The schl package*

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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 school system, but it may be usefull in other contexts as well.

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. Another 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 in Greek but this can be changed to any other language. This can be done by redifining 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 v0.1, dated 2019/06/15.

2 Macros

2.1 Mathematics

\sin
\cos
\tan
\cot

These macros redefine in Greek the corresponding trigonometric operators `\sin`, `\cos`, `\tan` and `\cot`.

```
\renewcommand{\sin}{\mathop{%
    \mathgroup\symgroperators \eta\mu}\nolimits}
\renewcommand{\cos}{\mathop{%
    \mathgroup\symgroperators \sigma\upsilon\nu}\nolimits}
\renewcommand{\tan}{\mathop{%
    \mathgroup\symgroperators \varepsilon\phi}\nolimits}
\renewcommand{\cot}{\mathop{%
    \mathgroup\symgroperators \sigma\phi}\nolimits}
```

`groperators` is the font used to typeset the functions.

\gcd
\lcm

`\gcd` and `\lcm` provide the arithmetic operators for greatest common devisor and least common multiple in Greek. `\gcd` is redefined as

```
 \renewcommand{\gcd}{\mathop{%
   \mathgroup\symgroperators MKΔ}\nolimits}
```

On the other hand, for `\lcm` we have

```
\DeclareMathOperator{\lcm}{ΕΚΠ}
```

\limdisplay

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

```
\newcommand{\limdisplay}[1]{\displaystyle\lim_{#1}}
```

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 six types of lists. These are question, exercise, schltask, multichoice, tickchoice and truefalse. 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.

```
\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{⟨*CSV*⟩}{⟨*CSV*⟩} is used to typeset matching questions. ⟨*CSV*⟩ are comma separated values. The ⟨*CSV*⟩s of the first argument are the parts of the matching questions that will be print in the left column. Similarly, the ⟨*CSV*⟩ 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{⟨path⟩}` prints `\sch@authorityi, \sch@authorityii, \sch@authorityiii` and `\schl@school`. Argument ⟨*path*⟩ is a path to a picture.

```
\newcommand\authoritylogo[1]{%
  \noindent\parbox[t]{40ex}{%
    \centering%
    \includegraphics{#1}

    \vspace{\lineskip}

    {\bf\letterspace{\defaultletterspace}\schl@authorityi}

    \vspace{3\lineskip}

    {\footnotesize\letterspace{\defaultletterspace}\schl@authorityii}

    \vspace{2\lineskip}

    {\footnotesize\letterspace{\defaultletterspace}\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]{330pt}{%
    \begin{center}%
```

```
      \underline{\bf\letterspace{\defaultletterspace}\schoolyear@term\  \schl@schoolyear}%
    \end{center}
    \begin{tabular}{|c|p{60pt}|p{40pt}|p{60pt}|}
      \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. Macro `\signer{`⟨*name*⟩`}` accepts the name of a signer. `\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\signer[1]{\par #1}
\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}
}
```