

The HomeworkAssignment class*

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1 Abstract

This class provides a relative simple document-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

<code>problemstyle=<1></code>	These options allow the customization of the displayed numbers. For Example, if
<code>subproblemstyle=<1></code>	<code>problemstyle=Roman</code> , <code>subproblemstyle=arabic</code> , <code>subsubproblemstyle=roman</code>
<code>subsubproblemstyle=<1></code>	is passed, The first subsubproblem of the first subproblem of the first problem would be labeled as i) of Problem I.1 .
	Available options are <code>arabic</code> , <code>Alph</code> , <code>alph</code> , <code>Roman</code> , and <code>roman</code> . Standard values are: <code>problemstyle=arabic</code> , <code>subproblemstyle=alph</code> , <code>subsubproblemstyle=roman</code> .
<code>design=<1></code>	Allows the User to select an older page-style, for backwards compatibility. Recognized values are <code>v1</code> and <code>v2</code> . Everytime a version changes the default look, a new possible value will be added.
	Only set this if you really need to get an old look, <i>older styles are not going to be maintained!</i>

2.1 Inherited options

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

3 Commands

3.1 Document Informations

<code>\subject</code>	Sets the subject of the document. Takes the subject as argument. Standard Value
<code>\kurs</code>	<hr/> *This document corresponds to HomeworkAssignment v1.7,dated 2017/05/12.

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`
`\newsproblem`

3.3 Useful Macros

3.3.1 Quod Erat Demunstarndum, End of Proof

`\QED` Display a flushed-right *QED*, □, or ■, 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 displayed.
See 8.2 for all Translations

3.3.2 Quod Non Erat Demunstarndum at iucundum est

`\QED` Display a flushed-right \triangle . `\QED` displays it in a new line, `\qned` at the end of the same line.

In Mathematical proofs this symbol is used to mark things, which we did not intend to proof, but are interesting anyway.

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

v1.6.4 - 2017/05/09 Change `\eop` to be in the same line

v1.7 - 2017/05/09 Add `\QNEd`

v2.0 - 2017/05/09 Change Margins, add Option to select older Page-Style

7 Examples

For examples, please see the Git-Repo at <https://github.com/ACHinrichs/LaTeX-templates>

8 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.

8.1 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 \DeclareStringOption[v2]{design}
9 % Redefine the article-options
10 % \begin{macrocode}
11 \DeclareDefaultOption{\PassOptionsToClass{\CurrentOptionKey}{article}}

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

    Loads required Packages
14 \RequirePackage{suffix}
15 \RequirePackage{fancyhdr}
16 \RequirePackage{ifthen}
17 \RequirePackage{translations}
18 \RequirePackage{amssymb}
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
30
31 % Make sure that this is the last Package loaded
32 \ifthenelse{equal{hwa@design}{v2}}{
```

```

33 \RequirePackage{geometry}
34 \geometry{top=2cm, bottom=2cm, width=35em, headsep=14pt,hmarginratio={4:3}}
35 }{
36 \ifthenelse{\equal{\hwa@design}{v1}}{
37   \empty
38 }{
39   \ClassError{HomeworkAssignment}{Value '\hwa@design' for key 'design'
40     is not known}{The option design takes an argument to set the
41     Pagestyle to the one of a previous version. Acceptable values are
42     'v1', or 'v2'}
43 }
44 }

```

8.2 Translations

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

```

45 \DeclareTranslationFallback{aufgabe}{Aufgabe}
46 \DeclareTranslationFallback{loesung}{L"osung}
47 \DeclareTranslationFallback{beweis}{Beweis}
48 \DeclareTranslationFallback{uebungsgruppe}{\ "Ubungsgruppe}
49 \DeclareTranslationFallback{abgabe}{Abgabe}
50 \DeclareTranslationFallback{zuZeigen}{Zu zeigen}
51 \DeclareTranslationFallback{gegeben}{Gegeben}
52
53 \DeclareTranslation{German}{aufgabe}{Aufgabe}
54 \DeclareTranslation{German}{loesung}{L"osung}
55 \DeclareTranslation{German}{beweis}{Beweis}
56 \DeclareTranslation{German}{uebungsgruppe}{\ "Ubungsgruppe}
57 \DeclareTranslation{German}{abgabe}{Abgabe}
58 \DeclareTranslation{German}{zuZeigen}{Zu zeigen}
59 \DeclareTranslation{German}{gegeben}{Gegeben}
60
61 \DeclareTranslation{English}{aufgabe}{Problem}
62 \DeclareTranslation{English}{loesung}{Solution}
63 \DeclareTranslation{English}{beweis}{Proof}
64 \DeclareTranslation{English}{uebungsgruppe}{Tutorial}
65 \DeclareTranslation{English}{abgabe}{Deadline}
66 \DeclareTranslation{English}{zuZeigen}{To show}
67 \DeclareTranslation{English}{gegeben}{Given}

```

8.3 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.

```

68
69 \fancypagestyle{firstpage}{
70   %
71   \fancyhf{}
72   % clear all six fields

```

```

73 \renewcommand{\headrulewidth}{.7pt}
74 \renewcommand{\footrulewidth}{0pt} \fancyfoot[RE,LO]{\thepage}
75 \fancyhead[L]{\hwa@tutorium} \fancyhead[R]{\@date } }
76 \fancypagestyle{followingpage}{
77 %
78 \fancyhf{}
79 % clear all six fields
80 \fancyhead[RE,LO]{\@author} \fancyhead[LE,RO]{\hwa@kurs\ \GetTranslation{abgabe}:
81 \hwa@abgabe} \fancyfoot[RE,LO]{\thepage}
82 \renewcommand{\headrulewidth}{0.7pt}
83 \renewcommand{\footrulewidth}{0pt} } \pagestyle{followingpage}
84 \AtBeginDocument{ \thispagestyle{firstpage}
85 \setlength{\headheight}{25pt} }

```

8.4 Internal commands

8.4.1 Counter-Commands

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

```

86 \newcommand{\hwa@problemno}{\arabic{problem}}
87 \newcommand{\hwa@subproblemno}{\alph{subproblem}}
88 \newcommand{\hwa@subsubproblemno}{\roman{subsubproblem}}

```

8.4.2 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 8.4.3 for example usement.

```

89 \newcommand{\hwa@parseCounterStyle}[3]{
90 \ifthenelse{\equal{#1}{arabic}}{ \renewcommand{#2}{\arabic{#3}} }{
91 \ifthenelse{\equal{#1}{roman}}{ \renewcommand{#2}{\roman{#3}} }{
92 \ifthenelse{\equal{#1}{alph}}{ \renewcommand{#2}{\alph{#3}} }{
93 \ifthenelse{\equal{#1}{Alph}}{ \renewcommand{#2}{\Alph{#3}} }{
94 \ifthenelse{\equal{#1}{Roman}}{
95 \renewcommand{#2}{\Roman{#3}} }{
96 \ClassError{HomeworkAssignment}{Invalid Value #1 for
97 option Counter-Styling}{Possible Values are alph,
98 arabic, Arabic, roman or Roman.} } } } } }

```

8.4.3 Counter-Commands II

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

```

99 \hwa@parseCounterStyle{\hwa@problemsty}{\hwa@problemno}{problem}
100 \hwa@parseCounterStyle{\hwa@subproblemsty}{\hwa@subproblemno}{subproblem}
101 \hwa@parseCounterStyle{\hwa@subsubproblemsty}{\hwa@subsubproblemno}{subsubproblem}

```

8.5 Commands

```

\subject Defines \kurs. \subject equals \kurs
102 \newcommand{\hwa@kurs}{?\GetTranslation{subject}??}
103 \newcommand{\subject}[1]{\renewcommand{\hwa@kurs}{#1}}
104 \newcommand{\kurs}[1]{\subject{#1}}

\tutorial Defines \tutorial. \tutorium equals \tutorial
105 \newcommand{\hwa@tutorium}{?\GetTranslation{uebungsgruppe}??}
106 \newcommand{\tutorial}[1]{\renewcommand{\hwa@tutorium}{#1}}
107 \newcommand{\tutorium}[1]{\tutorial{#1}}

\deadline Defines \deadline. \abgabe equals \deadline
108 \newcommand{\hwa@abgabe}{\today}
109 \newcommand{\deadline}[1]{\def\hwa@abgabe{#1}}
110 \newcommand{\abgabe}[1]{\deadline{#1}}

\maketitle Overrides maketitle.
111
112 \renewcommand{\maketitle} {
113   \begin{centering}
114     \huge{\textbf{\hwa@kurs}} \vspace{.25cm} {\hrule height 2pt} \vspace{.25cm}
115     \large
116     \GetTranslation{abgabe}: \hwa@abgabe\\
117     \vspace{.5cm} \hrule \vspace{.25cm}
118     \normalsize{\@author}\\
119     \vspace{.25cm} \hrule \vspace{.25cm} \normalsize
120   \end{centering}
121 }

Defines and initialize all counters.
122 \newcounter{problem} \setcounter{problem}{0}
123 \newcounter{subproblem}[problem] \setcounter{subproblem}{0}
124 \newcounter{subsubproblem}[subproblem] \setcounter{subsubproblem}{0}
125

Defines ‘plain’ sectioning-commands. See 3.2 for more informations.
126 \newcommand{\problem}[1]{\@startsection{problem}%Name
127   {1}%Level
128   {\z@}%indent
129   {-2em \@plus -1em \@minus -1em}%beforeskip
130   {1ex \@plus .5ex}%afterskip
131   {\normalfont\Large\bfseries}%style
132   *{#1} \addcontentsline{toc}{section}{#1} }
133
134 \newcommand{\subproblem}[1]{\@startsection{subproblem}%Name
135   {2}%Level
136   {\z@}%indent
137   {-1em \@plus -.5em \@minus -.5em}%beforeskip
138   {.5ex \@plus .5ex}%afterskip

```



```

139 {\normalfont\large\bfseries}%style
140 *{#1} \addcontentsline{toc}{subsection}{#1} }
141
142 \newcommand{\subsubproblem}[1]{\@startsection{subsubproblem}%Name
143 {3}%Level
144 {\z@}%indent
145 {-.5em}%beforeskip
146 {.5em}%afterskip
147 {\normalfont\bfseries}%style
148 *{#1} }
149
150 \newcommand{\solution}[1] [] {\@startsection{solution}%Name
151 {4}%Level
152 {\parindent}%indent
153 {-.1em}%beforeskip
154 {\z@}%afterskip
155 {\normalfont\bfseries}%style
156 *{\GetTranslation{loesung}\ifthenelse{\equal{#1}{}} {} { #1}:~~ } }
157
158 \newcommand{\proof}[1] [] {\@startsection{proof}%Name
159 {4}%Level
160 {\parindent}%indent
161 {-.1em}%beforeskip
162 {\z@}%afterskip
163 {\normalfont\bfseries}%style
164 *{\GetTranslation{beweis}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
165
166 \newcommand{\toShow}[1] [] {\@startsection{to show}%Name
167 {4}%Level
168 {\parindent}%indent
169 {-.1em}%beforeskip
170 {\z@}%afterskip
171 {\normalfont\bfseries}%style
172 *{\GetTranslation{zuZeigen}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
173
174 \newcommand{\given}[1] [] {\@startsection{given}%Name
175 {4}%Level
176 {\parindent}%indent
177 {-.1em}%beforeskip
178 {\z@}%afterskip
179 {\normalfont\bfseries}%style
180 *{\GetTranslation{gegeben}\ifthenelse{\equal{#1} {} } {} { #1}:~~ } }
181
182 \newcommand{\newproblem}[1] [] {\stepcounter{problem}
183 \ifthenelse{\equal{#1}{}} {} {} {\setcounter{problem}{#1}}
184 \problem{\GetTranslation{aufgabe} \hwa@problemno} }
185
186 \newcommand{\newsproblem}[1] [] {\stepcounter{subproblem}

```

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

```

187 \ifthenelse{\equal{#1}{}} { } {\setcounter{subproblem}{#1}}
188 \subproblem{\GetTranslation{aufgabe} \hwa@problemno{.}\hwa@subproblemno} }
189
190 \newcommand{\newsesubproblem}[1] [] {\stepcounter{subsubproblem}
191 \ifthenelse{\equal{#1}{}} { } {\setcounter{subsubproblem}{#1}}
192 \subsubproblem{\hwa@subsubproblemno}} }
193

```

End of Proof

```

194 \newcommand{\QED}{\begin{flushright}
195 \textit{QED}
196 \end{flushright}
197 }
198 \newcommand{\EOP}{\begin{flushright}
199 $\square$
200 \end{flushright}
201 }
202 \newcommand{\eop}{\hfill$\blacksquare$}

```

c demonstrandum at iucundum est

```

203 \newcommand{\QNED}{\begin{flushright}
204 $\triangle$
205 \end{flushright}
206 }
207 \newcommand{\qned}{\hfill$\triangle$}

```

The End

```

208 \endinput

```