The camel package (v1.0)

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The `camel` package provides tools for typesetting lecture notes and provides an interface to the `camel` and `latextree` document processing systems.

1 Introduction

This package provides commands for typesetting lecture notes in various formats, and mimics some macros and environments from `exam.cls` for setting questions and answers, including multiple choice and multiple answer questions. The package also provides a standard interface to the `latextree` and `camel` python packages.

The most recent version of the package can be found at

`https://github.com/cardiffmaths/texmf/ttex/latex/camel`

2 Options

The following options are available.

`proofs`	proofs included (default).
`noproofs`	proofs excluded.
`blankoproofs`	blank box (for partial handouts).
`answers`	answers included (default).
`noanswers`	answers excluded.
`blankanswers`	blank box (for partial handouts).

3 Macros

`\blankon` Switch blank mode on.
`\blankoff` Switch blank mode off.
`\setproofcolour` Set the proof colour.
`\setsolutioncolour` Set the solution colour.

`\setanswercolour` Set the answer colour.
`\setscalefactor` blah
`\setscaleimages` blah

4 Environments

`blankbox` The contents of a `blankbox` environment will be replaced by an empty box whose height to equal the height of the (hidden) contents multiplied by `\stretchfactor`.
`proof` blah
`solution` blah
`answer` blah

5 Questions and Answers

The package modifies some of the macros and environments found in `exam.cls` for defining different types of question, including multiple choice and multiple answer questions.

`questions` A list environment for questions.
`\question` Item type for the `questions` list environment.
`parts` A list environment for parts of a question. These can an only be defined within a `\question` item.
`\part` Item type for the `parts` list environment.
`answer` An environment for answers.
`\ans` A macro for short answers (wrapper for an `answer` environment).

6 Implementation

6.1 Declare options and load packages

Declare and process options

```
\newif\if@noproofs\@noproofsfalse
\DeclareOption{noproofs}{\@noproofstrue}
\newif\if@blankproofs\@blankproofsfalse
\DeclareOption{blankproofs}{\@blankproofstrue}

\newif\if@nosolutions\@nosolutionsfalse
\DeclareOption{nosolutions}{\@nosolutionstrue}
\newif\if@blanksolutions\@blanksolutionsfalse
\DeclareOption{blanksolutions}{\@blanksolutionstrue}

\newif\if@noanswers\@noanswersfalse
\DeclareOption{noanswers}{\@noanswerstrue}
\newif\if@blankanswers\@blankanswersfalse
\DeclareOption{blankanswers}{\@blankanswerstrue}

```

```
\newif\if@blanktext\@blanktextfalse
\DeclareOption{blanktext}{\@blanktexttrue}

\newif\if@blankimages\@blankimagesfalse
\DeclareOption{blankimages}{\@blankimagestrue}
\newif\if@blankallimages\@blankallimagesfalse
\DeclareOption{blankallimages}{\@blankallimagestrue}

\newif\if@student\@studentfalse
\DeclareOption{student}{%
\@noanswerstrue
\@blankproofstrue
\@blanksolutionstrue
\@blanktexttrue
\@blankimagestrue
}
\ProcessOptions
\relax
```

Type out some useful information

```
\typeout{----------------------}
\if@noproofs\typeout{No Proofs}\fi
\if@noanswers\typeout{No Answers}\fi
\if@blankproofs\typeout{Blank Proofs}\fi
\if@blanksolutions\typeout{Blank Solutions}\fi
\typeout{----------------------}
```

Load all required packages

```
\RequirePackage{amsmath,amsfonts,amssymb}
\RequirePackage[dvipsnames]{xcolor}
\RequirePackage{newfloat}
\RequirePackage{caption}
\RequirePackage{graphicx}
\RequirePackage{tikz}
\RequirePackage{comment}
\RequirePackage{environ}
\RequirePackage{setspace}
\RequirePackage{etoolbox}
\RequirePackage{tcolorbox}
\tcbuselibrary{breakable}
\tcbuselibrary{skins}
```

Set entity names (override these with culang.sty)

```
\let\proofname\@undefined
\newcommand{\proofname}{Proof}
\newcommand{\questionname}{Question}
\newcommand{\answername}{Answer}
\newcommand{\solutionname}{Solution}
\newcommand{\quizname}{Quiz}
\newcommand{\responsename}{Response}
```

6.2 Colours

Set default colours

```
\newcommand{\camel@HideColour}{white}
\newcommand{\camel@TextColour}{black}
\newcommand{\camel@ShowColour}{black}
\newcommand{\camel@ProofColour}{black}
\newcommand{\camel@SolutionColour}{black}
\newcommand{\camel@AnswerColour}{black}
\newcommand{\camel@ResponseColour}{black}
\newcommand{\camel@NextColour}{black}
\AtBeginDocument{
\color{\camel@TextColour}
}
```

Commands for setting custom colours

```
\newcommand{\hidecolour}[1]{\renewcommand{\camel@HideColour}{#1}}
\newcommand{\textcolour}[1]{\renewcommand{\camel@TextColour}{#1}}
\newcommand{\showcolour}[1]{\renewcommand{\camel@ShowColour}{#1}}
\newcommand{\proofcolour}[1]{\renewcommand{\camel@ProofColour}{#1}}
\newcommand{\solutioncolour}[1]{\renewcommand{\camel@SolutionColour}{#1}}
\newcommand{\answercolour}[1]{\renewcommand{\camel@AnswerColour}{#1}}
\newcommand{\responsecolour}[1]{\renewcommand{\camel@ResponseColour}{#1}}
```

6.3 Show/Hide

`\hideon` `\hideoff`

Basic show/hide commands and aliases

```
\newcommand{\hideon}{
\if@blankimages
\@blankimagesnowtrue
\@blanktikz
\fi
\color{\camel@NextColour}
}
\newcommand{\hideoff}{
\if@blankallimages
\null
\else
\@blankimagesnowfalse
\@fixtikz
\fi
}
\newcommand{\blankson}{\hideon}
\newcommand{\blanksoff}{\hideoff}
```

6.4 Boxes

`\setstretchfactor`

Set stretch factor for blank boxes. This parameter is passed to the `\setstretch` command of the `setspace` package.

```
\newcommand{\camel@StretchFactor}{1}
\newcommand{\setstretchfactor}[1]{\renewcommand{\camel@StretchFactor}{#1}}
```

`camelbox` The basic box. This implements show/hide via `\hideon` and `\hideoff`.

```
\newcommand{\camelboxtitle}{}
\newenvironment{camelbox}{%
\par
\vspace*{\parskip}
\hideon
\begin{tcolorbox}[
breakable,
notitle,
boxrule=0.5pt,
colback=white,
before={\@fixtikz},
after={\hideoff},
coltext={\camel@NextColour},
skin=enhanced,
height fixed for = first and middle,
ignore nobreak
]
\textcolor{\camel@TextColour}{\noindent\camelboxtitle}
\begingroup
}{
\endgroup
\hideoff
\end{tcolorbox}
}
\AfterEndEnvironment{camelbox}{\hideoff}
```

`solution` Solution box. Can be visible, blank or invisible.
Solutions are associated with *examples*.
(Answers are associated with questions, see below.)
Implements `nosolutions` using the `comment` package.

```
\if@nosolutions
\excludecomment{solution}
\else
\newcommand{\solutiontitle}{\noindent\textbf{\solutionname:}\enspace}
\newenvironment{solution}{
\renewcommand{\camelboxtitle}{\solutiontitle}
\if@blanksolutions
\renewcommand{\camel@NextColour}{\camel@HideColour}
\setstretch{\camel@StretchFactor}
\else
\renewcommand{\camel@NextColour}{\camel@SolutionColour}
\setstretch{1}
\fi
\begin{camelbox}
}{
```

```
\end{camelbox}
}
\fi
```

`proof` Proof box. Can be visible, blank or invisible.
Proofs are associated with *theorems*.
Implements `noproofs` using the `comment` package. Implements `blankproofs` by changing text colour. Any existing proof environment (e.g. from amsthm) are killed first.

```
\let\proof\@undefined
\let\endproof\@undefined
\if@noproofs
\excludecomment{proof}
\else
\newcommand{\prooftitle}{\noindent\textbf{\proofname:}\enspace}
\newenvironment{proof}{
\renewcommand{\camelboxtitle}{\prooftitle}
\if@blankproofs
\renewcommand{\camel@NextColour}{\camel@HideColour}
\else
\renewcommand{\camel@NextColour}{\camel@ProofColour}
\fi
\begin{camelbox}
}{
\end{camelbox}
}
\fi
```

`blankbox` Blank box. Can be visible or blank.
Implements the `blanktext` option by changing text colour.
These can be used anywhere.

```
\newenvironment{blankbox}{
\renewcommand{\camelboxtitle}{}
\if@blanktext
\renewcommand{\camel@NextColour}{\camel@HideColour}
\setstretch{\camel@StretchFactor}
\else
\renewcommand{\camel@NextColour}{\camel@ShowColour}
\setstretch{1}
\fi
\begin{camelbox}
}{
\end{camelbox}
}
```

`answer` Answer box. Can be visible, blank or invisible.
Answers are associated with *exercises*.
(Solutions are associated with examples, see above.)

Implements `noanswers` using the `environ` package.
Implements `blankanswers` by changing text colour.
We use `environ` because `\exludecomment` can not be
used within a `\begin{parts}...\end{parts}` environment as
defined in `exam.cls` and replicated below.

```
\newcommand{\answertitle}{\noindent\textbf{\answername:}\enspace}
\NewEnviron{answer}{%
\if@noanswers\else%
\renewcommand{\camelboxtitle}{\answertitle}
\if@blankanswers
\renewcommand{\camel@NextColour}{\camel@HideColour}
\setstretch{\camel@StretchFactor}
\else
\renewcommand{\camel@NextColour}{\camel@AnswerColour}
\setstretch{1}
\fi
\begin{camelbox}
\BODY
\end{camelbox}
\fi%
}{}
```

`\prf` Command for short proofs. (A wrapper for the `proof` environment.)

```
\newcommand{\prf}[1]{\begin{proof}{#1}\end{proof}}
```

`\sol` Command for short solutions. (A wrapper for the `solution` environment.)

```
\newcommand{\sol}[1]{\begin{solution}{#1}\end{solution}}
```

`\ans` Command for short answers. (A wrapper for the `answer` environment.)

```
\newcommand{\ans}[1]{\begin{answer}{#1}\end{answer}}
```

`\bbx` Command for short blank boxes. (A wrapper for the `blankbox` environment.)

```
\newcommand{\bbx}[1]{\begin{blankbox}{#1}\end{blankbox}}
```

6.5 Switches

`answerson` Environments to override global options (include/exclude answers).
`answersoff` As with all environments they can be used as switches:

```
\answerson ... \endanswerson
\answersoff ... \endanswersoff
```

```
\newif\if@globalnoanswers\@globalnoanswersfalse
\newif\if@globalblankanswers\@globalblankanswersfalse
\if@noanswers
\@globalnoanswerstrue
\fi
\if@blankanswers
\@globalblankanswerstrue
```

```
\fi
\newenvironment{answerson}{
\@noanswersfalse
\@blankanswersfalse
\begingroup
}{
\endgroup
\if@globalnoanswers\@noanswerstrue\else\@noanswersfalse\fi
\if@globalblankanswers\@blankanswerstrue\else\@blankanswersfalse\fi
}
\newenvironment{answersoff}{
\@noanswerstrue
\begingroup
}{
\endgroup
\if@globalnoanswers\@noanswerstrue\else\@noanswersfalse\fi
}
```

6.6 Images

`\setscaleimage` modify scale of hidden images

```
\newcommand{\camel@ScaleHiddenImages}{1.5}
\newcommand{\setscaleimages}[1]{\renewcommand{\camel@ScaleHiddenImages}{#1}}
```

`blankimagesnow` hide images and tikz pictures this uses an internal switch @blankimagesnow

```
\newif\if@blankimagesnow
\if@blankallimages
\@blankimagesnowtrue
\fi
```

`\includegraphics` Redefine includegraphics

```
\let\oldincludegraphics=\includegraphics
\renewcommand\includegraphics[2][]{
\if@blankimagesnow
\scalebox{\camel@ScaleHiddenImages}{
\phantom{\oldincludegraphics[#1]{#2}}
}
\else
\oldincludegraphics[#1]{#2}
\fi
}
```

`\tikzmagic` Tikz magic!

```
\if@blankimagesnow
\tikzset{
every picture/.append style={%
scale=\camel@ScaleHiddenImages,
execute at end picture={\draw[fill=white,rounded corners=5pt] (current bounding box.south west)
}
```

```
}
\fi
```

`\@blanktikz` Internal command.

```
\newcommand{\@blanktikz}{
\if@blankimagesnow
\tikzset{
every picture/.append style={%
scale=\camel@ScaleHiddenImages,
execute at end picture={\draw[gray!20,thick,fill=white] (current bounding box.south west) recta
}
}
\fi
}
```

`\@fixtikz` Internal command. Draws a white box around each tikzpicture when @blankimagesnow is true

```
\newcommand{\@fixtikz}{
\tikzset{
every picture/.style={}
}
}
```

`blankgraphics` If option `blankimages` is used, the image is replaced with blank space of the same size.

```
\newcommand{\blankgraphics}[2][scale=1]{
\if@blankimages
\scalebox{\camel@ScaleHiddenImages}{\phantom{\oldincludegraphics[#1]{#2}}}
\else
\oldincludegraphics[#1]{#2}
\fi
}
```

`altgraphics` Shows the second image if option `blankimages` is set, otherwise shows the first image.

```
\newlength\imageheight
\newlength\imagewidth
\newcommand{\altgraphics}[3][scale=1]{
\if@blankimages
\settoheight{\imageheight}{\oldincludegraphics[#1]{#2}}
\settowidth{\imagewidth}{\oldincludegraphics[#1]{#2}}
\scalebox{\camel@ScaleHiddenImages}{
\oldincludegraphics[height=\imageheight,width=\imagewidth,keepaspectratio]{#3}
}
\else
\oldincludegraphics[#1]{#2}
\fi
}
```

hidegraphics
showgraphics

To manually specify different dimensions for the 'blanks' and 'full' versions of an image

```
\newcommand{\hidegraphics}[2][scale=1]{
\if@blankimages
\oldincludegraphics[#1]{#2}
\else
\null
\fi
}
\newcommand{\showgraphics}[2][scale=1]{
\if@blankimages
\null
\else
\oldincludegraphics[#1]{#2}
\fi
}
```

6.7 Macros and environments adapted from `exam.cls`

Commands to define symbols for choices and checkboxes

```
\newcommand{\choicechar}[1]{\def\choice@char{#1}}
\newcommand{\chosenchar}[1]{\def\chosen@char{#1}}
\newcommand{\checkboxchar}[1]{\def\checkbox@char{#1}}
\newcommand{\checkedchar}[1]{\def\checked@char{#1}}
```

Set default symbols

```
\newcommand{\bigsquare}{\raisebox{0.5ex}{\fbox{\phantom{\rule{0.5ex}{0.5ex}}}}}
\choicechar{$\bigcirc$}
\chosenchar{$\text{\rlap{\,$\checkmark$}}\bigcirc$}
\checkboxchar{$\bigsquare$}
\checkedchar{$\text{\rlap{\,\!$\checkmark$}}\bigsquare$}
```

Hooks (for customization)

```
\newcommand\questionshook{}
\newcommand\partshook{}
\newcommand\subpartshook{}
\newcommand\subsubpartshook{}
\newcommand\choiceshook{}
\newcommand\checkboxeshook{}
```

Counters

```
\newcounter{question}
\newcounter{partno}
\newcounter{subpart}
\newcounter{subsubpart}
\newcounter{choice}
```

Item labels for questions, parts, subparts and subsubparts

```
\newcommand\questionlabel{\arabic{question}.}
\newcommand\partlabel{(\alph{partno})}
```

```
\newcommand\subpartlabel{(\roman{subpart})}
\newcommand\subsubpartlabel{\alph{subsubpart}.}
```

Questions

```
\newenvironment{questions}{
  \def\@queslevel{question}
  \def\question{
    \def\thequestiontitle{\questionname~thequestion}
    \@checkqueslevel{question}
    \item
  }
  \def\subpart{
    \@checkqueslevel{subpart}
    \item
  }
  \def\subsubpart{
    \@checkqueslevel{subsubpart}
    \item
  }
  \list{\questionlabel}{
    \usecounter{question}
    \settowidth{\leftmargin}{10.\hskip\labelsep}
    \labelwidth\leftmargin\advance\labelwidth-\labelsep
    \partopsep=0pt
    \questionshook
    }
}{
\endlist
}
```

Parts

```
\newenvironment{parts}{
\def\@queslevel{part}
\def\part{
     \@checkqueslevel{part}
     \item
}
\list{\partlabel}{
     \usecounter{partno}\def\makelabel##1{\hss\llap{##1}}
     \settowidth{\leftmargin}{(m)\hskip\labelsep}
     \labelwidth\leftmargin\advance\labelwidth-\labelsep
     \topsep=0pt
     \partopsep=0pt
     \partshook
}
}{
\endlist
}
```

Subparts

```
\newenvironment{subparts}{
```

```
\def\@queslevel{subpart}
\list{\subpartlabel}{
     \usecounter{subpart}\def\makelabel##1{\hss\llap{##1}}
     \settowidth{\leftmargin}{vii.\hskip\labelsep}
     \labelwidth\leftmargin\advance\labelwidth-\labelsep
     \topsep=0pt
     \partopsep=0pt
     \subpartshook
    }
}{
\endlist
}
```

Subsubparts

```
\newenvironment{subsubparts}{
\def\@queslevel{subsubpart}
\list{\subsubpartlabel}{
    \usecounter{subsubpart}\def\makelabel##1{\hss\llap{##1}}
     \settowidth{\leftmargin}{($\psi$)\hskip\labelsep}
     \labelwidth\leftmargin\advance\labelwidth-\labelsep
     \topsep=0pt
     \partopsep=0pt
     \subsubpartshook
    }
}{
\endlist
}
```

Choices

```
\renewcommand\thechoice{\Alph{choice}.}
\newcommand\choicelabel{\thechoice}
\newif\if@correctchoice
\@correctchoicefalse
\newcommand\CorrectChoiceEmphasis[1]{
\def\CorrectChoice@Emphasis{#1}
}
\CorrectChoiceEmphasis{\bfseries}
\let\correctchoiceemphasis\CorrectChoiceEmphasis
\newenvironment{choices}{
\list{\choice@char}{
\usecounter{choice}
\settowidth{\leftmargin}{W.\hskip\labelsep}
        \def\choice{
        \if@correctchoice
            \endgroup
          \fi
          \item
}
\def\CorrectChoice{
\if@correctchoice
        \endgroup
```

```
        \fi
        \if@noanswers
\item
\else
\if@blankanswers
\item
\else
\begingroup
                  \@correctchoicetrue
\CorrectChoice@Emphasis
             \item[\chosen@char]
     \fi
\fi
}
\let\correctchoice\CorrectChoice
        \topsep=2pt
        \partopsep=0pt
        \choiceshook
}
}{
\if@correctchoice
\endgroup
\fi
\endlist
}
```

Checkboxes

```
\newenvironment{checkboxes}{
\list{\checkbox@char}{
\usecounter{choice}
        \settowidth{\leftmargin}{W.\hskip\labelsep}
        \def\choice{
         \if@correctchoice
            \endgroup
          \fi
\item
}
\def\CorrectChoice{
         \if@correctchoice
            \endgroup
          \fi
          \if@noanswers
          \item
\else
\if@blankanswers
\item
\else
\begingroup
            \@correctchoicetrue
            \CorrectChoice@Emphasis
```

```
            \item[\checked@char]
\fi
\fi
}
       \let\correctchoice\CorrectChoice
       \topsep=2pt
       \partopsep=0pt
       \checkboxeshook
     }
}{
    \if@correctchoice
        \endgroup
    \fi
    \endlist
}
%% Validatte nesting level
%    \begin{macrocode}
\def\@checkqueslevel#1{
  \begingroup
    \def\@temp{#1}
    \ifx\@temp\@queslevel
      \null
    \else
      \ClassError{camel}{
        I found a #1 where I expected to find a \@queslevel
        \MessageBreak
      }{
        Both #1 and \@queslevel \space can be used only inside the correct
        \MessageBreak \space \space
        environment and outside of any smaller environment
        \MessageBreak
      }
    \fi
  \endgroup
}
```

Move up one level

```
\long\def\uplevel#1{
  \par\bigskip
  \vbox{
    \leftskip=\@totalleftmargin
    \advance\leftskip-\leftmargin
    \advance\@totalleftmargin-\leftmargin
    \advance\linewidth\leftmargin
    #1
  }
  \nobreak
}
```

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