

The `m\luexercise` class^{*}

Jan Heinrich Reimer
Fachschaftsrat Mathematik/Informatik[†]
<https://fachschaft.mathinf.uni-halle.de>
fachschaft@mathinf.uni-halle.de

Released 2020/11/12

Contents

1	Introduction	1
2	Usage	2
2.1	Exercise Metadata	2
2.2	Student Metadata	2
2.3	Included Packages	3
3	Design Goals	3
4	Implementation	3
4.1	Setup	3
4.2	Global Variables	5
4.3	Layout, Text	5
4.4	Mathematics	7
4.5	Algorithms, Pseudocode	9
4.6	Code Listings	10
4.7	Graphics, Drawing, Plots	11
4.8	Document Hooks	11

1 Introduction

The `m\luexercise` class is a template class for solving weekly exercises at the Institute for Computer Science of Martin Luther University Halle-Wittenberg.¹ The class can be used by all students—especially first semesters—to typeset their exercises with a low-effort in beautiful \LaTeX . We include a bunch of handy macros that are used throughout many lectures during the bachelor’s degree program.

^{*}This document describes version v2.0, last revised 2020/11/12.

[†]Fachschaftsrat Mathematik/Informatik der Studierendenschaft der Martin-Luther-Universität Halle-Wittenberg K.d.ö.R., Von-Seckendorff-Platz 1, 06120 Halle (Saale), Germany

¹<https://uni-halle.de/>

2 Usage

`\documentclass` Load the `mLuexercise` class at the start of your preamble.

```
i \documentclass{mLuexercise}
```

Languages As in many classes, you can define your main document language. This will help \TeX in hyphenating words and structural texts (e.g., sections) are being translated automatically.

`english` The `english` option selects English language for texts and hyphenation.

`ngerman` The `ngerman` option selects German language (with new spelling) for texts and hyphenation.

While you do not have to specify a language, it is a meaningful information for writers (including yourself) to explicitly state the desired language that should be used consistently throughout the whole document. If no language is specified, English language is used.

`dataminingstyle` **Styles** The `dataminingstyle` option may be used for the “Data Mining” lecture and overwrites some mathematical symbols to match the lecture’s definition’s.

2.1 Exercise Metadata

Define the exercise’s metadata and your identity. The below macros should be used only in the preamble, that is before `\begin{document}`.

`\lecture` The `\lecture{<name>}` macro sets the name of the lecture you are writing exercises for.

`\semester` The semester is automatically set to the current semester. You can overwrite the default value with the `\semester{<semester>}` macro if you are compiling exercises for another semester.

`\exercise` The `\exercise{<number>}` macro sets the number of the exercise you are working on.

`\task` The `\task{<number>}` macro sets the number of the first task. This is useful if you submit single PDF files for each task within the exercise. If you omit this option, numbering starts at 1.

`\group` Sometimes tutors allow to submit exercises in groups. You can use the optional `\group{<number>}` macro to set the group number. If no group number is given, the group number is not displayed.

`\title` The `\title{<lecture name>}` macro is an alias for `\lecture{<lecture name>}`.

`\date` The date is automatically set to the current date. You can overwrite the default value with the `\date{<date>}` macro.

2.2 Student Metadata

The following commands should be used to include identification in your exercise in order to assign your work.

`\studentname` You must define your full name with the `\studentname{<full name>}` macro. If you are working in a group, you can enter more names separated with commas and/or line breaks.

`\studentnumber` The `\studentnumber{<matriculation number>}` macro specifies your student ma-

trication number (e.g., 234 567 890). This is the same number as on your student ID card.

`\studentsymbol` The `\studentsymbol{<shorthand symbol>}` macro specifies your shorthand symbol used for university IT services (e.g., abcde). This is the same username used for Stud.IP, university mail etc.

Both `\studentnumber` and `\studentsymbol` are optional. Though, most tutors require specifying either student number or symbol.

Multiple Students While you can use commas and line breaks in the above macros, we would suggest one of the following two options to submit work in groups with multiple students:

- Either use the services offered by the university to check-in your group members online (e.g., in the Institute for Computer Science’s “Übungsportal”). In this case you don’t need to specify multiple names in the preamble, but just your own name.
- Or, if you cannot specify group members elsewhere, we recommend to add a footnote on the first page. That way you can list all other students but do not waste too much paper.

2.3 Included Packages

The `mluexercise` class loads a number of useful \LaTeX packages listed in Table 1. Those are needed to typeset exercises during the Computer Science bachelor’s degree programme at Martin Luther University Halle-Wittenberg. We recommend reading the introductions of each package’s documentation on CTAN².

3 Design Goals

The `mluexercise` class should:

- be usable for first semester students with rather little \LaTeX experience,
- be consistent with Martin Luther University brand guidelines³, especially with respect to font families and colors, and
- include packages frequently needed by students.

4 Implementation

4.1 Setup

We specify the \LaTeX version, define and parse options and then load the base class `scrartcl`⁴ with all remaining options.

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{mluexercise}[2020/11/12 v2.0]
```

²<https://ctan.org/>

³<https://www.pr.uni-halle.de/download/logo/>

⁴<https://ctan.org/pkg/scrartcl>

Table 1: Packages included in the class.

Package	Purpose	Link
babel	hyphenation, localization	https://ctan.org/pkg/babel
amsmath	mathematics	https://ctan.org/pkg/amsmath
amsthm		https://ctan.org/pkg/amsthm
amssymb		https://ctan.org/pkg/amssymb
amstext		https://ctan.org/pkg/amstext
array		https://ctan.org/pkg/array
cancel		https://ctan.org/pkg/cancel
inputenc	UTF8 encoding	https://ctan.org/pkg/inputenc
fontenc	T1 encoding	https://ctan.org/pkg/fontenc
booktabs	tables	https://ctan.org/pkg/booktabs
graphicx	images, graphics	https://ctan.org/pkg/graphicx
xcolor	color definitions	https://ctan.org/pkg/xcolor
tikz	drawing vector graphics	https://ctan.org/pkg/tikz
pgfplots	plotting	https://ctan.org/pkg/pgfplots
algorithm2e	pseudocode, algorithms	https://ctan.org/pkg/algorithm2e
listings	code listings	https://ctan.org/pkg/listings
listingsutf8		https://ctan.org/pkg/listingsutf8
subcaption	sub-figures	https://ctan.org/pkg/subcaption
csquotes	quotation	https://ctan.org/pkg/csquotes

Options

```

3 \newif\ifdataminingstyle\dataminingstylefalse
4 \DeclareOption{dataminingstyle}{%
5   \dataminingstyletrue
6 }

```

Process options and load base class with remaining options.

```

7 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{scrartcl}}
8 \ProcessOptions*
9 \LoadClass{scrartcl}

```

To enable support for UTF8 and some other useful basics, we load a bunch of packages.

```

10 \RequirePackage[utf8]{inputenc}
11 \RequirePackage[T1]{fontenc}
12 \RequirePackage{ifthen} % Conditional branches and loops.
13 \RequirePackage{etoolbox} % Hooks for executing code.
14 \RequirePackage{hyperref} % Hyperlinks.
15 \RequirePackage{xcolor} % Color definitions.

```

As we'd like to be able to switch between English and German with proper hyphenation, load language support packages.⁵

```

16 \RequirePackage{babel}
17 \RequirePackage{iflang}
18 \newcommand{\IfGerman}[2]{\IfLanguagePatterns{german}{#1}{%
19   \IfLanguagePatterns{ngerman}{#1}{#2}}}

```

⁵If you'd like to add a language, please contact us.

4.2 Global Variables

The class can be configured with the lecture's and student's details. We define global variables for that and redefine some built in \LaTeX commands to ease the migration from standard classes.

```
20 \newcommand{\@checkoption}[3]{%
21   \AtEndPreamble{%
22     \ifthenelse{\equal{\the#1}{}}{%
23       \ClassError{mluexercise}{Missing #2}{%
24         Set #2 using the \protect#3 command.%
25       }%
26     }{}%
27   }%
28 }
29 \newtoks\@lecture
30 \newcommand{\lecture}[1]{\global\@lecture{#1}}
31 \let\title\lecture % Redefine standard \title command.
32 \@checkoption{\@lecture}{lecture name}{\lecture}
33 \newtoks\@semester
34 \newcommand{\semester}[1]{\global\@semester{#1}}
35 \global\@semester % Automatically set semester based on current date.
36   \ifnum\month<4 % Winter semester, including previous year.
37   WS~{\advance\year by -1 \the\year\advance\year by 1}/\the\year%
38   \else\ifnum\month<10 % Summer semester.
39   SS~\the\year%
40   \else % Winter semester, including next year.
41   WS~\the\year/{\advance\year by 1 \the\year\advance\year by -1}%
42   \fi\fi%
43 }
44 \newtoks\@exercise
45 \newcommand{\exercise}[1]{\global\@exercise{#1}}
46 \@checkoption{\@exercise}{exercise number}{\exercise}
47 \newtoks\@task
48 \newcommand{\task}[1]{\global\@task{#1}}
49 \global\@task{1}
50 \newtoks\@group
51 \newcommand{\group}[1]{\global\@group{#1}}
52 \global\@group{0}
53 \newtoks\@studentname
54 \newcommand{\studentname}[1]{\global\@studentname{#1}}
55 \let\author\studentname % Redefine standard \title command.
56 \@checkoption{\@studentname}{student name}{\studentname}
57 \newtoks\@studentnumber
58 \newcommand{\studentnumber}[1]{\global\@studentnumber{#1}}
59 \newtoks\@studentsymbol
60 \newcommand{\studentsymbol}[1]{\global\@studentsymbol{#1}}
```

4.3 Layout, Text

Set up a reasonable page layout and define text styles that comply with Martin Luther University brand guidelines.

```
61 \RequirePackage{calc}
62 \RequirePackage[
63   a4paper,
64   inner=2cm,
65   outer=2cm,
66   top=3cm,
67   bottom=3cm,
68   head=0.75cm,
69   headsep=0.25cm,
```

```

70     foot=0.75cm,
71 ]{geometry}
72 \renewcommand{\baselinestretch}{1.15}
73 \setlength{\parindent}{0em} % Disable paragraph indentation.
74 \setlength{\parskip}{1ex} % Instead enable paragraph margins.

```

Font Families We use Libertine as main font as that is the closest free font to the proprietary URW Classico font used by the university. For mathematics we use the more modern Euler Maths font and for source code the *true* monospace font Source Code Pro, as otherwise copying from the PDF is broken. For clarity reasons we do not want code ligatures.

```

75 \RequirePackage{libertine}
76 \RequirePackage{euclerm}
77 \RequirePackage[ttdefault]{sourcecodepro}
78 \RequirePackage{microtype}
79 \DisableLigatures{family=tt*}

```

Text Styles

```

80 \newcommand{\strong}[1]{\textbf{#1}}
81 \newcommand{\italic}[1]{\textit{#1}}
82 \newcommand{\code}[1]{\texttt{#1}}
83 % Double underline.
84 \newcommand{\Underline}[1]{\underline{\underline{#1}}}
85 % Abbreviated plural ("Lineare Algebra" lecture).
86 \newcommand{\plural}[1]{\textsuperscript{\underline{#1}}}
87 \newcommand{\pl}[1]{\plural{#1}}
88 \RequirePackage[autostyle=true,german=quotes]{csquotes}

```

URL / Link Font

```

89 \RequirePackage{relsize}
90 \newcommand{\ttsmallfont}{\ttfamily\smaller}
91 \renewcommand{\UrlFont}{\ttsmallfont}
92 \newcommand{\textttsmall}[1]{\ttsmallfont #1}
93 \newcommand{\query}[1]{\ttsmallfont #1}
94 \newcommand{\domain}[1]{\href{http://#1}{\mbox{\ttsmallfont #1}}}
95 \newcommand{\email}[1]{\href{mailto:#1}{\mbox{\ttsmallfont #1}}}

```

Headings

```

96 \setkomafont{sectioning}{\sffamily\mdseries}
97 \setkomafont{section}{\LARGE}
98 \setkomafont{subsection}{\Large}
99 \setkomafont{subsubsection}{\large}
100 \setkomafont{paragraph}{\large}
101 \setkomafont{subparagraph}{\normalsize}
102 \renewcommand{\thesection}{%
103     \bfseries\upshape \IfGerman{Aufgabe}{Task} \arabic{section}}
104 \renewcommand{\thesubsection}{%
105     \bfseries\upshape \alph{subsection}}
106 \renewcommand{\thesubsubsection}{%
107     \upshape (\roman{subsubsection})}
108 \renewcommand{\autodot}{}

```

Title

```

109 \newcommand{\Rom}[1]{\uppercase\expandafter{\romannumerals#1}\relax}
110 \newcommand{\groupstring}{\ifnum\the\@group>0{,
111     \IfGerman{Gruppe}{Group} \Rom{\the\@group}}\fi}

```

```

112 \author{}
113 \setkomafont{title}{\sffamily\bfseries\huge\centering}
114 \setkomafont{date}{\sffamily\large\centering}
115 \newlength{\apptitlewidth}
116 \renewcommand{\maketitle}{%
117   \settowidth{\apptitlewidth}{%
118     \usefontofkomafont{title}\the\@lecture}%
119   \ifthenelse{\lengthtest{\apptitlewidth>\textwidth}}{%
120     \addtokomafont{title}{\LARGE}}{%
121     \begin{center}%
122       \usefontofkomafont{title}\the\@lecture \\\
123       \usefontofkomafont{date}\@date, \the\@semester\groupstring
124     \end{center}
125 }

```

Head, Foot

```

126 \RequirePackage[headsepline,footsepline]{scrlayer-scrpage}
127 \RequirePackage{totpages}
128 \pagestyle{scrheadings}
129 \clearscrheadfoot
130 \setkomafont{pageheadfoot}{\sffamily}
131 \setkomafont{pagenumber}{\sffamily}
132 \tfoot{\thepage~von~\ref{TotPages}}

```

4.4 Mathematics

We rely on AMS packages for rendering mathematical equations, proofs, and symbols. Additionally we load packages for arrays in math mode and cancellations

```

133 \RequirePackage{amsmath}
134 \RequirePackage{amsthm}
135 \RequirePackage{amssymb}
136 \RequirePackage{amstext}
137 \RequirePackage{array}
138 \RequirePackage{cancel}

```

Now we define (more readable) macros for the mathematical symbols and functions most commonly used at Martin Luther University.

```

139 \newcommand{\union}{\cup}
140 \newcommand{\disjunction}{\uplus}
141 \newcommand{\intersection}{\cap}
142 \newcommand{\intersect}{\cap}
143 \newcommand{\infinity}{\infty}
144 \newcommand{\corresponds}{\triangleq}

145 \newcommand{\C}{\mathbb{C}} % Complex numbers.
146 \newcommand{\complexnumbers}{\C}
147 \newcommand{\R}{\mathbb{R}} % Real numbers.
148 \newcommand{\realnumbers}{\R}
149 \newcommand{\Q}{\mathbb{Q}} % Rational numbers.
150 \newcommand{\rationalnumbers}{\Q}
151 \newcommand{\Z}{\mathbb{Z}} % Whole numbers.
152 \newcommand{\wholenumbers}{\Z}
153 \newcommand{\N}{\mathbb{N}} % Natural numbers.
154 \newcommand{\naturalnumbers}{\N}
155 \newcommand{\B}{\mathbb{B}} % Binary numbers.
156 \newcommand{\binarynumbers}{\B}

157 % Equivalence transformation
158 \newcommand{\eqtransform}{\ensuremath{\quad\big|\,,\,}}
159 % "Ditto" sign

```

```

160 \newcommand{\ditto}{\textquotedbl} \newcommand{\dito}{\ditto}
161 % End of proof: "quod erat demonstrandum"
162 \renewcommand{\qed}{\nopagebreak\hfill\ensuremath{\square}}
163 \newcommand{\mland}{\(\land\)} % \land in text.
164 \newcommand{\mlor}{\(\lor\)} % \lor in text.

```

Many maths symbols can have alternatives for stylistic choices. We enable the variants most liked by our tutors.

```

165 \let\tmp\mod \let\mod\bmod \let\bmod\tmp
166 \let\vareemptyset\emptyset \let\emptyset\vareemptyset
167 \let\epsilon\epsilon \let\epsilon\varepsilon \let\varepsilon\epsilon
168 \let\phi\phi \let\phi\varphi \let\varphi\phi

```

For some specific lectures we provide more detailed macros for symbols and functions.

Lecture “Lineare Algebra”

```

169 \newcommand{\base}[1]{\mathcal{#1}} % Base (caligraphic)
170 \DeclareMathOperator{\im}{im} % Image
171 \DeclareMathOperator{\id}{id} % Identity
172 \DeclareMathOperator{\sel}{sel} % Selection
173 \DeclareMathOperator{\dom}{dom} % Domain
174 \DeclareMathOperator{\ran}{ran} % Range
175 \DeclareMathOperator{\Hom}{Hom} % Homomorphism
176 \DeclareMathOperator{\End}{End} % Endomorphism

```

Lecture “Datenstrukturen und effiziente Algorithmen”

```

177 \renewcommand{\O}{\mathcal{O}} % asymptotic O-Notation (Landau)
178 \DeclareMathOperator{\indeg}{indeg} % Indegree
179 \DeclareMathOperator{\outdeg}{outdeg} % Outdegree

```

Lecture “Einführung in Data Science”

```

180 \renewcommand{\P}{\ifdataminingstyle p\else\mathbf{P}\fi}
181 \newcommand{\E}{\ifdataminingstyle\mathbb{E}\else\mathbf{E}\fi}
182 \DeclareMathOperator{\var}{var}
183 \DeclareMathOperator{\Var}{Var}
184 \DeclareMathOperator{\cov}{cov}
185 \DeclareMathOperator{\Cov}{Cov}
186 \DeclareMathOperator{\Bin}{Bin}
187 \DeclareMathOperator{\Exp}{Exp}
188 \DeclareMathOperator{\Dir}{Dir}
189 \DeclareMathOperator{\Mult}{Mult}
190 \newcommand{\Normal}{\mathcal{N}}
191 \newcommand{\Norm}{\Normal}

```

Table Columns The handy tabular column definitions below can be used to typeset a whole column in math mode, to avoid repetitive opening/closing brackets.

```

192 \newcolumnntype{L}{>{\(}l<{\)} }
193 \newcolumnntype{R}{>{\(}r<{\)} }
194 \newcolumnntype{C}{>{\(}c<{\)} }

```

Calculus Environments Calculus environments are currently work in progress, subject to change, and may not work as expected. However, they can simplify writing logical consequences in the “Mathematische Grundlagen der Informatik und Konzepte der Modellierung” lecture.


```

195 \newcounter{calculusRowCount}
196 \RequirePackage{pgfkeys}
197 \newenvironment{calculus}[1]{
198 \pgfkeys{/mlu/calculus/.cd,show index=false,
199   context=\Gamma,context command=context,#1}
200 \setcounter{calculusRowCount}{0}
201 \newcommand{\calculusSymbol}{\text{
202   \sffamily\itshape\pgfkeysvalueof{/mlu/calculus/symbol}}}
203 \newcommand{\calculusContext}{\ensuremath{
204   \pgfkeysvalueof{/mlu/calculus/context}}}
205 \expandafter\let\csname \pgfkeysvalueof{/mlu/calculus/context command}%
206   \endcsname\calculusContext
207 \par\vspace{0.5em}
208 \begin{minipage}{\textwidth}\begin{tabular}{
209   @{\stepcounter{calculusRowCount}
210   (\arabic{calculusRowCount})\hspace{1em}} R
211   @{\hspace{0.4em}
212   \left(
213     \vdash_{\%
214       \ifthenelse{\%
215         \equal{\pgfkeysvalueof{/mlu/calculus/show index}}{true}
216         }{
217           \ifthenelse{\%
218             \equal{\pgfkeysvalueof{/mlu/calculus/symbol}}{}}{\%
219             }{\%
220               \calculusSymbol\%
221             }{\%
222               }{\%
223                 \hspace{-0.1em}\%
224               }{\%
225                 }{\%
226               }\hspace{0.6em}}
227             L l
228           }
229 }{
230 \end{tabular}\end{minipage}\vspace{0.5em}
231 \let\calculusContext\undefined \let\calculusSymbol\undefined
232 \expandafter\let\csname \pgfkeysvalueof{/mlu/calculus/context command}%
233   \endcsname\undefined
234 }
235 \newenvironment{eqcalc}[1][\begin{calculus}[
236   symbol=E,show index=true,context={\calculusSymbol_{#1}},
237   context command=E]{} \end{calculus}] % Equation calculus
238 \newenvironment{seqcalc}{\begin{calculus}[
239   symbol=S,show index=true, context={\calculusSymbol},
240   context command=seq]{} \end{calculus}] % Sequence calculus

```

4.5 Algorithms, Pseudocode

```

241 \RequirePackage{vlined,linesnumbered}[algorithm2e]
242 \DontPrintSemicolon % Hide semicolons.
243 \SetKwProg{Function}{function}{\ is}{end function}
244 \SetKwComment{Comment}{\quad\(\triangleright\)\~{}} % Comment style.
245 \SetCommentSty{itshape} % Comment font.
246 \SetKw{Continue}{continue}
247 \SetKwBlock{Repeat}{repeat}{}
248 \SetNlSty{tiny}{} % Line number font.
249 \SetNlSkip{0.5em} % Line number skip.
250 \SetAlgoNlRelativeSize{0}
251 \SetAlFnt{\footnotesize}

```

4.6 Code Listings

For syntax highlighting and including source code listings, we use the `listings` package. With `listingsutf8` we can include listings that contain Unicode characters.

```
252 \RequirePackage{listings}
253 \RequirePackage{listingsutf8} % UTF8 support in included listings.
```

Define colors for syntax highlighting.

```
254 \definecolor{lsnumber}{rgb}{0,0,0} % Zeilennummerfarbe
255 \definecolor{lscomment}{rgb}{0.25,0.5,0.35} % Kommentarfärbefarbe
256 \definecolor{lskeyword}{rgb}{0.5,0,0.35} % Schlüsselwörterfarbe
257 \definecolor{lsstring}{rgb}{0.6,0,0} % Zeichenkettenfarbe
```

The default listing style below is enabled automatically and should guarantee consistency with the appearance of pseudocode (see Section 4.5).

```
258 \lstset{
259     language=C,
260     basicstyle=\ttfamily,
261     breakatwhitespace=false,
262     breaklines=true,
263     prebreak={\mbox{\footnotesize\(\hookrightarrow\)}},
264     numbers=left,
265     numberstyle=\color{lsnumber}\tiny,
266     numbersep=0.5em,
267     stepnumber=1,
268     commentstyle=\color{lscomment},
269     morecomment=[s][\color{lscomment}]{/**}{*/},
270     keepspaces=true,
271     keywordstyle=\bfseries\color{lskeyword},
272     stringstyle=\color{lsstring},
273     showtabs=false, showspaces=false,
274     showstringspaces=false,
275     tabsize=2,
276 }
```

Haskell Language Definition Refine the Haskell language definition and code style for use in the “Konzepte der Programmierung” lecture.

```
277 \lstdefinlanguage[Zimmermann]{haskell}[]{}{haskell}{
278     escapeinside={*'}{'*},
279     showstringspaces=false,
280     morecomment=[l]\%,
281     captionpos=b,
282     emphstyle={\bfseries},
283 }
284 \lstalias[]{}{zhaskell}[Zimmermann]{haskell}
285 % Deprecated. Use 'language=zhaskell' instead of 'style=haskell'.
286 \lstdefinestyle{haskell}{language=zhaskell}
```

Assembler Language Definition Introduce a new language definition for Prof. Molitor’s Assembler dialect used in “Einführung in Rechnerarchitektur”.

```
287 \lstdefinlanguage[Molitor]{Assembler}[x86masm]{Assembler}{
288     morekeywords={
289         ldd,sto,shl,shr,rol,ror,sub,add,shli,shri,roli,rori,
290         subi,addi,or,and,xor,xnor,jmp,beq,bneq,bgt,bo,ldpc,stpc
291     },
292     comment=[l]{\#},
293 }
294 \lstalias[]{}{massembler}[Molitor]{Assembler}
```

```

295 % Deprecated. Use 'language=massembler' instead of 'style=massembler'.
296 \lstdefinestyle{massembler}{language=massembler}

```

4.7 Graphics, Drawing, Plots

We add packages for including images and graphics, for drawing vector graphics, and for plotting data or functions.

```

297 \RequirePackage{booktabs}
298 \RequirePackage{graphicx}
299 \RequirePackage{float}
300 \RequirePackage{subcaption}
301 \RequirePackage{tikz}
302 \RequirePackage{pgfplots}
303 \RequirePackage{rotating}
304 \usetikzlibrary{positioning}
305 \usetikzlibrary{automata}
306 \usetikzlibrary{trees}
307 \tikzset{
308     >=latex,
309     font=\sffamily,
310 }
311 \pgfplotsset{compat=1.16}

```

4.8 Document Hooks

The following \LaTeX code should be inserted just before `\begin{document}`.

```
312 \AtEndPreamble{
```

Update exercise and task number as specified in the preamble. (Set first section number to task number.)

```

313     \setcounter{section}{\the\@task} \addtocounter{section}{-1}
314     \newcommand{\@exercisestring}{\IfGerman{%
315         \the\@exercise.~Übungsserie}{Exercise~\the\@exercise}}

```

Set up page head/foot with metadata.

```

316     \ihead{\the\@studentname}
317     \chead{\textbf{\@exercisestring}}
318     \ohead{
319         \the\@studentnumber%
320         \ifthenelse{equal{\the\@studentnumber}{}} \OR
321             \equal{\the\@studentsymbol}{}}{\ / \ ,}%
322     \the\@studentsymbol%
323     }

```

Set up PDF metadata.

```

324     \hypersetup{
325         pdfauthor={\the\@studentname},
326         pdftitle={\@exercisestring - \the\@lecture}
327     }
328 }

```