The HomeworkAssignment class*

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1 Abstract

This class provides a relative simple docuemnt–type for homework, mainly created for assignments at the University This class is inherited from `article`, it is not perfect, but I am trying my verry best.

2 Options

`problemstyle=<1>`
`subproblemstyle=<1>`
`subsubproblemstyle=<1>`

These options allow the customizatuion of the displayed numbers. For Example, if `problemstyle=Roman, subproblemstyle=arabic, subsubproblemstyle=roman` is passed, The first subsubproblem of the first subproblem of the first problem would be labled as **i)** of **Problem I.1**.
Available options are `arabic`, `Alph`, `alph`, `Roman`, and `roman`. Standard values are: `problemstyle=arabic, subproblemstyle=alph, subsubproblemstyle=roman`.

2.1 Inherited options

Because the class is inherited by Abstract, every Option that can be passed to article, will be passed to article.

2.2 LaTeXWarning: Unused global option(s)

Because the Options are handled via `kvoptions` and passed directly to `article`, LaTeXraises this warning. IMHO, the Options are used and this warning can be ignored. Nevertheless I am working on it.

3 Commands

3.1 Document Informations

`\subject`
`\kurs`

Sets the subject of the document. Takes the subject as argument. Standard Value

*This document corresponds to HomeworkAssignment v1.5.2,dated 2017\04\30.

is “Kein Kurs”
`\kurs` is deprecated.

`\tutorial` `\tutorium` Sets the tutorial of the author. Takes it as an argument. Stamdard Value is empty, so that this command can be omitted.
`\tutorium` is deprecated.

`\deadline` `\abgabe` Sets the deadline of the document. Takes it as an argument. Standard value is `\today`.
`\abgabe` is deprecated

3.1.1 Inherited from `article`

`\author` Sets the author of the document.
`\date` Sets the date of the document.

3.2 Sectioning

Because the class is designed for Assignments, the sectioning-commands are different from Article

3.2.1 ‘plain’ Sectioning

`\problem` `\subproblem` `\subsubproblem` These commands work like theyr counterpart in article, except that there will be no number, nor will they increase a counter. Nevertheless, hey will be shown in the table of contents.

`\solution` `\proof` `\given` `\toShow` They work like Paragraph, but do not take an argument, instead they print out “Lösung”, “Beweis” “Gegeben”, and “Zu zeigen”, respectively[1]. They are not mentioned in the table of contents.

3.2.2 ‘better’ Sectioning

The following commands are an augmented version of the “plain” commands.

`\newproblem` `\newsubproblem` `\newsubsubproblem` These commands require no argument, and automatically create a numbered title. The optional Argument is the new value for the coresponding counter.

3.3 Useful Macros

`\QED` `\EOP` `\eop` Display a flushed-right *QED*, □, or ■, respectively. `\qed` is not implemented, to keep compatibility to several Math-packages, which define the later.

[1] As of v1.6, Translations are added, depending on the choosen Language, there may be an other Text displayes.
See 7.2 for all Translations

4 Pagestyle

4.1 Headers

5 Development and support

The package is developed at *github*:

`https://github.com/ACHinrichs/LaTeX-templates`

Please refer to that site for any bug report or development information.

6 Changelog

v1.0 - 2016/10/23 Intial

v1.1 - 2016/11/02 ...

v1.2 - 2016/11/03 ...

v1.3 - 2016/12/01 Provide the Class as .dtx file and more

v1.4 - 2017/04/29 "Minor" bugfixes

v1.5 - 2017/04/29 Problems are displayed in the table of contents. Type of numeration is now configurable.

v1.5.1 - 2017/04/29 Bugfix

v1.5.2 - 2017/04/29 Add version-number

v1.6 - 2017/05/02 Add Translations (German and English)
Add `\given` and `\toShow`
Add `\QED`, `\EOP`, and `\eop`

7 Implementation

The following part is verry boring, but I have not found a solution to create a `.cls`–file without including the implemetation into the document. Loads LaTeX2e and sets the Version Loads the `article`, which is the base-class.

7.1 Packages & Options

```
\RequirePackage{kvoptions}
\SetupKeyvalOptions{ family=hwa,
  prefix=hwa@ }
\DeclareStringOption[arabic]{problemsty}
\DeclareStringOption[alph]{subproblemsty}
\DeclareStringOption[roman]{subsubproblemsty}
\DeclareBoolOption[false]{listings}
% Redefine the article-options
%    \begin{macrocode}
\DeclareDefaultOption{\PassOptionsToClass{\CurrentOptionKey}{article}}
```

Processes the Options and loades article

```
\ProcessKeyvalOptions*
\LoadClass{article}
```

Loads required Packages

```
\RequirePackage{suffix}
\RequirePackage{fancyhdr}
\RequirePackage{ifthen}
\RequirePackage{translations}
\RequirePackage{amssymb}

\ifhwa@listings
  \RequirePackage{listings}
  \lstset{
    frame = single,
    breaklines = true,
    postbreak=\raisebox{0ex}[0ex][0ex]{\ensuremath{\hookrightarrow\space}},
    basicstyle=\scriptsize
  }
\else
\fi
```

7.2 Translations

Load translations, currently supports English and German, Fallback is German

```
\DeclareTranslationFallback{aufgabe}{Aufgabe}
\DeclareTranslationFallback{loesung}{L\"osung}
\DeclareTranslationFallback{beweis}{Beweis}
\DeclareTranslationFallback{uebungsgruppe}{\"Ubungsgruppe}
\DeclareTranslationFallback{abgabe}{Abgabe}
\DeclareTranslationFallback{zuZeigen}{Zu zeigen}
\DeclareTranslationFallback{gegeben}{Gegeben}
```

```
36
37 \DeclareTranslation{German}{aufgabe}{Aufgabe}
38 \DeclareTranslation{German}{loesung}{L\"osung}
39 \DeclareTranslation{German}{beweis}{Beweis}
40 \DeclareTranslation{German}{uebungsgruppe}{\"Ubungsgruppe}
41 \DeclareTranslation{German}{abgabe}{Abgabe}
42 \DeclareTranslation{German}{zuZeigen}{Zu zeigen:}
43 \DeclareTranslation{German}{gegeben}{Gegeben}
44
45 \DeclareTranslation{English}{aufgabe}{Problem}
46 \DeclareTranslation{English}{loesung}{Solution}
47 \DeclareTranslation{English}{beweis}{Proof}
48 \DeclareTranslation{English}{uebungsgruppe}{Tutorial}
49 \DeclareTranslation{English}{abgabe}{Deadline}
50 \DeclareTranslation{English}{zuZeigen}{To show}
51 \DeclareTranslation{German}{gegeben}{Given}
```

7.3 Headers & Footers

Sets the page-headers.
All headers are cleread before they get any Text — just to be sure.
The headers look like specified above (4.1). Also inserts the Titlepage.

```
52
53 \fancypagestyle{firstpage}{
54   %
55   \fancyhf{}
56   % clear all six fields
57   \renewcommand{\headrulewidth}{.7pt}
58   \renewcommand{\footrulewidth}{0pt} \fancyfoot[RE,LO]{\thepage}
59   \fancyhead[L]{\hwa@tutorium} \fancyhead[R]{\@date } }
60 \fancypagestyle{followingpage}{
61   %
62   \fancyhf{}
63   % clear all six fields
64   \fancyhead[RE,LO]{\@author} \fancyhead[LE,RO]{\hwa@kurs\\ \GetTranslation{abgabe}:
65     \hwa@abgabe} \fancyfoot[RE,LO]{\thepage}
66   \renewcommand{\headrulewidth}{0.7pt}
67   \renewcommand{\footrulewidth}{0pt} } \pagestyle{followingpage}
68 \AtBeginDocument{ \thispagestyle{firstpage}
69   \setlength{\headheight}{25pt} }
```

7.4 Internal commands

7.4.1 Counter–Commands

`Counter--Commands` These are used to output the Exercise numbers in the desired style

```
70 \newcommand{\hwa@problemno}{\arabic{problem}}
71 \newcommand{\hwa@subproblemno}{\alph{subproblem}}
72 \newcommand{\hwa@subsubproblemno}{\roman{subsubproblem}}
```

7.4.2 Counter–Style Parser

Counter--Style Parser

This takes a style-input (#1), one of the three previous defined commands (#2) and the coresponding counter (#3) to redefine #1, so that it corresponds to #2. See 7.4.3 for example usement.

```
\newcommand{\hwa@parseCounterStyle}[3]{
  \ifthenelse{\equal{#1}{arabic}}{ \renewcommand{#2}{\arabic{#3}} }{
    \ifthenelse{\equal{#1}{roman}}{ \renewcommand{#2}{\roman{#3}} }{
      \ifthenelse{\equal{#1}{alph}}{ \renewcommand{#2}{\alph{#3}} }{
        \ifthenelse{\equal{#1}{Alph}}{ \renewcommand{#2}{\Alph{#3}} }{
          \ifthenelse{\equal{#1}{Roman}}{
            \renewcommand{#2}{\Roman{#3}} }{
            \ClassError{HomeworkAssignment}{Invalid Value #1 for
              option Counter-Styling}{Possible Values are alph,
              arabic, Arabic, roman or Roman.}  } } } } } }
```

7.4.3 Counter–Commands II

ounter--Style ParserCommands II

Redefines the three counter-commands

```
\hwa@parseCounterStyle{\hwa@problemsty}{\hwa@problemno}{problem}
\hwa@parseCounterStyle{\hwa@subproblemsty}{\hwa@subproblemno}{subproblem}
\hwa@parseCounterStyle{\hwa@subsubproblemsty}{\hwa@subsubproblemno}{subsubproblem}
```

7.5 Commands

\subject

Defines \kurs. \subject equals \kurs

```
\newcommand{\hwa@kurs}{?\GetTranslation{subject}?}
\newcommand{\subject}[1]{\renewcommand{\hwa@kurs}{#1}}
\newcommand{\kurs}[1]{\subject{#1}}
```

\tutorial

Defines \tutorial. \tutorium equals \tutorial

```
\newcommand{\hwa@tutorium}{?\GetTranslation{uebungsgruppe}?}
\newcommand{\tutorial}[1]{\renewcommand{\hwa@tutorium}{#1}}
\newcommand{\tutorium}[1]{\tutorial{#1}}
```

\deadline

Defines \deadline. \abgabe equals \deadline

```
\newcommand{\hwa@abgabe}{\today}
\newcommand{\deadline}[1]{\def\hwa@abgabe{#1}}
\newcommand{\abgabe}[1]{\deadline{#1}}
```

\maketitle

Overrides maketitle.

```

\renewcommand{\maketitle} {
  \begin{centering}
    \huge{\textbf{\hwa@kurs}} {\hrule height 2pt} \vspace{.25cm}
    \large
    \GetTranslation{abgabe}: \hwa@abgabe\\
    \vspace{.5cm} \hrule \vspace{.25cm}
```

```
    \normalsize{\@author}\\
    \vspace{.25cm} \hrule \vspace{.25cm} \normalsize
  \end{centering}
}
```

Defines and initialize all counters.

```
\newcounter{problem} \setcounter{problem}{0}
\newcounter{subproblem}[problem] \setcounter{subproblem}{0}
\newcounter{subsubproblem}[subproblem] \setcounter{subsubproblem}{0}

```

Defines 'plain' sectioning-commands. See 3.2 for more informations.

```
\newcommand{\problem}[1]{\@startsection{problem}%Name
  {1}%Level
  {\z@}%indent
  {-2em \@plus -1em \@minus -1em}%beforeskip
  {1ex \@plus .5ex}%afterskip
  {\normalfont\Large\bfseries}%style
  *{#1} \addcontentsline{toc}{section}{#1} }

\newcommand{\subproblem}[1]{\@startsection{subproblem}%Name
  {2}%Level
  {\z@}%indent
  {-1em \@plus -.5em \@minus -.5em}%beforeskip
  {.5ex \@plus .5ex}%afterskip
  {\normalfont\large\bfseries}%style
  *{#1} \addcontentsline{toc}{subsection}{#1} }

\newcommand{\subsubproblem}[1]{\@startsection{subsubproblem}%Name
  {3}%Level
  {\z@}%indent
  {-.5em}%beforeskip
  {.5em}%afterskip
  {\normalfont\bfseries}%style
  *{#1} }

\newcommand{\solution}[1][]{\@startsection{solution}%Name
  {4}%Level
  {\parindent}%indent
  {-.1em}%beforeskip
  {\z@}%afterskip
  {\normalfont\bfseries}%style
  *{\GetTranslation{loesung}\ifthenelse{\equal{#1}{}} {} { #1}:~~ } }

\newcommand{\proof}[1][]{\@startsection{proof}%Name
  {4}%Level
  {\parindent}%indent
  {-.1em}%beforeskip
  {\z@}%afterskip
  {\normalfont\bfseries}%style
```

```
  *{\GetTranslation{beweis}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }

\newcommand{\toShow}[1][]{\@startsection{to show}%Name
  {4}%Level
  {\parindent}%indent
  {-.1em}%beforeskip
  {\z@}%afterskip
  {\normalfont\bfseries}%style
  *{\GetTranslation{zuZeigen}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }

\newcommand{\given}[1][]{\@startsection{given}%Name
  {4}%Level
  {\parindent}%indent
  {-.1em}%beforeskip
  {\z@}%afterskip
  {\normalfont\bfseries}%style
  *{\GetTranslation{gegeben}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
```

Defines 'better' sectioning commands. See 3.2 and 3.2.2 for more informations.

```
\newcommand{\newproblem}[1][]{\stepcounter{problem}
  \ifthenelse{\equal{#1}{}} { } {\setcounter{problem}{#1}}
  \problem{\GetTranslation{aufgabe} \hwa@problemno} }

\newcommand{\newsubproblem}[1][]{\stepcounter{subproblem}
  \ifthenelse{\equal{#1}{}} { } {\setcounter{subproblem}{#1}}
  \subproblem{\GetTranslation{aufgabe} \hwa@problemno{}.\hwa@subproblemno} }

\newcommand{\newsubsubproblem}[1][]{\stepcounter{subsubproblem}
  \ifthenelse{\equal{#1}{}} { } {\setcounter{subsubproblem}{#1}}
  \subsubproblem{\hwa@subsubproblemno)} }
```

End of Proof

```
\newcommand{\QED}{\begin{flushright}
    \textit{QED}
  \end{flushright}
}
\newcommand{\EOP}{\begin{flushright}
    $\square$
  \end{flushright}
}
\newcommand{\eop}{\begin{flushright}
    $\blacksquare$
  \end{flushright}
}
```

The End

```
\endinput
```