

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>	<div>Sets the subject of the document. Takes the subject as argument. Standard Value</div> <hr/> <div>*This document corresponds to HomeworkAssignment v1.5.2,dated 2017\04\30.</div>
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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_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 % Redefine the article-options
8 %   \begin{macrocode}
9 \DeclareDefaultOption{\PassOptionsToClass{\CurrentOptionKey}{article}}

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

Loads required Packages
12 \RequirePackage{suffix}
13 \RequirePackage{fancyhdr}
14 \RequirePackage{ifthen}
15 \RequirePackage{translations}
16 \RequirePackage{amssymb}
```

7.2 Translations

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

```
17 \DeclareTranslationFallback{aufgabe}{Aufgabe}
18 \DeclareTranslationFallback{loesung}{L"osung}
19 \DeclareTranslationFallback{beweis}{Beweis}
20 \DeclareTranslationFallback{uebungsgruppe}{\ "Ubungsgruppe}
21 \DeclareTranslationFallback{abgabe}{Abgabe}
22 \DeclareTranslationFallback{zuZeigen}{Zu zeigen}
23 \DeclareTranslationFallback{gegeben}{Gegeben}
24
25 \DeclareTranslation{German}{aufgabe}{Aufgabe}
26 \DeclareTranslation{German}{loesung}{L"osung}
27 \DeclareTranslation{German}{beweis}{Beweis}
28 \DeclareTranslation{German}{uebungsgruppe}{\ "Ubungsgruppe}
29 \DeclareTranslation{German}{abgabe}{Abgabe}
30 \DeclareTranslation{German}{zuZeigen}{Zu zeigen:}
31 \DeclareTranslation{German}{gegeben}{Gegeben}
32
33 \DeclareTranslation{English}{aufgabe}{Problem}
34 \DeclareTranslation{English}{loesung}{Solution}
35 \DeclareTranslation{English}{beweis}{Proof}
```

```

36 \DeclareTranslation{English}{uebungsgruppe}{Tutorial}
37 \DeclareTranslation{English}{abgabe}{Deadline}
38 \DeclareTranslation{English}{zuZeigen}{To show}
39 \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.

```

40
41 \fancypagestyle{firstpage}{
42   %
43   \fancyhf{}
44   % clear all six fields
45   \renewcommand{\headrulewidth}{.7pt}
46   \renewcommand{\footrulewidth}{0pt} \fancyfoot[RE,LO]{\thepage}
47   \fancyhead[L]{\hwa@tutorium} \fancyhead[R]{\@date } }
48 \fancypagestyle{followingpage}{
49   %
50   \fancyhf{}
51   % clear all six fields
52   \fancyhead[RE,LO]{\@author} \fancyhead[LE,RO]{\hwa@kurs\ \GetTranslation{abgabe}:
53     \hwa@abgabe} \fancyfoot[RE,LO]{\thepage}
54   \renewcommand{\headrulewidth}{0.7pt}
55   \renewcommand{\footrulewidth}{0pt} } \pagestyle{followingpage}
56 \AtBeginDocument{ \thispagestyle{firstpage}
57   \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

```

58 \newcommand{\hwa@problemno}{\arabic{problem}}
59 \newcommand{\hwa@subproblemno}{\alph{subproblem}}
60 \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.

```

61 \newcommand{\hwa@parseCounterStyle}[3]{
62   \ifthenelse{\equal{#1}{arabic}}{ \renewcommand{#2}{\arabic{#3}} }{
63     \ifthenelse{\equal{#1}{roman}}{ \renewcommand{#2}{\roman{#3}} }{
64       \ifthenelse{\equal{#1}{alph}}{ \renewcommand{#2}{\alph{#3}} }{
65         \ifthenelse{\equal{#1}{Alph}}{ \renewcommand{#2}{\Alph{#3}} }{

```

```

66         \ifthenelse{\equal{#1}{Roman}}{
67             \renewcommand{#2}{\Roman{#3}} }{
68             \ClassError{HomeworkAssignment}{Invalid Value #1 for
69                 option Counter-Styling}{Possible Values are alph,
70                 arabic, Arabic, roman or Roman.} } } } } }

```

7.4.3 Counter-Commands II

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

```

71 \hwa@parseCounterStyle{\hwa@problemsty}{\hwa@problemno}{problem}
72 \hwa@parseCounterStyle{\hwa@subproblemsty}{\hwa@subproblemno}{subproblem}
73 \hwa@parseCounterStyle{\hwa@subsubproblemsty}{\hwa@subsubproblemno}{subsubproblem}

```

7.5 Commands

```

\subject Defines \kurs. \subject equals \kurs
74 \newcommand{\hwa@kurs}{?\GetTranslation{subject}??}
75 \newcommand{\subject}[1]{\renewcommand{\hwa@kurs}{#1}}
76 \newcommand{\kurs}[1]{\subject{#1}}

\tutorial Defines \tutorial. \tutorium equals \tutorial
77 \newcommand{\hwa@tutorium}{?\GetTranslation{uebungsgruppe}??}
78 \newcommand{\tutorial}[1]{\renewcommand{\hwa@tutorium}{#1}}
79 \newcommand{\tutorium}[1]{\tutorial{#1}}

\deadline Defines \deadline. \abgabe equals \deadline
80 \newcommand{\hwa@abgabe}{\today}
81 \newcommand{\deadline}[1]{\def\hwa@abgabe{#1}}
82 \newcommand{\abgabe}[1]{\deadline{#1}}

\maketitle Overrides maketitle.
83
84 \renewcommand{\maketitle} {
85     \begin{centering}
86         \huge{\textbf{\hwa@kurs}} {\hrule height 2pt} \vspace{.25cm}
87         \large
88         \GetTranslation{abgabe}: \hwa@abgabe\\
89         \vspace{.5cm} \hrule \vspace{.25cm}
90         \normalsize{\@author}\\
91         \vspace{.25cm} \hrule \vspace{.25cm} \normalsize
92     \end{centering}
93 }

Defines and initialize all counters.
94 \newcounter{problem} \setcounter{problem}{0}
95 \newcounter{subproblem}[problem] \setcounter{subproblem}{0}
96 \newcounter{subsubproblem}[subproblem] \setcounter{subsubproblem}{0}
97

```

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

```

98 \newcommand{\problem}[1]{\@startsection{problem}%Name
99   {1}%Level
100   {\z@}%indent
101   {-2em \@plus -1em \@minus -1em}%beforeskip
102   {1ex \@plus .5ex}%afterskip
103   {\normalfont\Large\bfseries}%style
104   *{#1} \addcontentsline{toc}{section}{#1} }
105
106 \newcommand{\subproblem}[1]{\@startsection{subproblem}%Name
107   {2}%Level
108   {\z@}%indent
109   {-1em \@plus -.5em \@minus -.5em}%beforeskip
110   {.5ex \@plus .5ex}%afterskip
111   {\normalfont\large\bfseries}%style
112   *{#1} \addcontentsline{toc}{subsection}{#1} }
113
114 \newcommand{\subsubproblem}[1]{\@startsection{subsubproblem}%Name
115   {3}%Level
116   {\z@}%indent
117   {-.5em}%beforeskip
118   {.5em}%afterskip
119   {\normalfont\bfseries}%style
120   *{#1} }
121
122 \newcommand{\solution}[1][ ]{\@startsection{solution}%Name
123   {4}%Level
124   {\parindent}%indent
125   {-.1em}%beforeskip
126   {\z@}%afterskip
127   {\normalfont\bfseries}%style
128   *{\GetTranslation{loesung}\ifthenelse{\equal{#1}{}} {} { { #1}:~~ } }
129
130 \newcommand{\proof}[1][ ]{\@startsection{proof}%Name
131   {4}%Level
132   {\parindent}%indent
133   {-.1em}%beforeskip
134   {\z@}%afterskip
135   {\normalfont\bfseries}%style
136   *{\GetTranslation{beweis}\ifthenelse{\equal{#1}{}} {} { { #1}:~~ } }
137
138 \newcommand{\toShow}[1][ ]{\@startsection{to show}%Name
139   {4}%Level
140   {\parindent}%indent
141   {-.1em}%beforeskip
142   {\z@}%afterskip
143   {\normalfont\bfseries}%style
144   *{\GetTranslation{zuZeigen}\ifthenelse{\equal{#1}{}} {} { { #1}:~~ } }
145

```



```

146 \newcommand{\given}[1][\@startsection{given}%Name
147   {4}%Level
148   {\parindent}%indent
149   {-1em}%beforeskip
150   {\z@}%afterskip
151   {\normalfont\bfseries}%style
152   *{\GetTranslation{gegeben}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
153
154 \newcommand{\newproblem}[1][\stepcounter{problem}
155   \ifthenelse{\equal{#1}{} } {} {\setcounter{problem}{#1}}
156   \problem{\GetTranslation{aufgabe} \hwa@problemno} }
157
158 \newcommand{\newsubproblem}[1][\stepcounter{subproblem}
159   \ifthenelse{\equal{#1}{} } {} {\setcounter{subproblem}{#1}}
160   \subproblem{\GetTranslation{Aufgabe} \hwa@problemno}.\hwa@subproblemno} }
161
162 \newcommand{\newsbsubproblem}[1][\stepcounter{subsubproblem}
163   \ifthenelse{\equal{#1}{} } {} {\setcounter{subsubproblem}{#1}}
164   \subsubproblem{\hwa@subsubproblemno} }
165

```

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

End of Proof

```

166 \newcommand{\QED}{\begin{flushright}
167   \textit{QED}
168 \end{flushright}
169 }
170 \newcommand{\EOP}{\begin{flushright}
171   $\square$
172 \end{flushright}
173 }
174 \newcommand{\eop}{\begin{flushright}
175   $\blacksquare$
176 \end{flushright}
177 }

```

The End

```

178 \endinput

```