

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

<code>\subject</code> <code>\kurs</code>	Sets the subject of the document. Takes the subject as argument. Standard Value <hr/> *This document corresponds to HomeworkAssignment v1.5.2,dated 2017\04\30.
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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`

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_EX2_ε 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 \ifthenelse{\hwa@lstlisting}{
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 }{}
```

7.2 Translations

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

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

```

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

```

51
52 \fancypagestyle{firstpage}{
53   %
54   \fancyhf{}
55   % clear all six fields
56   \renewcommand{\headrulewidth}{.7pt}
57   \renewcommand{\footrulewidth}{0pt} \fancyfoot[RE,LO]{\thepage}
58   \fancyhead[L]{\hwa@tutorium} \fancyhead[R]{\date } }
59 \fancypagestyle{followingpage}{
60   %
61   \fancyhf{}
62   % clear all six fields
63   \fancyhead[RE,LO]{\@author} \fancyhead[LE,RO]{\hwa@kurs\ \GetTranslation{abgabe}:
64     \hwa@abgabe} \fancyfoot[RE,LO]{\thepage}
65   \renewcommand{\headrulewidth}{0.7pt}
66   \renewcommand{\footrulewidth}{0pt} } \pagestyle{followingpage}
67 \AtBeginDocument{ \thispagestyle{firstpage}
68   \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

```

69 \newcommand{\hwa@problemno}{\arabic{problem}}
70 \newcommand{\hwa@subproblemno}{\alph{subproblem}}
71 \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.

```

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

7.4.3 Counter–Commands II

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

```

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

7.5 Commands

\subject Defines \kurs. \subject equals \kurs

```

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

\tutorial Defines \tutorial. \tutorial equals \tutorial

```

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

\deadline Defines \deadline. \abgabe equals \deadline

```

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

\maketitle Overrides maketitle.

```

94
95 \renewcommand{\maketitle} {
96   \begin{centering}
97     \huge{\textbf{\hwa@kurs}} {\hrule height 2pt} \vspace{.25cm}
98     \large
99     \GetTranslation{abgabe}: \hwa@abgabe\\
100    \vspace{.5cm} \hrule \vspace{.25cm}
```

```

101 \normalsize{\@author}\\
102 \vspace{.25cm} \hrule \vspace{.25cm} \normalsize
103 \end{centering}
104 }

```

Defines and initialize all counters.

```

105 \newcounter{problem} \setcounter{problem}{0}
106 \newcounter{subproblem}[problem] \setcounter{subproblem}{0}
107 \newcounter{subsubproblem}[subproblem] \setcounter{subsubproblem}{0}
108

```

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

```

109 \newcommand{\problem}[1]{\@startsection{problem}%Name
110 {1}%Level
111 {\z@}%indent
112 {-2em \@plus -1em \@minus -1em}%beforeskip
113 {1ex \@plus .5ex}%afterskip
114 {\normalfont\Large\bfseries}%style
115 *{#1} \addcontentsline{toc}{section}{#1} }
116
117 \newcommand{\subproblem}[1]{\@startsection{subproblem}%Name
118 {2}%Level
119 {\z@}%indent
120 {-1em \@plus -.5em \@minus -.5em}%beforeskip
121 {.5ex \@plus .5ex}%afterskip
122 {\normalfont\large\bfseries}%style
123 *{#1} \addcontentsline{toc}{subsection}{#1} }
124
125 \newcommand{\subsubproblem}[1]{\@startsection{subsubproblem}%Name
126 {3}%Level
127 {\z@}%indent
128 {-.5em}%beforeskip
129 {.5em}%afterskip
130 {\normalfont\bfseries}%style
131 *{#1} }
132
133 \newcommand{\solution}[1] [] {\@startsection{solution}%Name
134 {4}%Level
135 {\parindent}%indent
136 {-.1em}%beforeskip
137 {\z@}%afterskip
138 {\normalfont\bfseries}%style
139 *{\GetTranslation{loesung}\ifthenelse{\equal{#1}{}} {} { #1:~~ } }
140
141 \newcommand{\proof}[1] [] {\@startsection{proof}%Name
142 {4}%Level
143 {\parindent}%indent
144 {-.1em}%beforeskip
145 {\z@}%afterskip
146 {\normalfont\bfseries}%style

```



```

147 *{\GetTranslation{beweis}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
148
149 \newcommand{\toShow}[1] [] {\@startsection{to show}%Name
150 {4}%Level
151 {\parindent}%indent
152 {- .1em}%beforeskip
153 {\z@}%afterskip
154 {\normalfont\bfseries}%style
155 *{\GetTranslation{zuZeigen}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
156
157 \newcommand{\given}[1] [] {\@startsection{given}%Name
158 {4}%Level
159 {\parindent}%indent
160 {- .1em}%beforeskip
161 {\z@}%afterskip
162 {\normalfont\bfseries}%style
163 *{\GetTranslation{gegeben}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
164

```

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

```

165 \newcommand{\newproblem}[1] [] {\stepcounter{problem}
166 \ifthenelse{\equal{#1}{} } { } {\setcounter{problem}{#1}}
167 \problem{\GetTranslation{aufgabe} \hwa@problemno} }
168
169 \newcommand{\newsubproblem}[1] [] {\stepcounter{subproblem}
170 \ifthenelse{\equal{#1}{} } { } {\setcounter{subproblem}{#1}}
171 \subproblem{\GetTranslation{Aufgabe} \hwa@problemno}.\hwa@subproblemno} }
172
173 \newcommand{\newsbsubproblem}[1] [] {\stepcounter{subsubproblem}
174 \ifthenelse{\equal{#1}{} } { } {\setcounter{subsubproblem}{#1}}
175 \subsubproblem{\hwa@subsubproblemno} }
176

```

End of Proof

```

177 \newcommand{\QED}{\begin{flushright}
178 \textit{QED}
179 \end{flushright}
180 }
181 \newcommand{\EOP}{\begin{flushright}
182 $\square$
183 \end{flushright}
184 }
185 \newcommand{\eop}{\begin{flushright}
186 $\blacksquare$
187 \end{flushright}
188 }

```

The End

```

189 \endinput

```