cesenaexam — class file to typeset exams*

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Released 2017/08/03

Contents

1 How to make 1

2 The cesenaexam document class 1

3 The cesenaexam package 2

4 Class and package settings and definitions 2

5 Defined Macros 5

6 Change History 9

7 Index 9

1 How to make

This class is also provided with a Makefile and an example document.

Just execute the Makefile with `make` and the class file `cesenaexam.cls`, the package file `cesenaexam.sty`, this manual `cesenaexam.pdf` and the example document `cesenaexam_example.pdf` will be produced.

2 The cesenaexam document class

```
\documentclass[a4paper, 10pts]{cesenaexam}
```

The document class for the `cesenaexam`, which has few additional optional arguments listed in the following:

*This file describes version v0.2, last revised 2017/08/03.

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- [⟨*boxed*⟩]: Draws boxes around blocks. The red box is the tikz bounding box, the black one is the minipage bounding box. Useful for the layout of the page.
- [⟨*times*⟩]: Sets a times font.
- [⟨*noversion*⟩]: Hides the footer.
- [⟨*left=2cm, right=2cm, top=2.5cm, bottom=2.5cm*⟩]: Set the page margins using the geometry package, the defaults are indicated here in the options.

3 The cesenaexam package

```
\usepackage{cesenaexam}
```

Not intended to be used with the class which already defines all the macros

All the macros are defined also without the class in a standalone package, which is used to make this manual. There could be other uses, but those are not guaranteed.

4 Class and package settings and definitions

In both cesenaexam.cls and cesenaexam.sty.

```
%% Custom options
\RequirePackage{etoolbox}
%% I decided to use the etoolbox ifbool because the if else fi
%% has issues with docstrip and needs a dirty hack
%% tex.stackexchange.com/questions/162762
%% No version option
\newbool{exam@version}\booltrue{exam@version}
%% Box the blocks option
\newbool{exam@boxed}\boolfalse{exam@boxed}
%% Times font option
\newbool{exam@times}\boolfalse{exam@times}
```

Only in cesenaexam.cls.

```
%% No version option
\DeclareOption{noversion}{\boolfalse{exam@version}}
%% Box the blocks option
\DeclareOption{boxed}{\booltrue{exam@boxed}}
%% Times font option
\DeclareOption{times}{\booltrue{exam@times}}
%% This class extends the article class
%% Read all the documentclass options; pass them to article,
\DeclareOption*{\PassOptionsToClass{\CurrentOption}{article}}
\ProcessOptions \relax
%%
```

```
\LoadClass{article}
%%
\RequirePackage{pgfkeys}
\RequirePackage{pgfopts}
%%
%% Options to pass to geometry using pgfopts
\pgfkeys{
 /myexamgeometry/.is family, /myexamgeometry,
 left/.default = 2cm,
 right/.default = 2cm,
 top/.default = 2.5cm,
 bottom/.default = 2.5cm,
 left/.store in =\exam@geometryleft,
 right/.store in =\exam@geometryright,
 top/.store in =\exam@geometrytop,
 bottom/.store in =\exam@geometrybottom,
 left, right, bottom, top,
}
\ProcessPgfOptions{/myexamgeometry}
%%
%% Page layout, check if the boxed option is used to load
%% geometry with the showframe option
\ifbool{exam@boxed}{%
\RequirePackage[showframe,%
left=\exam@geometryleft, right=\exam@geometryright,%
top=\exam@geometrytop,bottom=\exam@geometrybottom]{geometry}%
}{%
\RequirePackage[left=\exam@geometryleft, right=\exam@geometryright,%
top=\exam@geometrytop, bottom=\exam@geometrybottom]{geometry}%
}
%%
%% Set the times font if the option is times
\ifbool{exam@times}{%
\RequirePackage{newtxtext,newtxmath}%
}{}
```

In both `cesenaexam.cls` and `cesenaexam.sty`.

```
%% Loading graphicx before tikz removes a
%% strange issue with the \graphicspath
\RequirePackage[pdftex]{graphicx}
%% Tikz and circuitikz
\RequirePackage{tikz}
\RequirePackage[betterproportions]{circuitikz}
\usetikzlibrary{arrows.meta,arrows,intersections,%
positioning,fit,calc,through,babel}
\usetikzlibrary{decorations.pathmorphing,backgrounds}
%% Some settings for Tikz
\tikzset{switcharc/.style={draw, thick, >=stealth},
    every picture/.append style={tight background,%
    baseline={([yshift=-1em] current bounding box.north)}}}
```

Only in cesenaexam.cls.

```
%% Set the Header
\RequirePackage{fancyhdr}
\renewcommand{\headrulewidth}{0pt}
\setlength{\headheight}{25pt}
\addtolength{\headheight}{\baselineskip}
\fancypagestyle{plain}{
\fancyhead[C]{
\ifbool{exam@boxed}{%
\tikzset{every picture/.style={framed, tight background},%
background rectangle/.style={draw=red}}%
}{}
\begin{tikzpicture}
\node (header) [align=center] at (0,0) {\@title};
\end{tikzpicture}%
}%
\ifbool{exam@version}{%
\fancyfoot[L]{{\it Proudly made with} \LaTeX}%
\fancyfoot[R]{CesenaExam v\cesenaexamversion { }- {\it A. Pacini}}%
}{}
}
\pagestyle{plain}
```

In both cesenaexam.cls and cesenaexam.sty.

```
%% Redefine the section to have bigger font and to be
%% delimited between two lines
\RequirePackage{titlesec}
\newcommand{\sectionfont}{\Large}
\renewcommand\thesection{\bfseries \arabic{section}}
\titleformat{\section}
    {\titlerule
     \vspace{0.5ex}%
     \sectionfont}
    {\thesection}{1em}
    {\sectionfont \bfseries}[\titlerule]
%% Redefine the enumerate item to be bold
\renewcommand\labelenumi{\bfseries\theenumi.}
%% Options for the titlebox processed from the
%% maketitle optional arguments
\pgfkeys{
 /mytitlebox/.is family, /mytitlebox,
 textboxheight/.default = 0.6cm,
 whiteboxheight/.default = 1cm,
 textboxheight/.store in = \minheighttext@title,
 whiteboxheight/.store in = \minwhiteboxheight@title,
 textboxone/.default = {\relax},
 textboxtwo/.default = {\relax},
 textboxthree/.default = {\relax},
 textboxfour/.default = {\relax},
 textboxone/.store in = \textboxone@title,
```

```
118 textboxtwo/.store in = \textboxtwo@title,
119 textboxthree/.store in = \textboxthree@title,
120 textboxfour/.store in = \textboxfour@title,
121 %% Executing them to assign the default value
122 %% (Tikz manual 82.3.2 or tex.stackexchange.com/questions/85754)
123 textboxheight, whiteboxheight, textboxone,
124 textboxtwo, textboxthree, textboxfour,
125 }
```

5 Defined Macros

`\examsection` Usage: `\examsection{`⟨*bold title*⟩`}{`⟨*italic text*⟩`}`
Prints the title between two lines **with** numbering.

`\examsection*` Usage: `\examsection*{`⟨*bold title*⟩`}{`⟨*italic text*⟩`}`
Prints the title between two lines **without** numbering.

Definition of `\examsection` and `\examsection*`:

```
126 %% Define examsection and examsection*
127 \def\examsection{\@ifstar\@examsection\@@examsection}
128 \def\@examsection#1#2{\section*{#1 \textmd{(\textit{#2})}}\noindent}
129 \def\@@examsection#1#2{\section{#1 \textmd{(\textit{#2})}}\noindent}
```

`\boxempty` Usage: `\boxempty` → □
Prints an empty box.
Definition of `\boxempty`:

```
130 %% Definition of empty tick box
131 \newcommand{\boxempty}{$ \square \;$}
```

`\boxcheck` Usage: `\boxcheck` → ■
Prints a black or *checked* box.
Definition of `\boxcheck`:

```
132 %% Definition of empty tick box
133 \newcommand{\boxcheck}{$ \blacksquare \;$}
```

`\examparts` Usage: `\examparts{`⟨⟩`}`

```
\examparts{\bfseries Parts done: \hspace{1cm}%
   E1 \boxempty \hspace{1cm}%
   E2 \boxempty \hspace{1cm}%
   D \boxempty}
```

Used to include the checkboxes in `\maketitle` by passing the code to the `\examparts{}` macro. It is internally assigned to the variable `\ex@parts`.
Definition of `\examparts{}`:

```
134 %% Assigns to ex@parts what is passed to the function examparts{}.
135 %% Works similarly similarly to author{}
136 \def\examparts#1{\def\ex@parts{#1}}
```

`\maketitle` Usage: `\maketitle[`⟨*opt. args*⟩`]{`⟨*Surname*⟩`}{`⟨*Name*⟩`}{`⟨*Id*⟩`}{`⟨*Signature*⟩`}{`⟨*N*⟩`}`
Redefines the `\maketitle`.
The mandatory arguments label the text (or top) boxes, where the last one used to give the exam type using one char or number. It is also possible to give optional arguments:

- `[`⟨*textboxheight=0.6cm, whiteboxheight=1cm*⟩`]`: To set the height of the textboxes (`textboxheight`) and of the whiteboxes (`whiteboxheight`), the defaults are indicated here in the options;
- `[`⟨*textboxone=Guglielmo, textboxtwo=Marconi, textboxthree=000, textboxfour=Signature.pdf*⟩`]`: To fill the whiteboxes, default are empty.

A usage example is:

```
\maketitle[textboxheight=0.6cm, whiteboxheight=1cm,%
   textboxone={Guglielmo}, textboxtwo={Marconi}, textboxthree={00000000},%
   textboxfour={\includegraphics[width=3cm]{Guglielmo_Marconi_Signature}}]%
   {Cognome}{Nome}{Matricola}{Firma}{1}
```

`\maketitle*` Not implemented at the moment.

Definition of `\maketitle` and `\maketitle*`:

```
%% Redefine maketitle
%% Just for a future starred version
\def\maketitle{\@ifstar\make@@title\make@title}%
%% Define the unstarred version maketitle (make@title)
\newcommand\make@title[6][]{%
 \pgfkeys{/mytitlebox, #1}%
 \make@@@title{#2}{#3}{#4}{#5}{#6}}%
%% Define the common command
\def\make@@@title#1#2#3#4#5{%
\ifbool{exam@boxed}{%
\tikzset{every picture/.append style={framed},%
background rectangle/.style={draw=red}}}{}%
\begin{center}%
\begin{tikzpicture}%
\pgfmathsetmacro{\boxlen}{(\textwidth-1.6cm)/4}%
\pgfmathsetmacro{\lastboxlen}{\textwidth - 4*\boxlen - 1mm}%
\node (surname) [draw, align=center, minimum width=\boxlen,%
minimum height = \minheighttext@title] at (0,0) {\bf #1};%
\node (surname box) [draw, anchor=north, minimum width=\boxlen,%
minimum height = \minwhiteboxheight@title] at%
($(surname.south)+(0,\pgflinewidth)$) {\textboxone@title};%
\node (name) [draw, align=center, right=0 and -\pgflinewidth of surname,%
minimum width=\boxlen, minimum height = \minheighttext@title] {\bf #2};%
\node (name box) [draw, anchor=north, minimum width=\boxlen,%
minimum height = \minwhiteboxheight@title] at%
($(name.south)+(0,\pgflinewidth)$) {\textboxtwo@title};%
```

```
\node (id) [draw, align=center, right=0 and -\pgflinewidth of name,%
minimum width=\boxlen, minimum height = \minheighttext@title] {\bf #3};%
\node (id box) [draw, anchor=north, minimum width=\boxlen,%
minimum height = \minwhiteboxheight@title] at%
($(id.south)+(0,\pgflinewidth)$) {\textboxthree@title};%
\node (signature) [draw, align=center, right=0 and -\pgflinewidth of id,%
minimum width=\boxlen, minimum height = \minheighttext@title] {\bf #4};%
\node (signature box) [draw, anchor=north, minimum width=\boxlen,%
minimum height = \minwhiteboxheight@title] at%
($(signature.south)+(0,\pgflinewidth)$) {\textboxfour@title};%
%%
\pgfmathsetmacro{\minheighttypebox}{\minheighttext@title +%
\minwhiteboxheight@title}%
\node (examtype) [draw, align=center, anchor=north west,%
minimum width=\lastboxlen, minimum height = \minheighttypebox] at%
($(signature.north east)+(-\pgflinewidth,0)$) {\Huge \bfseries #5};%
\node (checkboxes) [align=left, anchor=north west] at%
(surname box.south west) {\ex@parts};%
\end{tikzpicture}%
\end{center}%
}
```

`\examtwoblocks` Usage: `\examtwoblocks{`⟨*B1 length*⟩`}{`⟨*B2 length*⟩`}{`⟨*B1*⟩`}{`⟨*B2*⟩`}`
Defines the macro `\examtwoblocks`.
The mandatory arguments are the lenght of the first block and of the second block, and their content, respectively. They two boxes are vertically aligned to their centre.

Definition of `\examtwoblocks`:

```
%% Macro for two blocks centre aligned
\def\examtwoblocks#1#2#3#4{%
\noindent%
\begin{minipage}[c]{#1}\flushleft#3\end{minipage}%
\hfill%
\begin{minipage}[c]{#2}#4\end{minipage}
\par\vspace{5mm}\noindent%
}
\def\examtwoblocks@box#1#2#3#4{%
\noindent%
\tikzset{every picture/.append style={framed},
    background rectangle/.style={draw=red}}%
\let\bak@fboxsep\fboxsep%
\def\fboxsep{0pt}%
\fbox{\begin{minipage}[c]{#1}\flushleft#3\end{minipage}}%
\hfill%
\fbox{\begin{minipage}[c]{#2}#4\end{minipage}}%
\let\fboxsep\bak@fboxsep%
\par\vspace{5mm}\noindent%
}
\ifbool{exam@boxed}{%
```

```
\renewcommand{\examtwoblocks}{\examtwoblocks@box}}{}
```

`\examtwoblockstop` Usage: `\examtwoblockstop{`⟨*B1 length*⟩`}{`⟨*B2 length*⟩`}{`⟨*B1*⟩`}{`⟨*B2*⟩`}`
Defines the macro `\examtwoblockstop`.
The mandatory arguments are the lenght of the first block and of the second block, and their content, respectively. They two boxes are vertically aligned to their top, which is useful if used inside an itemize or an enumerate environment.

Definition of `\examtwoblockstop`:

```
%% Macro for two blocks top aligned
\def\examtwoblockstop#1#2#3#4{%
\noindent%
\begin{minipage}[t]{#1}\flushleft#3\end{minipage}%
\hfill%
\begin{minipage}[t]{#2}\flushright#4\end{minipage}%
}
\def\examtwoblockstop@box#1#2#3#4{%
\noindent%
\tikzset{every picture/.append style={framed},
    background rectangle/.style={draw=red}}%
\let\bak@fboxsep\fboxsep%
\def\fboxsep{0pt}%
\fbox{\begin{minipage}[t]{#1}\flushleft#3\end{minipage}}%
\hfill%
\fbox{\begin{minipage}[t]{#2}\flushright#4\end{minipage}}%
\let\fboxsep\bak@fboxsep%
}
\ifbool{exam@boxed}{%
\renewcommand{\examtwoblockstop}{\examtwoblockstop@box}}{}
```

`\examoneblocktop` Usage: `\examoneblocktop{`⟨*B length*⟩`}{`⟨*B*⟩`}`
Defines the macro `\examoneblock`.
The mandatory arguments are the lenght of the block and its content. They box is vertically aligned to its top, which is useful if used inside an itemize or an enumerate environment.

Definition of `\examoneblock`:

```
%% Macro for one block top aligned
\def\examoneblocktop#1#2{%
\noindent%
\begin{minipage}[t]{#1}\flushleft#2\end{minipage}}%
\def\examoneblocktop@box#1#2{%
\noindent%
\tikzset{every picture/.append style={framed},
    background rectangle/.style={draw=red}}%
\let\bak@fboxsep\fboxsep%
\def\fboxsep{0pt}%
\fbox{\begin{minipage}[t]{#1}\flushleft#2\end{minipage}}%
\let\fboxsep\bak@fboxsep%
}
\ifbool{exam@boxed}{%
```

```
240 \renewcommand{\examoneblocktop}{\examoneblocktop@box}}{}
```

6 Change History

v0.2

General: First public release 1

7 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

B

\boxcheck 132
\boxempty 130

E

\examoneblocktop . . 226
\examparts 134
\examsection *5*
\examsection* *5*
\examtwoblocks 184
\examtwoblockstop . . 206

M

\maketitle *6*
\maketitle* *6*