizontally.

```
\newlist{tickchoice*}{itemize*}{1}
\setlist*[tickchoice*]{
  labelindent=\parindent,
  label={\large$\square$},
  itemjoin=\hspace{\fill},
  before=\hspace{\fill},
  after=\hspace{\fill}
}
```

`truefalse` `truefalse` is a variant of the `enumerate` environment. Each `\item` is divided in two parts. The first part is the text that follows the `\item` macro. The second part is a `\parbox` that prints `\trueabbr@term` and `\falseabbr@term`.

```
\newlist{truefalse}{enumerate}{1}
\setlist[truefalse]{label={\bf \arabic*.},%
  before*={%
    \let\defaultitem\item%      Save the standard definition of \item in a macro.
    \toggletrue{first}%                 Set the first toggle with initial value true.
    \def\item{%
      \iftoggle{first}{%
        \togglefalse{first}%              Set the first toggle to take the value false.
        \defaultitem\begin{minipage}[t]{0.8\linewidth minus \truefalselength}%
        }{%
        \end{minipage}\hfill\truefalselabel\defaultitem%
        \begin{minipage}[t]{0.8\linewidth minus \truefalselength}%
        }
      }% new, temporary defition of \item
    },
    after*={%   This takes care of adding the fill for the final item on
      %         the list and just makes sure that \item is reset to its standard definition
    \end{minipage}\hfill\truefalselabel% fill for final item in list
    \let\item\defaultitem% restore standard definition of \item
  }%
}
```

`matchingque` The macro `\matchingque{`$\langle CSV \rangle$`}{`$\langle CSV \rangle$`}` is used to typeset matching questions. $\langle CSV \rangle$ are comma separated values. The $\langle CSV \rangle$s of the first argument are the parts of the matching questions that will be print in the left column. Similarly, the $\langle CSV \rangle$ of the second argument are going to be printed on the right column of the matching questions.

```
\newcommand\matchingque[3][300pt]{%
  \begin{center}
    \parbox[c]{#1}{
      \parbox[c]{\leftmatchwidth}{%
        \begin{leftmatching}
          \@for\tmp:=#2%
          \do{%
          \item \tmp
          }
        \end{leftmatching}
      }\hfill%
      \parbox[c]{\rightmatchwidth}{%
        \begin{rightmatching}
          \@for\tmp:=#3%
          \do{%
          \item \tmp
          }
        \end{rightmatching}
      }
    }
  \end{center}
}
```

`leftmatching` `rightmatching` Environments `leftmatching` and `rightmatching` are used to typeset each column

in \matchingque.

```
\newlist{leftmatching}{enumerate}{1}
\newlist{rightmatching}{enumerate}{1}
\setlist*[leftmatching]{label=\bf\Alph*.}
\setlist*[rightmatching]{label=\bf\arabic*.}
```

2.4 Answers, solutions and hints

\answer Macro \answer{⟨*text*⟩} prints (\answerabbr@term \meta{text}) at the right end of the current line.

```
\newcommand\answer[1]{%
  \hfill{\footnotesize (\answerabbr@term: #1)}
}
```

\solution Macro \solution{⟨*text*⟩} is used to typeset the solution of an exercise.

```
\newcommand\solution[1]{%
  \par\noindent\phantom{.}\hfill\textbf{\solution@term}\hfill\phantom{.}\par%
  \noindent #1
}
```

\hint schl provides the macro \hint{⟨*text*⟩} for typesetting exercise hints.

```
\newcommand\hint[1]{%
  \par{\scriptsize\noindent\textbf{\hint@term:} #1}%
}
```

\deadline A feature of homework assignments is a deadline date. \deadline{⟨*date*⟩} prints \deadline@term followed by argument ⟨*date*⟩.

```
\newcommand\deadline[1]{%
  \noindent{{\bf\normalsize\deadline@term}: #1}
}
```

2.5 Titles and headers

\heading Common document types in a school environment are the worksheet, various tests and final written exams. The macro \heading{⟨*text*⟩} gives a generic header for all these documents.

```
\newcommand\heading[1]{%
  \begin{center}
    {\bf\large #1}
  \end{center}
}
```

\worksheettitle Macro \worksheettitle{⟨*text*⟩} sets the title of a worksheet. It appends ⟨*text*⟩ to \worksheet@term.

```
\newcommand\worksheettitle[1]{%
  \heading{\worksheet@term\  #1}
}
```

\examtitle `\examtitle[⟨text⟩]{⟨text⟩}` is used to set the title of tests. The optional argument has the default value `\termtest@term`.

```
\newcommand\examtitle[2][\termtest@term]{%
  \heading{#1 #2}
}
```

\finalexamheader Titles for end year exams have a standardized form in Greek schools. `\exams@term` is followed by information about the exam. Then comes `\period@term` with the exam period after it. `\finalexamheader{⟨info⟩}{⟨period⟩}` is used for these cases.

```
\newcommand\finalexamheader[2]{%
  \heading{\letterspace{\defaultletterspace} #1 \exams@term\\[0.5ex] \period@term\  #2}
}
```

\schl@framedbox `\schl@framedbox{⟨text⟩}` prints ⟨*text*⟩ in a centered frame box. It is used by `\theorypart` and `\exercisepart`.

```
\newcommand\schl@framedbox[1]{%
  \begin{center}
    \fbox{\large{\bf\letterspace{\defaultletterspace} #1} }%
  \end{center}
}
```

\theorypart \exercisepart Sometimes theory and exercise sections constitute a written test. Macros `\theorypart` and `\exercisepart` print headers for those parts.

```
\newcommand\theorypart{%
  \schl@framedbox{\theoryheader@term\!}
}
```

and

```
\newcommand\exercisepart{%
  \schl@framedbox{\exerciseheader@term\!}
}
```

2.6 School information

\school \headmaster \teacher \subject \grade \schoolyear \schldate \examtime The macros `\school{⟨text⟩}`, `\headmaster{⟨name⟩}`, `\teacher{⟨name⟩}`, `\subject{⟨text⟩}`, `\grade{⟨text⟩}`, `\schoolyear{⟨year⟩}`, `\schldate{⟨date⟩}` and `\examtime{⟨time⟩}` define and set the value of internal macros.

```
\newcommand\school[1]{\def\schl@school{#1}}
\newcommand\headmaster[1]{\def\schl@headmaster{#1}}
\newcommand\teacher[1]{\def\schl@teacher{#1}}
\newcommand\subject[1]{\def\schl@subject{#1}}
\newcommand\grade[1]{\def\schl@grade{#1}}
\newcommand\schoolyear[1]{\def\schl@schoolyear{#1}}
\newcommand\schldate[1]{\def\schl@schldate{#1}}
\newcommand\examtime[1]{\def\schl@examtime{#1}}
```

\authorityi \authorityii \authorityiii In a similar vein, `\authorityi{⟨text⟩}`, `\authorityii{⟨text⟩}` and `\authorityiii{⟨text⟩}` define the internal macros `\schl@authorityi`, `\schl@authorityii` and `\schl@authorityiii`.

```
\newcommand\authorityi[1]{\def\schl@authorityi{#1}}
\newcommand\authorityii[1]{\def\schl@authorityii{#1}}
\newcommand\authorityiii[1]{\def\schl@authorityiii{#1}}
```

2.7 Other macros for tests

\points `\points[⟨macro⟩]{⟨number⟩}` is used to designate the points of an exercise. `{⟨number⟩}` is the number of points for the current exercise, while `[⟨macro⟩]` can be used to control the space just before the points.

```
\newcommand{\points}[2][\hfill]{%
#1(\textbf{\footnotesize \points@term{#2}\  #2})
}
```

\fullname `\fullname{⟨text⟩}` prints `\fullname@term` followed by ⟨*text*⟩.

```
\newcommand\fullname[1]{%
  \noindent{\normalsize\fullname@term :} #1
}
```

\datefield Similarly, `\datefield{⟨text⟩}` prints `\date@term` with ⟨*text*⟩ after it.

```
\newcommand\datefield[1][0]{%
  \noindent{\normalsize\date@term :}
}
```

\schoollogo `\schoollogo{⟨width⟩}` prints `\schl@school`, `\schl@grade`, `\schl@subject` and `\schl@teacher`. ⟨*width*⟩ is the length of the `\parbox`.

```
\def\schoollogo#1{%
  \parbox[t]{#1}{%
    \schl@school\\%
    \schl@grade\\%
    \schl@subject\\%
    \schl@teacher
  }
}
```

\authoritylogo `\authoritylogo[⟨number⟩]` prints `\sch@authorityi`, `\sch@authorityii`, `\sch@authorityiii` and `\schl@school`. Argument ⟨*number*⟩ is a multiplier for `\baselineskip`. This spaces is added above macro.

```
\newcommand\authoritylogo[1][1.5]{%
  \noindent\parbox[t][\height]{0.4\textwidth}{%
    \centering%

    \vspace{#1\baselineskip}

    {\schl@authorityi}

    \vspace{3\lineskip}

    {\footnotesize\schl@authorityii}

    \vspace{2\lineskip}

    {\footnotesize\schl@authorityiii}

    \vspace{3\lineskip}

```

```
    {\small\letterspace{\defaultletterspace}\MakeUppercase{\schl@school}}
  }
}
```

\examdetails
\examdetailsii

Written exam documents contain information about the period of the exam, subject, grade, writer of the test, supervisors of the exam and date. schl package has the macros \examdetails{⟨*text*⟩} and \examdetailsii for printing this information. Argument ⟨*text*⟩ of \examdetails is the exam period.

```
\newcommand\examdetails[2][3pt]{%
  \parbox[t]{#2}{
    \begin{mdframed}[linewidth=#1]
      \normalsize%
      {%
        \bf\letterspace{\defaultletterspace}%
        \schoolyearabbr@term:\hspace{3pt}\schl@schoolyear
      }\\[1.0ex]
      \textbf{\grade@term:}\hspace{3pt}\schl@grade\\[1.0ex]
        \textbf{\subject@term:}\hspace{3pt}\schl@subject \\[1.0ex]
        \textbf{\testwriter@term:}\hspace{3pt}\schl@teacher\\[1.0ex]
        \textbf{\testsupervisor@term:}\\[1.0ex]
        \textbf{\date@term:}\hspace{3pt}\schl@schldate
    \end{mdframed}
  }
}
```

and

```
\newcommand\examdetailsii{%
  \parbox[t]{0.53\linewidth}{%
    \begin{center}%
      \underline{\bf\letterspace{\defaultletterspace}\schoolyear@term\  \schl@schoolyear}%
    \end{center}
    \begin{tabular}{|r|c|r|c|}
      \hline
      {\bf\letterspace{\defaultletterspace}\lastname@term:} & \multicolumn{3}{|c|}{} \\
      \hline
      {\bf\letterspace{\defaultletterspace}\name@term:} & \multicolumn{3}{|c|}{} \\
      \hline
      {\bf\letterspace{\defaultletterspace}\examnoabbr@term:} & %
                      & {\bf\letterspace{\defaultletterspace}\MakeUppercase{\grade@term}:}
                      & \schl@grade \\
      \hline
      {\bf\letterspace{\defaultletterspace}\MakeUppercase{\subject@term}:} %
                      & \multicolumn{3}{|c|}{\schl@subject} \\
      \hline
      {\bf\letterspace{\defaultletterspace}\MakeUppercase{\date@term}:} & \schl@schldate
                      & {\bf\letterspace{\defaultletterspace}\time@term:} %
                      & \schl@examtime\\
      \hline
    \end{tabular}
  }
```

```
}
```

`\signatures` Some types of written tests end with the names of the headmaster and the teacher(s) followed by handwritten signatures. `\signatures[`⟨*role*⟩`]{`⟨*signer(s)*⟩`}` prints the name(s) of the ⟨*signer(s)*⟩ under a line with the ⟨*role*⟩ of the signer(s). `\signatureslength` is the length of the `\signatures` block.

```
\newcommand\signatures[2][\headmaster@term]{%
  \parbox[t]{\signatureslength}{%
    \setlength \baselineskip{\signaturelineskip}
    \begin{center}
      #1 \\ #2
    \end{center}
  }
}
```

`\wish` `\wish` prints `\schl@wish`, a default wish for tests.

```
\newcommand\wish[1][\schl@wish]{%
  \begin{center}
      {\LARGE\bf #1}
  \end{center}
}
```