

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 very best.

2 Options

`problemstyle=<1>` These options allow the customizatuion of the displayed numbers. For Example, if
`subproblemstyle=<1>` `problemstyle=Roman`, `subproblemstyle=arabic`, `subsubproblemstyle=roman`
`subsubproblemstyle=<1>` 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 \LaTeX Warning: Unused global option(s)

Because the Options are handled via `kvoptions` and passed directly to `article`, \LaTeX raises 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` Sets the subject of the document. Takes the subject as argument. Standard Value
`\kurs`

*This document corresponds to HomeworkAssignment v1.6.3,dated 2017\04\30.

is “Kein Kurs”
`\kurs` is deprecated.

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

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

`\solution` They work like Paragraph, but do not take an argument, instead they print out “Lösung”, “Beweis”, “Gegeben”, and “Zu zeigen”, respectively¹. They are not mentioned in the table of contents.
`\proof`
`\given`
`\toShow`

3.2.2 ‘better’ Sectioning

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

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

3.3 Useful Macros

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

`\EOP`
`\eop` ¹As of v1.6, Translations are added, depending on the chosen Language, there may be an other Text displays.
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`

v1.6.3 - 2017/05/05 Bugfixes

7 Implementation

The following part is very boring, but I have not found a solution to create a .cls-file without including the implementation into the document. Loads L^AT_EX2e and sets the Version Loads the `article`, which is the base-class.

7.1 Packages & Options

```
1 \RequirePackage{kvoptions}
2 \SetupKeyvalOptions{ family=hwa,
3   prefix=hwa@ }
4 \DeclareStringOption[arabic]{problemsty}
5 \DeclareStringOption[alph]{subproblemsty}
6 \DeclareStringOption[roman]{subsubproblemsty}
7 \DeclareBoolOption[false]{listings}
8 % Redefine the article-options
9 %   \begin{macrocode}
10 \DeclareDefaultOption{\PassOptionsToClass{\CurrentOptionKey}{article}}

    Processes the Options and loads article
11 \ProcessKeyvalOptions*
12 \LoadClass{article}

    Loads required Packages
13 \RequirePackage{suffix}
14 \RequirePackage{fancyhdr}
15 \RequirePackage{ifthen}
16 \RequirePackage{translations}
17 \RequirePackage{amssymb}
18
19 \ifhwa@listings
20   \RequirePackage{listings}
21   \lstset{
22     frame = single,
23     breaklines = true,
24     postbreak=\raisebox{0ex}[0ex][0ex]{\ensuremath{\hookrightarrow}\space}},
25     basicstyle=\scriptsize
26   }
27 \else
28   \empty
29 \fi
```

7.2 Translations

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

```
30 \DeclareTranslationFallback{aufgabe}{Aufgabe}
31 \DeclareTranslationFallback{loesung}{L"osung}
32 \DeclareTranslationFallback{beweis}{Beweis}
33 \DeclareTranslationFallback{uebungsgruppe}{\ "Ubungsgruppe}
34 \DeclareTranslationFallback{abgabe}{Abgabe}
35 \DeclareTranslationFallback{zuZeigen}{Zu zeigen}
```

```

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

```

53
54 \fancypagestyle{firstpage}{
55   %
56   \fancyhf{}
57   % clear all six fields
58   \renewcommand{\headrulewidth}{.7pt}
59   \renewcommand{\footrulewidth}{0pt} \fancyfoot[RE,LO]{\thepage}
60   \fancyhead[L]{\hwa@tutorium} \fancyhead[R]{\@date } }
61 \fancypagestyle{followingpage}{
62   %
63   \fancyhf{}
64   % clear all six fields
65   \fancyhead[RE,LO]{\@author} \fancyhead[LE,RO]{\hwa@kurs\ \GetTranslation{abgabe}:
66     \hwa@abgabe} \fancyfoot[RE,LO]{\thepage}
67   \renewcommand{\headrulewidth}{0.7pt}
68   \renewcommand{\footrulewidth}{0pt} } \pagestyle{followingpage}
69 \AtBeginDocument{ \thispagestyle{firstpage}
70   \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

```

71 \newcommand{\hwa@problemno}{\arabic{problem}}
72 \newcommand{\hwa@subproblemno}{\alph{subproblem}}

```

```
73 \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 corresponding counter (#3) to redefine #1, so that it corresponds to #2. See 7.4.3 for example usement.

```
74 \newcommand{\hwa@parseCounterStyle}[3]{
75   \ifthenelse{\equal{#1}{arabic}}{ \renewcommand{#2}{\arabic{#3}} }{
76     \ifthenelse{\equal{#1}{roman}}{ \renewcommand{#2}{\roman{#3}} }{
77       \ifthenelse{\equal{#1}{alph}}{ \renewcommand{#2}{\alph{#3}} }{
78         \ifthenelse{\equal{#1}{Alph}}{ \renewcommand{#2}{\Alph{#3}} }{
79           \ifthenelse{\equal{#1}{Roman}}{
80             \renewcommand{#2}{\Roman{#3}} }{
81             \ClassError{HomeworkAssignment}{Invalid Value #1 for
82               option Counter-Styling}{Possible Values are alph,
83               arabic, Arabic, roman or Roman.} } } } } }
```

7.4.3 Counter–Commands II

Counter--Style ParserCommands II Redefines the three counter-commands

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

7.5 Commands

\subject Defines \kurs. \subject equals \kurs

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

\tutorial Defines \tutorial. \tutorium equals \tutorial

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

\deadline Defines \deadline. \abgabe equals \deadline

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

\maketitle Overrides maketitle.

```
96
97 \renewcommand{\maketitle} {
98   \begin{centering}
99     \huge{\textbf{\hwa@kurs}} \vspace{.25cm} {\hrule height 2pt} \vspace{.25cm}
100    \large
```

```

101 \GetTranslation{abgabe}: \hwa@abgabe\\
102 \vspace{.5cm} \hrule \vspace{.25cm}
103 \normalsize{\@author}\\
104 \vspace{.25cm} \hrule \vspace{.25cm} \normalsize
105 \end{centering}
106 }

```

Defines and initialize all counters.

```

107 \newcounter{problem} \setcounter{problem}{0}
108 \newcounter{subproblem}[problem] \setcounter{subproblem}{0}
109 \newcounter{subsubproblem}[subproblem] \setcounter{subsubproblem}{0}
110

```

Defines ‘plain’ sectioning-commands. See 3.2 for more informations.

```

111 \newcommand{\problem}[1]{\@startsection{problem}%Name
112 {1}%Level
113 {\z@}%indent
114 {-2em \@plus -1em \@minus -1em}%beforeskip
115 {1ex \@plus .5ex}%afterskip
116 {\normalfont\Large\bfseries}%style
117 *{#1} \addcontentsline{toc}{section}{#1} }
118
119 \newcommand{\subproblem}[1]{\@startsection{subproblem}%Name
120 {2}%Level
121 {\z@}%indent
122 {-1em \@plus -.5em \@minus -.5em}%beforeskip
123 {.5ex \@plus .5ex}%afterskip
124 {\normalfont\large\bfseries}%style
125 *{#1} \addcontentsline{toc}{subsection}{#1} }
126
127 \newcommand{\subsubproblem}[1]{\@startsection{subsubproblem}%Name
128 {3}%Level
129 {\z@}%indent
130 {-.5em}%beforeskip
131 {.5em}%afterskip
132 {\normalfont\bfseries}%style
133 *{#1} }
134
135 \newcommand{\solution}[1][\@startsection{solution}%Name
136 {4}%Level
137 {\parindent}%indent
138 {-.1em}%beforeskip
139 {\z@}%afterskip
140 {\normalfont\bfseries}%style
141 *{\GetTranslation{loesung}\ifthenelse{\equal{#1}{}} {} { #1}:~~ } }
142
143 \newcommand{\proof}[1][\@startsection{proof}%Name
144 {4}%Level
145 {\parindent}%indent
146 {-.1em}%beforeskip

```



```

147 {\z@}%afterskip
148 {\normalfont\bfseries}%style
149 *{\GetTranslation{beweis}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
150
151 \newcommand{\toShow}[1][\@startsection{to show}%Name
152 {4}%Level
153 {\parindent}%indent
154 {- .1em}%beforeskip
155 {\z@}%afterskip
156 {\normalfont\bfseries}%style
157 *{\GetTranslation{zuZeigen}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
158
159 \newcommand{\given}[1][\@startsection{given}%Name
160 {4}%Level
161 {\parindent}%indent
162 {- .1em}%beforeskip
163 {\z@}%afterskip
164 {\normalfont\bfseries}%style
165 *{\GetTranslation{gegeben}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
166
167
168 Defines ‘better’ sectioning commands. See 3.2 and 3.2.2 for more informations.
169 \newcommand{\newproblem}[1][\stepcounter{problem}
170 \ifthenelse{\equal{#1}{} } {} {\setcounter{problem}{#1}}
171 \problem{\GetTranslation{aufgabe} \hwa@problemno} }
172
173 \newcommand{\newsproblem}[1][\stepcounter{subproblem}
174 \ifthenelse{\equal{#1}{} } {} {\setcounter{subproblem}{#1}}
175 \subproblem{\GetTranslation{aufgabe} \hwa@problemno}.\hwa@subproblemno} }
176
177 \newcommand{\newsproblem}[1][\stepcounter{subsubproblem}
178 \ifthenelse{\equal{#1}{} } {} {\setcounter{subsubproblem}{#1}}
179 \subsubproblem{\hwa@subsubproblemno} }
180

```

End of Proof

```

181 \newcommand{\QED}{\begin{flushright}
182 \textit{QED}
183 \end{flushright}}
184
185 \newcommand{\EOP}{\begin{flushright}
186 $\square$
187 \end{flushright}}
188
189 \newcommand{\eop}{\begin{flushright}
190 $\blacksquare$
191 \end{flushright}}
192

```

The End

191 \endinput