

# beamerswitch — Convenient mode selection in Beamer documents

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This class is a wrapper around the `beamer` class to make it easier to use the same document to generate the different forms of the presentation: the slides themselves, an abbreviated slide set for transparencies or online reference, an n-up handout version, and a transcript or set of notes using the `article` class.

To contact the author about this package, please visit the GitHub page where the code is hosted: <https://github.com/alex-ball/beamerswitch>.

## 1 Quick start guide

Here are the key facts:

- The `beamerswitch` class makes it easier to switch between `beamer` modes.
- It is aimed at you if you want to generate handouts from your presentation, whether printouts of your slides or something more like a paper or article.
- It is *not* a drop-in replacement for `beamer`.

If you have an existing `beamer` presentation and want convert it to use `beamerswitch` instead, here's what you need to do.

1. Have you specified class options other than `ignorenonframetext`? If so, start by rewriting your `\documentclass` line in terms of `\PassOptionsToClass` – note that the optional argument (in square brackets) becomes mandatory (in curly braces):

Before

```
\documentclass[10pt]{beamer}
```

After

```
\PassOptionsToClass{10pt}{beamer}
```

Then add `\documentclass{beamerswitch}` directly below.

Otherwise, simply replace your `\documentclass` line with the `beamerswitch` one.

2. If you did *not* specify `ignorenonframetext` as one of your `beamer` options, add a `\mode<all>` line directly after `\begin{document}`.

3. Wrap any preamble content intended only for your slides (like `\usetheme` or `\usepackage` commands) with `'\mode<presentation>{...}'` or something more specific, as required.

In summary, here is an example:

Before	After
<pre>\documentclass[10pt]{beamer}  \usetheme{metropolis}  \title{Test presentation} \begin{document}    \maketitle \end{document}</pre>	<pre>\PassOptionsToClass{10pt}{beamer} \documentclass{beamerswitch} \mode&lt;presentation&gt;{%   \usetheme{metropolis} } \title{Test presentation} \begin{document} \mode&lt;all&gt;   \maketitle \end{document}</pre>

At this point the document should compile exactly as before.

If you intend to use article mode at all, I strongly suggest that you proceed by converting your document body so it that works without the `'\mode<all>'` line. That means making sure all slide content is in a `frame` environment, new command definitions are moved to the preamble, and so on.

Lastly, read through the rest of this manual and see what `beamerswitch` can do for you!

## 2 Introduction

With `beamer`, it is possible to typeset the same document code in different ways to get different effects. The result you get depends on a potentially confusing mix of options, modes, and indeed classes.

Beamer has five modes for typesetting content. There are three modes that produce regular slides:

- The `beamer` mode relates to the normal, default slide set.
- The `trans` class option switches to the mode of the same name. It is intended for transparencies, but is really just an alternative mode that ignores 'bare' overlay specifications.
- The `handout` class option switches to the mode of the same name. It is intended for print-friendly versions, but is really just another alternative mode that ignores 'bare' overlay specifications.

The `beamer` manual shows how to use `handout` mode in conjunction with `pgfpages` to get several slides on a single side of A4 (or Letter) paper.

Beamer can also produce a double-height or double-width slide set, with the intention that each half will be shown on a different display (e.g. one for the audience, one for the speaker). There are three variations of this, activated using `\setbeameroption`:

- `show notes on second screen` uses the second screen for text marked up using `\note{<text>}`.
- `second mode text on second screen` uses the second screen for showing the slide typeset in `second` mode rather than `beamer`. Unlike `trans` and `handout`, `second` responds to ‘bare’ overlay specifications.
- `previous slide on second screen`, uses the second screen either for showing the previous slide or, if the slide has the `typeset second` option set, for showing the current slide typeset in `second` mode.

The final variation is to use a different class altogether, such as `article`, in conjunction with `beamerarticle`. In this case the content is set free-flowing in `article` mode, without any of the frame furniture.

The `beamer` manual suggests coping with all these variations by having the document code in one file, and using it as input to other files that each set up a different mode of operation. This is fine but a bit of a fiddle. It would be nice to be able to get the same effect using a single file and, ideally, a single command invocation.

The `beamerswitch` class addresses this issue by acting as a wrapper around the various options, and providing a common interface for switching between modes. More specifically, it has three main functions:

1. To provide more choice of handout-mode layouts than `pgfpages` gives you out-of-the-box. Additionally, I hope you will find the method for selecting them more memorable.
2. To enable you to switch to `article` mode with a simple change of class option, instead of having to fiddle with commented-out `\documentclass` and `\usepackage` lines.
3. To allow you to override the `beamer` mode from the command line, by choosing a given jobname suffix. Primarily this is to allow you to generate the different versions programmatically. Indeed, the class provides facilities for generating multiple versions with a single command.

### 3 Dependencies

To use `beamerswitch`, you will need to have the following packages available and reasonably up to date on your system. All of these ship with recent  $\text{\TeX}$  distributions.

- `beamer`
- `etoolbox`
- `hyperref`
- `iftex`
- `pgf`
- `shellesc`
- `xkeyval`
- `xstring`

One feature of the class uses `latexmk` by default, though you can configure it to use something else if you need or want to.

## 4 Loading the class

The class is loaded in the usual way:

```
\documentclass[options]{beamerswitch}
```

The various options are described below.

### 4.1 Choosing the mode of the current run

The `beamerswitch` class, as explained above, does not do much itself but rather helps you to switch between `beamer` modes, specifically `article`, `beamer`, `trans` and `handout`. Note that it loads `beamer` with the `ignorenonframetext` option, so that text outside frames is only shown in `article` mode.

The normal way of choosing the mode is to use the respective class options.

**article** (no value, initially unset)  
Switches to `article` mode, which uses the `article` class and resembles a normal article.

**beamer** (no value, initially set)  
Switches to `beamer` mode, which uses the `beamer` class and resembles a normal slideshow.

**handout** (no value, initially unset)  
Switches to `handout` mode, which uses the `beamer` class but uses a different series of overlay specifications. It resembles a set of printed pages with multiple slides shown on each page.

**trans** (no value, initially unset)  
Switches to `trans` mode, which uses the `beamer` class and resembles a normal slideshow, but uses a different series of overlay specifications.

There is, however, a sneaky second way of setting the mode that overrides the first, and that is to use the `\jobname`. By default, this is the name of your  $\TeX$  file minus the `.tex` extension, but you can set it to something else when you run  $\TeX$ . If you set the `\jobname` to end in one of the following suffixes, the mode will automatically switch:

- `-article` will switch to `article` mode.
- `-handout` will switch to `handout` mode.
- `-slides` will switch to `beamer` mode.
- `-trans` will switch to `trans` mode.

The idea is that you can keep your source document the same, but by running  $\TeX$  with an alternative `\jobname`, you can get a different version out with a meaningfully different file name.

Of course, you may not want to use those suffixes. Perhaps you want them in German; perhaps your document's file name already ends in one of them; perhaps 'article' or 'trans' doesn't describe what you're using those modes for. The suffixes are provided by the following commands:

### **\ArticleSuffix**

Holds the `\jobname` suffix that triggers `article` mode.

### **\BeamerSuffix**

Holds the `\jobname` suffix that triggers `beamer` mode.

### **\HandoutSuffix**

Holds the `\jobname` suffix that triggers `handout` mode.

### **\TransSuffix**

Holds the `\jobname` suffix that triggers `trans` mode.

The CamelCase is an admittedly rather obscure signal to you that, if you want to change them to something else, you should do so via `\newcommand` before loading the class:

```
\newcommand*\ArticleSuffix{-script}
\documentclass{beamerswitch}
```

## 4.2 Using more than one mode at once

Another handy feature of the class is that it can spawn parallel compilations, so you could in theory generate all four versions from a single command. It achieves this magic by escaping to the shell and running `latexmk`. Thus for it to work you need to run `TeX` with shell escape enabled and you need `latexmk` to be installed.

**alsoarticle** (no value, initially unset)

Spawns a new compilation process in `article` mode.

**alsobeamer** (no value, initially unset)

Spawns a new compilation process in `beamer` mode.

**alsohandout** (no value, initially unset)

Spawns a new compilation process in `handout` mode.

**alsotrans** (no value, initially unset)

Spawns a new compilation process in `trans` mode.

**also**=`{<comma-separated list of modes>}` (no default, initially empty)

Spawns compilation processes in each of the specified modes. Note that the list has to be wrapped in braces, and only the four aforementioned modes are recognized.

If you would rather use a tool other than `latexmk` to managed your spawned compilation processes, it is possible to do that. Bear in mind, though, that `beamerswitch` is not clever enough to spot if you have already compiled the other version on a previous run so you have to take care of that yourself. The command that does the business is this:

**\BeamerswitchSpawn**`{<suffix>}`

Spawns a new compilation process with `<suffix>` appended to the `\jobname`.

By default, `\BeamerswitchSpawn` checks which `TeX` engine you are running, and then runs the matching one of `\SpawnedPDFTeX`, `\SpawnedXeTeX`, `\SpawnedLuaTeX`, or if all the tests fail, `\SpawnedTeX`, with the converted `\jobname`. These commands all add an engine-selecting option to a base command, `\SpawnedCompiler`, which by default is `latexmk` with `synctex` enabled, shell escape disabled and interaction set to batch mode. See the [Implementation](#) section below for details.

Any of these commands can be pre-defined to something else, depending on what you want to do. So, for example, if you want to change the base `latexmk` options, pre-define `\SpawnedCompiler` to `latexmk` plus your chosen options:

```
\newcommand*\SpawnedCompiler}{%
  latexmk -silent -shell-escape -interaction=nonstopmode}
\documentclass{beamer-switch}
```

If you want to switch to using `rubber`, say, pre-define `\SpawnedPDFTeX` and friends accordingly (perhaps taking advantage of `\SpawnedCompiler` to reduce repetition):

```
\newcommand*\SpawnedCompiler}{rubber -q --synctex}
\newcommand*\SpawnedPDFTeX}{\SpawnedCompiler -m pdftex}
\newcommand*\SpawnedXeTeX}{\SpawnedCompiler -m xelatex}
\documentclass{beamer-switch}
```

If you don't need the engine selection routine provided, simply pre-define `\BeamerSwitchSpawn` to do whatever you need it to do:

```
\newcommand*\BeamerSwitchSpawn}[1]{%
  \ShellEscape{... -jobname=\jobname#1 \jobname}%
}
\documentclass{beamer-switch}
```

If you want to use `arara` to compile everything, the class options won't help you as `arara` does not let you change `\jobnames` on the command line. That's no problem, though, because you can do it manually within your list of directives:

```
% arara: lualatex
% arara: lualatex: { options: "-jobname beamer-switch-example-article" }
% arara: lualatex: { options: "-jobname beamer-switch-example-handout" }
% arara: lualatex: { options: "-jobname beamer-switch-example-trans" }
\documentclass{beamer-switch}
```

### 4.3 Improving compatibility

**nohyperref** (no value, initially unset)

The `beamer` class loads `hyperref` for you, but when you switch to `article` mode, `beamerarticle` doesn't, so it is easy for you to get caught out. To protect you from this, `beamer-switch` does load `hyperref` in `article` mode, with the pleasing side effect that `\subject` and `\keywords` then work as intended instead of throwing errors.

To achieve this, the class has to load `hyperref` quite early on, which can cause trouble with certain other packages. If you would rather load `hyperref` yourself at a different point, use this option.

**textinst** (no value, initially unset)

In all modes, patches the `\inst` command so that it prints its argument using `\textsuperscript` instead of a mathematical superscript. This helps avoid unnecessary font changes.

## 5 Setting the layout of the handouts

The class provides a simplified interface to the `pgfpages` package. By default, it prints six slides to a side of A4 paper, but you can change this by using the following command in the preamble.

**`\handoutlayout`**{*options*}

Configures the layout of the page when using `handout` mode. It has no effect in other modes. The available *options* are listed below.

**`paper`**=*paper size* (no default, initially `a4paper`)

Selects the size of paper to use for `handout` mode. The value is passed directly to `pgfpages`, so consult the documentation of that package for the allowed values. You can find them under the documentation for the `resize to` layout.

**`nup`**=*2|3|3plus|4|4plus|6|8* (no default, initially `6`)

Selects how many slides are shown on a single page in `handout` mode. The ‘plus’ layouts leave blank space for recipients to make handwritten notes next to each slide. The effects of the various values are shown in Figure 1 on page 8. Note that the `2`, `3plus`, `4` and `6` layouts are intended for slides in the usual 4:3 aspect ratio, while the `3`, `4plus` and `8` layouts are intended for widescreen slides.

**`pnos`** (no value, initially unset)

Adds page numbers to the bottom of each page. The number appears at a distance of `\handoutpnobaseline` (initially 5mm) from the bottom edge of the page. You can change this before calling `\handoutlayout`, if you like, using the usual mechanisms (e.g. `\setlength`).

**`border`**=*length* (default 0.4pt, initially 0pt)

Puts a rectangular border of thickness *length* around each slide.

**`margin`**=*length* (default 0pt, initially 5mm)

Sets how much extra space to leave around each slide on the page. To achieve this it uses the `border shrink` option from `pgfpages`. If you add page numbers, this value will increase if necessary to prevent the number colliding with the slides, so treat it as a minimum.

**`align`** (no value, initially unset)

When `margin` is non-zero, the effective page margins are approximately half the size of the gaps between slides (some additional white space comes from preserving the aspect ratio of the slides). When set, this option tweaks the positions of the slides so that the page margins are approximately the same as the interior gaps.

## 6 Changing the look of article mode

Some additional options can be set by using the following command in the preamble.

**`\articlayout`**{*options*}

Configures the appearance of `article` mode. It has no effect in other modes. The available *options* are listed below.

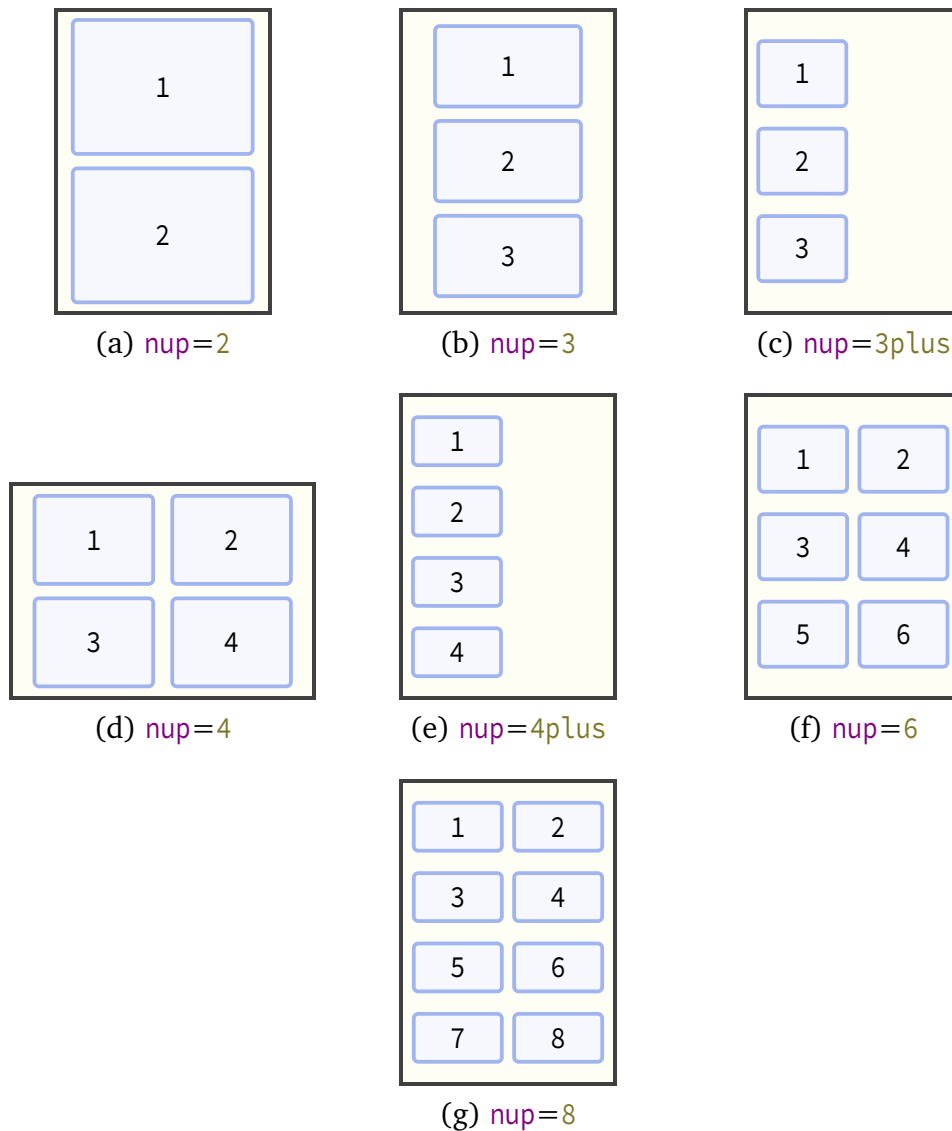


Figure 1: Handout layouts provided by `beamerswitch`

**frametitles**=`para`|`margin`|`none` (no default, initially `para`)

In `article` mode, affects how frame titles are printed. By default, `beamerarticle` prints them as paragraph headings, represented by the value `para`. To have them printed in the margin (using `\marginpar`), use `margin`. To omit them altogether, use the value `none`.

**maketitle** (no value, initially unset)

In `article` mode, adjusts the `\maketitle` routine:

- The title is printed closer to the top margin.
- The subtitle is shown joined to the title using a colon (rather than on a new line).
- The institute is shown directly beneath the author name, similar to the `beamer` layout, so you can use `\inst` just as in `beamer` to tie authors to their affiliations.

If you have `xparse` (and hence `expl3`) installed, the class will detect cases where your title ends in a character like '?' and will not add a colon to it in that case. You



can also suppress the colon manually with the following code (add it *after* using `\title` if automatic detection is in effect):

```
\toggletrue{titlepunct}
```

## 7 Tips for further configuration

There are some other ways to customize the behaviour of the various modes.

You can use the standard  $\TeX$  methods for customizing how the `article` and `beamer` classes are loaded:

```
\PassOptionsToClass{a4paper,11pt}{article} % for article mode
\PassOptionsToClass{utf8}{beamer} % for beamer, handout, trans modes
\documentclass{beamerswitch}
```

And of course there is the standard `beamer` way of passing different options to different modes:

```
\documentclass{beamerswitch}
\mode<article>{
  \usepackage[utf8]{inputenc}
}
\mode<beamer>{
  \setbeameroption{second mode text on second screen}
}
```

## 8 Feedback

I hope you find this class useful. Please report any bugs and add any suggestions for improvements or new features to the [Issue Tracker](#) on GitHub.

## 9 Implementation

### 9.1 Dependencies

We use the following packages:

- `xkeyval` with `xkvltxp` for setting options
- `etoolbox` for command patches and list processing
- `xstring` for comparisons
- `shellsc` for running parallel compilations
- `iftex` for determining which engine to use

```
19 \RequirePackage{xkeyval,xkvltxp,etoolbox,xstring,shellsc,iftex}
```

### 9.2 Class options

We recognize four main modes of operation: ‘beamer’, ‘trans’, ‘handout’, and ‘article’.

The `beamer` option triggers beamer mode.

```
20 \define@boolkey[DC]{beamerswitch}{beamer}[true]{%  
21   \ifbool{DC@beamerswitch@beamer}{%  
22     \setkeys[DC]{beamerswitch}{trans=false}  
23     \setkeys[DC]{beamerswitch}{handout=false}  
24     \setkeys[DC]{beamerswitch}{article=false}  
25   }}%  
26 }
```

The `trans` option triggers trans mode.

```
27 \define@boolkey[DC]{beamerswitch}{trans}[true]{%  
28   \ifbool{DC@beamerswitch@trans}{%  
29     \setkeys[DC]{beamerswitch}{beamer=false}  
30     \setkeys[DC]{beamerswitch}{handout=false}  
31     \setkeys[DC]{beamerswitch}{article=false}  
32   }}%  
33 }
```

The `handout` option triggers handout mode.

```
34 \define@boolkey[DC]{beamerswitch}{handout}[true]{%  
35   \ifbool{DC@beamerswitch@handout}{%  
36     \setkeys[DC]{beamerswitch}{beamer=false}  
37     \setkeys[DC]{beamerswitch}{trans=false}  
38     \setkeys[DC]{beamerswitch}{article=false}  
39   }}%  
40 }
```

The `article` option triggers article mode.

```

41 \define@boolkey[DC]{beamerswitch}{article}[true]{%
42   \ifbool{DC@beamerswitch@article}{%
43     \setkeys[DC]{beamerswitch}{beamer=false}
44     \setkeys[DC]{beamerswitch}{trans=false}
45     \setkeys[DC]{beamerswitch}{handout=false}
46   }{}%
47 }

```

The `also` option allows the user to specify a set of alternative modes to typeset in parallel, in a comma-separated list. Alternatively, the user can specify the Boolean `also*` options directly.

```

48 \define@boolkey[DC]{beamerswitch}{alsobeamer}[true]{}
49 \define@boolkey[DC]{beamerswitch}{alsotrans}[true]{}
50 \define@boolkey[DC]{beamerswitch}{alsohandout}[true]{}
51 \define@boolkey[DC]{beamerswitch}{alsoarticle}[true]{}
52 \newcommand{\beamerswitch@SetAlso}[1]{%
53   \key@ifundefined[DC]{beamerswitch}{also#1}{%
54     \ClassWarning{beamerswitch}`#1' is not a valid value for option `also'}%
55   }{}%
56   \setkeys[DC]{beamerswitch}{also#1}%
57 }%
58 }
59 \define@key[DC]{beamerswitch}{also}{%
60   \forcsvlist{\beamerswitch@SetAlso}{#1}%
61 }

```

The `nohyperref` option stops the class from loading the `hyperref` package in article mode.

```

62 \define@boolkey[DC]{beamerswitch}{nohyperref}[true]{}

```

The `textinst` option adjusts the superscript used for institution markers.

```

63 \define@boolkey[DC]{beamerswitch}{textinst}[true]{}

```

The default behaviour is to use beamer mode only.

```

64 \setkeys[DC]{beamerswitch}{beamer=true,alsobeamer=false,alsotrans=false,%
65   alsohandout=false,alsoarticle=false}

```

Now we process the options given by the user.

```

66 \ProcessOptionsX[DC]<beamerswitch>

```

### 9.3 Jobname-based mode switching

We define some default values for the special suffixes.

```

67 \providecommand*\BeamerSuffix{-slides}
68 \providecommand*\TransSuffix{-trans}
69 \providecommand*\HandoutSuffix{-handout}

```

```
70 \providecommand*\ArticleSuffix{-article}
```

We provide a special routine for spawning new  $\TeX$  processes. We allow for the possibility of the user overriding this routine with another one, perhaps using a different automation tool; it should take one argument, being the jobname suffix.

```
71 \providecommand{\SpawnedCompiler}{latexmk -silent -synctex=1
72   ↪ -interaction=batchmode }
73 \providecommand{\SpawnedTeX}{\SpawnedCompiler}
74 \providecommand{\SpawnedPDFTeX}{\SpawnedCompiler -pdf }
75 \providecommand{\SpawnedLuaTeX}{\SpawnedCompiler -pdflua }
76 \providecommand{\SpawnedXeTeX}{\SpawnedCompiler -pdfxe }
77 \providecommand{\BeamerswitchSpawn}[1]{%
78   \ifbool{PDFTeX}{%
79     \ShellEscape{\SpawnedPDFTeX -jobname=\jobname#1 \jobname}
80   }{%
81     \ifbool{LuaTeX}{%
82       \ShellEscape{\SpawnedLuaTeX -jobname=\jobname#1 \jobname}
83     }{%
84       \ifbool{XeTeX}{%
85         \ShellEscape{\SpawnedXeTeX -jobname=\jobname#1 \jobname}
86       }{%
87         \ShellEscape{\SpawnedTeX -jobname=\jobname#1 \jobname}
88       }%
89     }%
90   }%
}
```

We check for special jobnames and use them to override the above mode-related options. Note that if this happens, the `also*` options are ignored.

```
91 \IfEndWith*\jobname{\BeamerSuffix}{%
92   \setkeys[DC]{beamerswitch}{beamer=true}
93 }{%
94   \IfEndWith*\jobname{\TransSuffix}{%
95     \setkeys[DC]{beamerswitch}{trans=true}
96   }{%
97     \IfEndWith*\jobname{\HandoutSuffix}{%
98       \setkeys[DC]{beamerswitch}{handout=true}
99     }{%
100      \IfEndWith*\jobname{\ArticleSuffix}{%
101        \setkeys[DC]{beamerswitch}{article=true}
102      }{%
103        \ifbool{DC@beamerswitch@alsobeamer}{%
104          \BeamerswitchSpawn{\BeamerSuffix}%
105        }{}
106        \ifbool{DC@beamerswitch@alsotrans}{%
107          \BeamerswitchSpawn{\TransSuffix}%
108        }{}
109        \ifbool{DC@beamerswitch@alsohandout}{%
110          \BeamerswitchSpawn{\HandoutSuffix}%
111        }{}
112        \ifbool{DC@beamerswitch@alsoarticle}{%
113          \BeamerswitchSpawn{\ArticleSuffix}%
114        }{}
115      }%
116    }%
117  }%
}
```

```

115     }%
116   }%
117 }%
118 }%

```

## 9.4 Setting up modes

For article mode, we load the `article` class and the `beamerarticle` support package. Apologies for anyone hoping for `scartcl` or `memoir` alternatives.

```

119 \ifbool{DC@beamerswitch@article}{%
120   \LoadClass{article}
121   \RequirePackage{beamerarticle}

```

It seems as though `beamerarticle` expects `hyperref` to be loaded, but doesn't actually do it itself. So we oblige, using the default options specified by `beamer`.

```

122 \ifbool{DC@beamerswitch@nohyperref}{}{%
123   \RequirePackage[bookmarks=true,%
124     bookmarksopen=true,%
125     pdfborder={0 0 0},%
126     pdfhighlight={/N},%
127     linkbordercolor={.5 .5 .5}]{hyperref}%
128 }

```

While `beamer` takes care of adding presentation metadata to the PDF properties, `beamerarticle` misses the title and author properties. (It does manage to set the subject and keywords, though.) We achieve parity with some additional `\hypersetup`. Note that `beamerarticle` appends the subtitle to `\@title` with a linebreak and this does odd things in the context of `pdftitle`, so we fix it with `\pdfstringdefDisableCommands`.

```

129 \AtBeginDocument{%
130   \ifpackageloaded{hyperref}{%
131     \pdfstringdefDisableCommands{\def\<#1>#2{ - #2}}
132     \begingroup
133     \hypersetup{pdftitle={\@title}}%
134     \def\and{\unskip, }%
135     \let\thanks=\@gobble
136     \let\inst=\@gobble
137     \hypersetup{pdfauthor={\@author}}%
138     \endgroup
139   }{}%
140 }
141 }{}%

```

For the presentation modes, we load the `beamer` class with appropriate options. Since we are targeting users wanting different versions of their presentations with the same code, we activate `ignorenonframetext`.

```

142 \ifbool{DC@beamerswitch@handout}{%
143   \LoadClass[ignorenonframetext,handout]{beamer}

```

Handout mode lays multiple slides out on a single page. For this we use `pgfpages`. The actual configuration is handled later.

```
144 \RequirePackage{pgfpages}
```

We also activate `ignorenonframetext` for the other two modes.

```
145 }{%
146 \ifbool{DC@beamerswitch@trans}{%
147 \LoadClass[ignorenonframetext,trans]{beamer}
148 }{%
149 \LoadClass[ignorenonframetext]{beamer}
150 }%
151 }
152 }
```

## 9.5 Mode-independent layout

We implement the option that formats institution markers in text mode rather than math mode.

```
153 \ifbool{DC@beamerswitch@textinst}{%
154 \def\beamer@insttitle#1{\textsuperscript{#1}}
155 \def\beamer@instinst#1{\textsuperscript{#1}\ignorespaces}
156 }{}
```

## 9.6 Handout layout

In theory it would be nice to anticipate the paper size that the article mode would use, and pass that as an option to `\pgfpagesuselayout` but as that's unlikely to be clean code, we settle here for setting it with an option.

```
157 \def\beamerswitch@handoutpaper{a4paper}
158 \define@key[HL]{beamerswitch}{paper}{%
159 \def\beamerswitch@handoutpaper{#1}%
160 }
```

The `nup` option specifies how many slides to include per page. The 'plus' keyword indicates a layout with additional gaps for writing.

```
161 \newcounter{beamerswitch@nupcase}
162 \setcounter{beamerswitch@nupcase}{5}
163 \define@choicekey+[HL]{beamerswitch}{nup}[\val\nr]{2, 3, 3plus, 4, 4plus, 6, 8}{%
164 \setcounter{beamerswitch@nupcase}{\nr}
165 }{%
166 \ClassWarning{beamerswitch}{Value of `nup' not recognized.
167 Allowed values are 2, 3, 3plus, 4, 4plus, 6, and 8.}%
168 }
```

The `borders` option switches on borders around the slides on handout pages (and gaps where slides would appear if there were enough). The value is used to set the width of the border.

This is implemented as a PGF drawing command, which is initially set up to do nothing but gets filled out if the option is selected. As part of this, we calculate the number of the current slide (handoutpno gives the current page number minus one; `\beamerswitch@nup` is the number of slides per page; and `\pgf@cpn` gives the count of the current slide on the current page). If this exceeds the total number of slides, we suppress the border.

```

169 \newcommand*\beamerswitch@Border{\relax}
170 \define@key[HL]{beamerswitch}{border}[0.4pt]{%
171   \RequirePackage{pgf}%
172   \ifdimcomp{#1}{>}{0pt}{%
173     \renewcommand*\beamerswitch@Border{%
174       \ifnumcomp{(\value{handoutpno} * \beamerswitch@nup) + \the\pgf@cpn}{%
175         >}{\beamer@endpageofdocument}{%
176           \relax
177         }%
178         \pgfsetlinewidth{#1}\pgfstroke
179       }%
180     }%
181   }%
182   \renewcommand*\beamerswitch@Border{\relax}%
183 }%
184 }

```

The `margin` option controls how much white space is added around each slide on handout pages. It corresponds to the `border shrink` option of `\pgfpagesuselayout`.

```

185 \newlength{\beamerswitch@margin}
186 \setlength{\beamerswitch@margin}{5mm}
187 \define@key[HL]{beamerswitch}{margin}[0pt]{%
188   \setlength{\beamerswitch@margin}{#1}%
189 }

```

The `align` option chooses whether to rejig the positions of the slides on the page so that the effective page margin is the same as, rather than half, the space between adjacent slides.

```

190 \define@boolkey[HL]{beamerswitch}{align}[true]{}

```

The `pnos` option switches on page numbers for handout pages. The height at which the baseline of the number sits, relative to the bottom edge of the paper, is given by the length `\handoutpnobaseline`.

```

191 \newlength{\handoutpnobaseline}
192 \setlength{\handoutpnobaseline}{5mm}
193 \newcounter{handoutpno}
194 \define@boolkey[HL]{beamerswitch}{pnos}[true]{}

```

In order to implement the page numbers, we need to add a hook to the `pgfpages shipout` routine.

```

195 \def\beamerswitch@footer{}
196 \patchcmd{\pgfpages@buildshipoutbox}{%
197 \pgfsys@endpicture
198 }{%
199 \beamerswitch@footer\pgfsys@endpicture
200 }{}{}

```

We set up the `\handoutlayout` command for applying these options.

The hook `\beamerswitch@footer` is used to step the page number counter `handoutpno`; if page numbering is active, it also places the number on the page centered and `\handoutpnobaseline` up from the bottom.

The length `\beamerswitch@pnoadjust` is, conceptually, the height of the page number. When page numbers are active, the margin around slides is automatically increased to guarantee that the top of the page number will not be higher than the bottom of the lowest slide. Currently this does not account for extra whitespace arising from aspect ratio issues. When the `align` option is active, the margin at the bottom of the page is increased, but to save a register we make the adjustment to `\beamerswitch@pnoadjust` instead of a copy of `\beamerswitch@margin`.

```

201 \newlength{\beamerswitch@pnoadjust}
202 \newcommand*{\handoutlayout}[1]{%
203   \only<handout>{%
204     \setlength{\beamerswitch@pnoadjust}{1em}%
205     \setkeys[HL]{beamerswitch}{#1}%
206     \ifbool{HL@beamerswitch@pnos}{%
207       \def\beamerswitch@footer{%
208         \stepcounter{handoutpno}%
209         \setbox0\vbox{\makebox[0pt][c]{\arabic{handoutpno}}}%
210         \pgfsys@beginscope
211         \pgflevel{\pgftransformshift{%
212           \pgfpoint{.5\pgfphysicalwidth}{\handoutpnobaseline}}}%
213         \wd0=0pt%
214         \dp0=-\ht0%
215         \pgfsys@hbox0%
216         \pgfsys@endscope
217       }%
218       \ifbool{HL@beamerswitch@align}{%
219         \ifcase\value{beamerswitch@nupcase}\relax
220         \addtolength{\beamerswitch@pnoadjust}{-0.333\beamerswitch@margin}%
221         \or
222         \addtolength{\beamerswitch@pnoadjust}{-0.5\beamerswitch@margin}%
223         \or
224         \addtolength{\beamerswitch@pnoadjust}{-0.5\beamerswitch@margin}%
225         \or
226         \addtolength{\beamerswitch@pnoadjust}{-0.333\beamerswitch@margin}%
227         \or
228         \addtolength{\beamerswitch@pnoadjust}{-0.6\beamerswitch@margin}%
229         \or
230         \addtolength{\beamerswitch@pnoadjust}{-0.5\beamerswitch@margin}%
231         \or
232         \addtolength{\beamerswitch@pnoadjust}{-0.6\beamerswitch@margin}%
233       \fi
234     }{}%

```



```

235     \ifdimcomp{\beamerswitch@margin}{<}%
236         {\handoutpnobaseline + \beamerswitch@pnoadjust}{%
237         \setlength{\beamerswitch@margin}%
238         {\the\dimexpr\handoutpnobaseline + \beamerswitch@pnoadjust\relax}%
239         }{}%
240     }{}%
241     \def\beamerswitch@footer{\stepcounter{handoutpno}}%
242 }%

```

The value of the `nup` option is used both to select the layout and set the value of `\beamerswitch@nup`. The latter is used to suppress unwanted borders and check if `\handoutlayout` has been called.

```

243     \ifcase\value{beamerswitch@nupcase}\relax
244     \def\beamerswitch@nup{2}%
245     \pgfpagesuselayout{1 by 2}[\beamerswitch@handoutpaper,%
246     border shrink=\the\beamerswitch@margin]%
247     \or
248     \def\beamerswitch@nup{3}%
249     \pgfpagesuselayout{1 by 3}[\beamerswitch@handoutpaper,%
250     border shrink=\the\beamerswitch@margin]%
251     \or
252     \def\beamerswitch@nup{3}%
253     \pgfpagesuselayout{1 by 3 narrow}[\beamerswitch@handoutpaper,%
254     border shrink=\the\beamerswitch@margin]%
255     \or
256     \def\beamerswitch@nup{4}%
257     \pgfpagesuselayout{2 by 2}[\beamerswitch@handoutpaper,%
258     landscape,border shrink=\the\beamerswitch@margin]%
259     \or
260     \def\beamerswitch@nup{4}%
261     \pgfpagesuselayout{1 by 4 narrow}[\beamerswitch@handoutpaper,%
262     border shrink=\the\beamerswitch@margin]%
263     \or
264     \def\beamerswitch@nup{6}%
265     \pgfpagesuselayout{2 by 3}[\beamerswitch@handoutpaper,%
266     border shrink=\the\beamerswitch@margin]%
267     \or
268     \def\beamerswitch@nup{8}%
269     \pgfpagesuselayout{2 by 4}[\beamerswitch@handoutpaper,%
270     border shrink=\the\beamerswitch@margin]%
271     \fi
272 }%
273 }

```

We initialize the class with the defaults set above.

```

274 \AtEndPreamble{%
275     \ifdef{\beamerswitch@nup}{}{}%
276     \handoutlayout{}%
277 }%
278 }

```

Though `pgfpages` defines some perfectly fine layouts, we need to add configurability to the existing ones and provide some new ones.

The ‘1 by 2’ layout is similar to the normal `2 on 1` layout.

```

279 \mode<handout>{%
280   \pgfpagesdeclarelayout{1 by 2}
281   {
282     \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
283     \edef\pgfpageoptionwidth{\the\paperheight}
284     \def\pgfpageoptionborder{0pt}
285     \def\pgfpageoptionfirstshipout{1}
286   }
287   {
288     \pgfpagesphysicalpageoptions
289     {%
290       logical pages=2,%
291       physical height=\pgfpageoptionheight,%
292       physical width=\pgfpageoptionwidth,%
293       current logical shipout=\pgfpageoptionfirstshipout%
294     }
295     \ifdim\paperheight>\paperwidth\relax
296     % put side-by-side
297     \pgfpageslogicalpageoptions{1}
298     {%
299       border shrink=\pgfpageoptionborder,%
300       border code=\beamerswitch@Border,%
301       resized width=.5\pgfphysicalwidth,%
302       resized height=\pgfphysicalheight,%
303       center=\ifbool{HL@beamerswitch@align}{%
304         \pgfpoint{.25\pgfphysicalwidth +
305           ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%
306         }{%
307           \pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
308         }%
309     }%
310     \pgfpageslogicalpageoptions{2}
311     {%
312       border shrink=\pgfpageoptionborder,%
313       border code=\beamerswitch@Border,%
314       resized width=.5\pgfphysicalwidth,%
315       resized height=\pgfphysicalheight,%
316       center=\ifbool{HL@beamerswitch@align}{%
317         \pgfpoint{.75\pgfphysicalwidth -
318           ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%
319         }{%
320           \pgfpoint{.75\pgfphysicalwidth}{.5\pgfphysicalheight}%
321         }%
322     }%
323     \else
324     % stack on top of one another
325     \pgfpageslogicalpageoptions{1}
326     {%
327       border shrink=\pgfpageoptionborder,%
328       border code=\beamerswitch@Border,%
329       resized width=\pgfphysicalwidth,%
330       resized height=.5\pgfphysicalheight,%
331       center=\ifbool{HL@beamerswitch@align}{%
332         \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight -
333           ↪ 0.333\beamerswitch@margin}%
334         }{%
335           \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
336         }%
337     }%

```

```

332     \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
333   }%
334 }%
335 \pgfpageslogicalpageoptions{2}
336 {%
337   border shrink=\pgfpageoptionborder,%
338   border code=\beamerswitch@Border,%
339   resized width=\pgfphysicalwidth,%
340   resized height=.5\pgfphysicalheight,%
341   center=\ifbool{HL@beamerswitch@align}{%
342     \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight +
      ↪ 0.333\beamerswitch@margin}%
343   }{%
344     \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight}%
345   }%
346 }%
347 \fi
348 }

```

The ‘1 by 3’ layout is similar to the ‘1 by 2’, but with an extra row.

```

349 \pgfpagesdeclarelayout{1 by 3}
350 {
351   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
352   \edef\pgfpageoptionwidth{\the\paperheight}
353   \def\pgfpageoptionborder{0pt}
354   \def\pgfpageoptionfirstshipout{1}
355 }
356 {
357   \pgfpagesphysicalpageoptions
358   {%
359     logical pages=3,%
360     physical height=\pgfpageoptionheight,%
361     physical width=\pgfpageoptionwidth,%
362     current logical shipout=\pgfpageoptionfirstshipout%
363   }
364   \ifdim\paperheight>\paperwidth\relax
365     % put side-by-side
366     \pgfpageslogicalpageoptions{1}
367     {%
368       border shrink=\pgfpageoptionborder,%
369       border code=\beamerswitch@Border,%
370       resized width=.333\pgfphysicalwidth,%
371       resized height=\pgfphysicalheight,%
372       center=\ifbool{HL@beamerswitch@align}{%
373         \pgfpoint{.167\pgfphysicalwidth +
          ↪ 0.5\beamerswitch@margin}{.5\pgfphysicalheight}%
374       }{%
375         \pgfpoint{.167\pgfphysicalwidth}{.5\pgfphysicalheight}%
376       }%
377     }%
378     \pgfpageslogicalpageoptions{2}
379     {%
380       border shrink=\pgfpageoptionborder,%
381       border code=\beamerswitch@Border,%
382       resized width=.333\pgfphysicalwidth,%

```

```

383     resized height=\pgfphysicalheight,%
384     center=\pgfpoin{.5\pgfphysicalwidth}{.5\pgfphysicalheight}%
385 }%
386 \pgfpageslogicalpageoptions{3}
387 {%
388     border shrink=\pgfpageoptionborder,%
389     border code=\beamerswitch@Border,%
390     resized width=.333\pgfphysicalwidth,%
391     resized height=\pgfphysicalheight,%
392     center=\ifbool{HL@beamerswitch@align}{%
393         \pgfpoin{.833\pgfphysicalwidth -
394             ↪ 0.5\beamerswitch@margin}{.5\pgfphysicalheight}%
395         }{%
396             \pgfpoin{.833\pgfphysicalwidth}{.5\pgfphysicalheight}%
397         }%
398     \else
399     % stack on top of one another
400     \pgfpageslogicalpageoptions{1}
401     {%
402         border shrink=\pgfpageoptionborder,%
403         border code=\beamerswitch@Border,%
404         resized width=\pgfphysicalwidth,%
405         resized height=.333\pgfphysicalheight,%
406         center=\ifbool{HL@beamerswitch@align}{%
407             \pgfpoin{.5\pgfphysicalwidth}{.833\pgfphysicalheight -
408                 ↪ 0.5\beamerswitch@margin}%
409             }{%
410                 \pgfpoin{.5\pgfphysicalwidth}{.833\pgfphysicalheight}%
411             }%
412         \pgfpageslogicalpageoptions{2}
413         {%
414             border shrink=\pgfpageoptionborder,%
415             border code=\beamerswitch@Border,%
416             resized width=\pgfphysicalwidth,%
417             resized height=.333\pgfphysicalheight,%
418             center=\pgfpoin{.5\pgfphysicalwidth}{.5\pgfphysicalheight}%
419         }%
420         \pgfpageslogicalpageoptions{3}
421         {%
422             border shrink=\pgfpageoptionborder,%
423             border code=\beamerswitch@Border,%
424             resized width=\pgfphysicalwidth,%
425             resized height=.333\pgfphysicalheight,%
426             center=\ifbool{HL@beamerswitch@align}{%
427                 \pgfpoin{.5\pgfphysicalwidth}{.167\pgfphysicalheight +
428                     ↪ 0.5\beamerswitch@margin}%
429                 }{%
430                     \pgfpoin{.5\pgfphysicalwidth}{.167\pgfphysicalheight}%
431                 }%
432             \fi
433         }

```

The ‘1 by 3 narrow’ layout is like the ‘1 by 3’ layout but restricted to the left (or top) half of the page.

```

434 \pgfpagesdeclarelayout{1 by 3 narrow}
435 {
436   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
437   \edef\pgfpageoptionwidth{\the\paperheight}
438   \def\pgfpageoptionborder{0pt}
439   \def\pgfpageoptionfirstshipout{1}
440 }
441 {
442   \pgfpagesphysicalpageoptions
443   {%
444     logical pages=3,%
445     physical height=\pgfpageoptionheight,%
446     physical width=\pgfpageoptionwidth,%
447     current logical shipout=\pgfpageoptionfirstshipout%
448   }
449   \ifdim\paperheight>\paperwidth\relax
450   % put side-by-side
451   \pgfpageslogicalpageoptions{1}
452   {%
453     border shrink=\pgfpageoptionborder,%
454     border code=\beamerswitch@Border,%
455     resized width=.333\pgfphysicalwidth,%
456     resized height=.5\pgfphysicalheight,%
457     center=\ifbool{HL@beamerswitch@align}{%
458       \pgfpoint{.167\pgfphysicalwidth + 0.5\beamerswitch@margin}%
459       {.75\pgfphysicalheight - 0.5\beamerswitch@margin}%
460     }{%
461       \pgfpoint{.167\pgfphysicalwidth}{.75\pgfphysicalheight}%
462     }%
463   }%
464   \pgfpageslogicalpageoptions{2}
465   {%
466     border shrink=\pgfpageoptionborder,%
467     border code=\beamerswitch@Border,%
468     resized width=.333\pgfphysicalwidth,%
469     resized height=.5\pgfphysicalheight,%
470     center=\ifbool{HL@beamerswitch@align}{%
471       \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight -
472         ↪ 0.5\beamerswitch@margin}%
473     }{%
474       \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
475     }%
476   }%
477   \pgfpageslogicalpageoptions{3}
478   {%
479     border shrink=\pgfpageoptionborder,%
480     border code=\beamerswitch@Border,%
481     resized width=.333\pgfphysicalwidth,%
482     resized height=.5\pgfphysicalheight,%
483     center=\ifbool{HL@beamerswitch@align}{%
484       \pgfpoint{.833\pgfphysicalwidth - 0.5\beamerswitch@margin}%
485       {.75\pgfphysicalheight - 0.5\beamerswitch@margin}%
486     }{%
487       \pgfpoint{.833\pgfphysicalwidth}{.75\pgfphysicalheight}%
488     }%
489   }%

```

```

489 \else
490 % stack on top of one another
491 \pgfpageslogicalpageoptions{1}
492 {%
493 border shrink=\pgfpageoptionborder,%
494 border code=\beamerswitch@Border,%
495 resized width=.5\pgfphysicalwidth,%
496 resized height=.333\pgfphysicalheight,%
497 center=\ifbool{HL@beamerswitch@align}{%
498 \pgfpoint{.25\pgfphysicalwidth + 0.5\beamerswitch@margin}%
499 {.833\pgfphysicalheight - 0.5\beamerswitch@margin}%
500 }{%
501 \pgfpoint{.25\pgfphysicalwidth}{.833\pgfphysicalheight}%
502 }%
503 }%
504 \pgfpageslogicalpageoptions{2}
505 {%
506 border shrink=\pgfpageoptionborder,%
507 border code=\beamerswitch@Border,%
508 resized width=.5\pgfphysicalwidth,%
509 resized height=.333\pgfphysicalheight,%
510 center=\ifbool{HL@beamerswitch@align}{%
511 \pgfpoint{.25\pgfphysicalwidth +
512 → 0.5\beamerswitch@margin}{.5\pgfphysicalheight}%
513 }{%
514 \pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
515 }%
516 }%
517 \pgfpageslogicalpageoptions{3}
518 {%
519 border shrink=\pgfpageoptionborder,%
520 border code=\beamerswitch@Border,%
521 resized width=.5\pgfphysicalwidth,%
522 resized height=.333\pgfphysicalheight,%
523 center=\ifbool{HL@beamerswitch@align}{%
524 \pgfpoint{.25\pgfphysicalwidth + 0.5\beamerswitch@margin}%
525 {.167\pgfphysicalheight + 0.5\beamerswitch@margin}%
526 }{%
527 \pgfpoint{.25\pgfphysicalwidth}{.167\pgfphysicalheight}%
528 }%
529 }%
530 \fi
}

```

The ‘2 by 2’ layout is similar to the normal 4 on 1 layout.

```

531 \pgfpagesdeclarelayout{2 by 2}
532 {
533 \edef\pgfpageoptionheight{\the\paperheight}
534 \edef\pgfpageoptionwidth{\the\paperwidth}
535 \edef\pgfpageoptionborder{0pt}
536 }
537 {
538 \pgfpagesphysicalpageoptions
539 {%
540 logical pages=4,%

```

```

541     physical height=\pgfpageoptionheight,%
542     physical width=\pgfpageoptionwidth%
543 }
544 \pgfpageslogicalpageoptions{1}
545 {%
546     border shrink=\pgfpageoptionborder,%
547     border code=\beamerswitch@Border,%
548     resized width=.5\pgfphysicalwidth,%
549     resized height=.5\pgfphysicalheight,%
550     center=\ifbool{HL@beamerswitch@align}{%
551         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
552         {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
553     }{%
554         \pgfpoint{.25\pgfphysicalwidth}{.75\pgfphysicalheight}%
555     }%
556 }%
557 \pgfpageslogicalpageoptions{2}
558 {%
559     border shrink=\pgfpageoptionborder,%
560     border code=\beamerswitch@Border,%
561     resized width=.5\pgfphysicalwidth,%
562     resized height=.5\pgfphysicalheight,%
563     center=\ifbool{HL@beamerswitch@align}{%
564         \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
565         {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
566     }{%
567         \pgfpoint{.75\pgfphysicalwidth}{.75\pgfphysicalheight}%
568     }%
569 }%
570 \pgfpageslogicalpageoptions{3}
571 {%
572     border shrink=\pgfpageoptionborder,%
573     border code=\beamerswitch@Border,%
574     resized width=.5\pgfphysicalwidth,%
575     resized height=.5\pgfphysicalheight,%
576     center=\ifbool{HL@beamerswitch@align}{%
577         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
578         {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
579     }{%
580         \pgfpoint{.25\pgfphysicalwidth}{.25\pgfphysicalheight}%
581     }%
582 }%
583 \pgfpageslogicalpageoptions{4}
584 {%
585     border shrink=\pgfpageoptionborder,%
586     border code=\beamerswitch@Border,%
587     resized width=.5\pgfphysicalwidth,%
588     resized height=.5\pgfphysicalheight,%
589     center=\ifbool{HL@beamerswitch@align}{%
590         \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
591         {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
592     }{%
593         \pgfpoint{.75\pgfphysicalwidth}{.25\pgfphysicalheight}%
594     }%
595 }%
596 }

```

The ‘1 by 4 narrow’ layout puts four slides in a column on the left half of the page (or in a row on the top half).

```

597 \pgfpagesdeclarelayout{1 by 4 narrow}
598 {
599   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
600   \edef\pgfpageoptionwidth{\the\paperheight}
601   \def\pgfpageoptionborder{0pt}
602   \def\pgfpageoptionfirstshipout{1}
603 }
604 {
605   \pgfpagesphysicalpageoptions
606   {%
607     logical pages=4,%
608     physical height=\pgfpageoptionheight,%
609     physical width=\pgfpageoptionwidth,%
610     current logical shipout=\pgfpageoptionfirstshipout%
611   }
612   \ifdim\paperheight>\paperwidth\relax
613   % put side-by-side
614   \pgfpageslogicalpageoptions{1}
615   {%
616     border shrink=\pgfpageoptionborder,%
617     border code=\beamerswitch@Border,%
618     resized width=.25\pgfphysicalwidth,%
619     resized height=.5\pgfphysicalheight,%
620     center=\ifbool{HL@beamerswitch@align}{%
621       \pgfpoint{.125\pgfphysicalwidth + 0.6\beamerswitch@margin}%
622       {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
623     }{%
624       \pgfpoint{.125\pgfphysicalwidth}{.75\pgfphysicalheight}%
625     }%
626   }%
627   \pgfpageslogicalpageoptions{2}
628   {%
629     border shrink=\pgfpageoptionborder,%
630     border code=\beamerswitch@Border,%
631     resized width=.25\pgfphysicalwidth,%
632     resized height=.5\pgfphysicalheight,%
633     center=\ifbool{HL@beamerswitch@align}{%
634       \pgfpoint{.375\pgfphysicalwidth + 0.2\beamerswitch@margin}%
635       {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
636     }{%
637       \pgfpoint{.375\pgfphysicalwidth}{.75\pgfphysicalheight}%
638     }%
639   }%
640   \pgfpageslogicalpageoptions{3}
641   {%
642     border shrink=\pgfpageoptionborder,%
643     border code=\beamerswitch@Border,%
644     resized width=.25\pgfphysicalwidth,%
645     resized height=.5\pgfphysicalheight,%
646     center=\ifbool{HL@beamerswitch@align}{%
647       \pgfpoint{.625\pgfphysicalwidth - 0.2\beamerswitch@margin}%
648       {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
649     }{%
650       \pgfpoint{.625\pgfphysicalwidth}{.75\pgfphysicalheight}%

```



```

651     }%
652 }%
653 \pgfpageslogicalpageoptions{4}
654 {%
655     border shrink=\pgfpageoptionborder,%
656     border code=\beamerswitch@Border,%
657     resized width=.25\pgfphysicalwidth,%
658     resized height=.5\pgfphysicalheight,%
659     center=\ifbool{HL@beamerswitch@align}{%
660         \pgfpoint{.875\pgfphysicalwidth - 0.6\beamerswitch@margin}%
661         {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
662     }{%
663         \pgfpoint{.875\pgfphysicalwidth}{.75\pgfphysicalheight}%
664     }%
665 }%
666 \else
667 % stack on top of one another
668 \pgfpageslogicalpageoptions{1}
669 {%
670     border shrink=\pgfpageoptionborder,%
671     border code=\beamerswitch@Border,%
672     resized width=.5\pgfphysicalwidth,%
673     resized height=.25\pgfphysicalheight,%
674     center=\ifbool{HL@beamerswitch@align}{%
675         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
676         {.875\pgfphysicalheight - 0.6\beamerswitch@margin}%
677     }{%
678         \pgfpoint{.25\pgfphysicalwidth}{.875\pgfphysicalheight}%
679     }%
680 }%
681 \pgfpageslogicalpageoptions{2}
682 {%
683     border shrink=\pgfpageoptionborder,%
684     border code=\beamerswitch@Border,%
685     resized width=.5\pgfphysicalwidth,%
686     resized height=.25\pgfphysicalheight,%
687     center=\ifbool{HL@beamerswitch@align}{%
688         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
689         {.625\pgfphysicalheight - 0.2\beamerswitch@margin}%
690     }{%
691         \pgfpoint{.25\pgfphysicalwidth}{.625\pgfphysicalheight}%
692     }%
693 }%
694 \pgfpageslogicalpageoptions{3}
695 {%
696     border shrink=\pgfpageoptionborder,%
697     border code=\beamerswitch@Border,%
698     resized width=.5\pgfphysicalwidth,%
699     resized height=.25\pgfphysicalheight,%
700     center=\ifbool{HL@beamerswitch@align}{%
701         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
702         {.375\pgfphysicalheight + 0.2\beamerswitch@margin}%
703     }{%
704         \pgfpoint{.25\pgfphysicalwidth}{.375\pgfphysicalheight}%
705     }%
706 }%

```

```

707 \pgfpageslogicalpageoptions{4}
708 {%
709 border shrink=\pgfpageoptionborder,%
710 border code=\beamerswitch@Border,%
711 resized width=.5\pgfphysicalwidth,%
712 resized height=.25 \pgfphysicalheight,%
713 center=\ifbool{HL@beamerswitch@align}{%
714 \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
715 {.125\pgfphysicalheight + 0.6\beamerswitch@margin}%
716 }{%
717 \pgfpoint{.25\pgfphysicalwidth}{.125\pgfphysicalheight}%
718 }%
719 }%
720 \fi
721 }

```

The '2 by 3' layout positions the slides as three rows of two slides each.

```

722 \pgfpagesdeclarelayout{2 by 3}
723 {
724 \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
725 \edef\pgfpageoptionwidth{\the\paperheight}
726 \def\pgfpageoptionborder{0pt}
727 \def\pgfpageoptionfirstshipout{1}
728 }
729 {
730 \pgfpagesphysicalpageoptions
731 {%
732 logical pages=6,%
733 physical height=\pgfpageoptionheight,%
734 physical width=\pgfpageoptionwidth,%
735 current logical shipout=\pgfpageoptionfirstshipout%
736 }
737 \ifdim\paperheight>\paperwidth\relax
738 % put side-by-side
739 \pgfpageslogicalpageoptions{1}
740 {%
741 border shrink=\pgfpageoptionborder,%
742 border code=\beamerswitch@Border,%
743 resized width=.333\pgfphysicalwidth,%
744 resized height=.5\pgfphysicalheight,%
745 center=\ifbool{HL@beamerswitch@align}{%
746 \pgfpoint{.167\pgfphysicalwidth + 0.5\beamerswitch@margin}%
747 {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
748 }{%
749 \pgfpoint{.167\pgfphysicalwidth}{.75\pgfphysicalheight}%
750 }%
751 }%
752 \pgfpageslogicalpageoptions{2}
753 {%
754 border shrink=\pgfpageoptionborder,%
755 border code=\beamerswitch@Border,%
756 resized width=.333\pgfphysicalwidth,%
757 resized height=.5\pgfphysicalheight,%
758 center=\ifbool{HL@beamerswitch@align}{%

```

```

759     \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight -
      ↪ 0.333\beamerswitch@margin}%
760   }{%
761     \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
762   }%
763 }%
764 \pgfpageslogicalpageoptions{3}
765 {%
766   border shrink=\pgfpageoptionborder,%
767   border code=\beamerswitch@Border,%
768   resized width=.333\pgfphysicalwidth,%
769   resized height=.5\pgfphysicalheight,%
770   center=\ifbool{HL@beamerswitch@align}{%
771     \pgfpoint{.833\pgfphysicalwidth - 0.5\beamerswitch@margin}%
772     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
773   }{%
774     \pgfpoint{.833\pgfphysicalwidth}{.75\pgfphysicalheight}%
775   }%
776 }%
777 \pgfpageslogicalpageoptions{4}
778 {%
779   border shrink=\pgfpageoptionborder,%
780   border code=\beamerswitch@Border,%
781   resized width=.333\pgfphysicalwidth,%
782   resized height=.5\pgfphysicalheight,%
783   center=\ifbool{HL@beamerswitch@align}{%
784     \pgfpoint{.167\pgfphysicalwidth + 0.5\beamerswitch@margin}%
785     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
786   }{%
787     \pgfpoint{.167\pgfphysicalwidth}{.25\pgfphysicalheight}%
788   }%
789 }%
790 \pgfpageslogicalpageoptions{5}
791 {%
792   border shrink=\pgfpageoptionborder,%
793   border code=\beamerswitch@Border,%
794   resized width=.333\pgfphysicalwidth,%
795   resized height=.5\pgfphysicalheight,%
796   center=\ifbool{HL@beamerswitch@align}{%
797     \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight +
      ↪ 0.333\beamerswitch@margin}%
798   }{%
799     \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight}%
800   }%
801 }%
802 \pgfpageslogicalpageoptions{6}
803 {%
804   border shrink=\pgfpageoptionborder,%
805   border code=\beamerswitch@Border,%
806   resized width=.333\pgfphysicalwidth,%
807   resized height=.5\pgfphysicalheight,%
808   center=\ifbool{HL@beamerswitch@align}{%
809     \pgfpoint{.833\pgfphysicalwidth - 0.5\beamerswitch@margin}%
810     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
811   }{%
812     \pgfpoint{.833\pgfphysicalwidth}{.25\pgfphysicalheight}%

```

```

813     }%
814 }%
815 \else
816 % stack on top of one another
817 \pgfpageslogicalpageoptions{1}
818 {%
819     border shrink=\pgfpageoptionborder,%
820     border code=\beamerswitch@Border,%
821     resized width=.5\pgfphysicalwidth,%
822     resized height=.333\pgfphysicalheight,%
823     center=\ifbool{HL@beamerswitch@align}{%
824         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
825             {.833\pgfphysicalheight - 0.5\beamerswitch@margin}%
826     }{%
827         \pgfpoint{.25\pgfphysicalwidth}{.833\pgfphysicalheight}%
828     }%
829 }%
830 \pgfpageslogicalpageoptions{2}
831 {%
832     border shrink=\pgfpageoptionborder,%
833     border code=\beamerswitch@Border,%
834     resized width=.5\pgfphysicalwidth,%
835     resized height=.333\pgfphysicalheight,%
836     center=\ifbool{HL@beamerswitch@align}{%
837         \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
838             {.833\pgfphysicalheight - 0.5\beamerswitch@margin}%
839     }{%
840         \pgfpoint{.75\pgfphysicalwidth}{.833\pgfphysicalheight}%
841     }%
842 }%
843 \pgfpageslogicalpageoptions{3}
844 {%
845     border shrink=\pgfpageoptionborder,%
846     border code=\beamerswitch@Border,%
847     resized width=.5\pgfphysicalwidth,%
848     resized height=.333\pgfphysicalheight,%
849     center=\ifbool{HL@beamerswitch@align}{%
850         \pgfpoint{.25\pgfphysicalwidth +
851             ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%
852     }{%
853         \pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
854     }%
855 }%
856 \pgfpageslogicalpageoptions{4}
857 {%
858     border shrink=\pgfpageoptionborder,%
859     border code=\beamerswitch@Border,%
860     resized width=.5\pgfphysicalwidth,%
861     resized height=.333\pgfphysicalheight,%
862     center=\ifbool{HL@beamerswitch@align}{%
863         \pgfpoint{.75\pgfphysicalwidth -
864             ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%
865     }{%
866         \pgfpoint{.75\pgfphysicalwidth}{.5\pgfphysicalheight}%

```

```

867 \pgfpageslogicalpageoptions{5}
868 {%
869   border shrink=\pgfpageoptionborder,%
870   border code=\beamerswitch@Border,%
871   resized width=.5\pgfphysicalwidth,%
872   resized height=.333\pgfphysicalheight,%
873   center=\ifbool{HL@beamerswitch@align}{%
874     \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
875     {.167\pgfphysicalheight + 0.5\beamerswitch@margin}%
876   }{%
877     \pgfpoint{.25\pgfphysicalwidth}{.167\pgfphysicalheight}%
878   }%
879 }%
880 \pgfpageslogicalpageoptions{6}
881 {%
882   border shrink=\pgfpageoptionborder,%
883   border code=\beamerswitch@Border,%
884   resized width=.5\pgfphysicalwidth,%
885   resized height=.333\pgfphysicalheight,%
886   center=\ifbool{HL@beamerswitch@align}{%
887     \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
888     {.167\pgfphysicalheight + 0.5\beamerswitch@margin}%
889   }{%
890     \pgfpoint{.75\pgfphysicalwidth}{.167\pgfphysicalheight}%
891   }%
892 }%
893 \fi
894 }

```

The ‘2 by 4’ layout layout positions the slides as four rows of two slides each.

```

895 \pgfpagesdeclarelayers{2 by 4}
896 {
897   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
898   \edef\pgfpageoptionwidth{\the\paperheight}
899   \def\pgfpageoptionborder{0pt}
900   \def\pgfpageoptionfirstshipout{1}
901 }
902 {
903   \pgfpagesphysicalpageoptions
904   {%
905     logical pages=8,%
906     physical height=\pgfpageoptionheight,%
907     physical width=\pgfpageoptionwidth,%
908     current logical shipout=\pgfpageoptionfirstshipout%
909   }
910   \ifdim\paperheight>\paperwidth\relax
911     % put side-by-side
912     \pgfpageslogicalpageoptions{1}
913     {%
914       border shrink=\pgfpageoptionborder,%
915       border code=\beamerswitch@Border,%
916       resized width=.25\pgfphysicalwidth,%
917       resized height=.5\pgfphysicalheight,%
918       center=\ifbool{HL@beamerswitch@align}{%
919         \pgfpoint{.125\pgfphysicalwidth + 0.6\beamerswitch@margin}%

```

```

920     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
921   }{%
922     \pgfpoint{.125\pgfphysicalwidth}{.75\pgfphysicalheight}%
923   }%
924 }%
925 \pgfpageslogicalpageoptions{2}
926 {%
927   border shrink=\pgfpageoptionborder,%
928   border code=\beamerswitch@Border,%
929   resized width=.25\pgfphysicalwidth,%
930   resized height=.5\pgfphysicalheight,%
931   center=\ifbool{HL@beamerswitch@align}{%
932     \pgfpoint{.375\pgfphysicalwidth + 0.2\beamerswitch@margin}%
933     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
934   }{%
935     \pgfpoint{.375\pgfphysicalwidth}{.75\pgfphysicalheight}%
936   }%
937 }%
938 \pgfpageslogicalpageoptions{3}
939 {%
940   border shrink=\pgfpageoptionborder,%
941   border code=\beamerswitch@Border,%
942   resized width=.25\pgfphysicalwidth,%
943   resized height=.5\pgfphysicalheight,%
944   center=\ifbool{HL@beamerswitch@align}{%
945     \pgfpoint{.625\pgfphysicalwidth - 0.2\beamerswitch@margin}%
946     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
947   }{%
948     \pgfpoint{.625\pgfphysicalwidth}{.75\pgfphysicalheight}%
949   }%
950 }%
951 \pgfpageslogicalpageoptions{4}
952 {%
953   border shrink=\pgfpageoptionborder,%
954   border code=\beamerswitch@Border,%
955   resized width=.25\pgfphysicalwidth,%
956   resized height=.5\pgfphysicalheight,%
957   center=\ifbool{HL@beamerswitch@align}{%
958     \pgfpoint{.875\pgfphysicalwidth - 0.6\beamerswitch@margin}%
959     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
960   }{%
961     \pgfpoint{.875\pgfphysicalwidth}{.75\pgfphysicalheight}%
962   }%
963 }%
964 \pgfpageslogicalpageoptions{5}
965 {%
966   border shrink=\pgfpageoptionborder,%
967   border code=\beamerswitch@Border,%
968   resized width=.25\pgfphysicalwidth,%
969   resized height=.5\pgfphysicalheight,%
970   center=\ifbool{HL@beamerswitch@align}{%
971     \pgfpoint{.125\pgfphysicalwidth + 0.6\beamerswitch@margin}%
972     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
973   }{%
974     \pgfpoint{.125\pgfphysicalwidth}{.25\pgfphysicalheight}%
975   }%

```

```

976 }%
977 \pgfpageslogicalpageoptions{6}
978 {%
979   border shrink=\pgfpageoptionborder,%
980   border code=\beamerswitch@Border,%
981   resized width=.25\pgfphysicalwidth,%
982   resized height=.5\pgfphysicalheight,%
983   center=\ifbool{HL@beamerswitch@align}{%
984     \pgfpoint{.375\pgfphysicalwidth + 0.2\beamerswitch@margin}%
985     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
986   }{%
987     \pgfpoint{.375\pgfphysicalwidth}{.25\pgfphysicalheight}%
988   }%
989 }%
990 \pgfpageslogicalpageoptions{7}
991 {%
992   border shrink=\pgfpageoptionborder,%
993   border code=\beamerswitch@Border,%
994   resized width=.25\pgfphysicalwidth,%
995   resized height=.5\pgfphysicalheight,%
996   center=\ifbool{HL@beamerswitch@align}{%
997     \pgfpoint{.625\pgfphysicalwidth - 0.2\beamerswitch@margin}%
998     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
999   }{%
1000     \pgfpoint{.625\pgfphysicalwidth}{.25\pgfphysicalheight}%
1001   }%
1002 }%
1003 \pgfpageslogicalpageoptions{8}
1004 {%
1005   border shrink=\pgfpageoptionborder,%
1006   border code=\beamerswitch@Border,%
1007   resized width=.25\pgfphysicalwidth,%
1008   resized height=.5\pgfphysicalheight,%
1009   center=\ifbool{HL@beamerswitch@align}{%
1010     \pgfpoint{.875\pgfphysicalwidth - 0.6\beamerswitch@margin}%
1011     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
1012   }{%
1013     \pgfpoint{.875\pgfphysicalwidth}{.25\pgfphysicalheight}%
1014   }%
1015 }%
1016 \else
1017 % stack on top of one another
1018 \pgfpageslogicalpageoptions{1}
1019 {%
1020   border shrink=\pgfpageoptionborder,%
1021   border code=\beamerswitch@Border,%
1022   resized width=.5\pgfphysicalwidth,%
1023   resized height=.25\pgfphysicalheight,%
1024   center=\ifbool{HL@beamerswitch@align}{%
1025     \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1026     {.875\pgfphysicalheight - 0.6\beamerswitch@margin}%
1027   }{%
1028     \pgfpoint{.25\pgfphysicalwidth}{.875\pgfphysicalheight}%
1029   }%
1030 }%
1031 \pgfpageslogicalpageoptions{2}

```

```

1032  {%
1033    border shrink=\pgfpageoptionborder,%
1034    border code=\beamerswitch@Border,%
1035    resized width=.5\pgfphysicalwidth,%
1036    resized height=.25\pgfphysicalheight,%
1037    center=\ifbool{HL@beamerswitch@align}{%
1038      \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1039      {.875\pgfphysicalheight - 0.6\beamerswitch@margin}%
1040    }{%
1041      \pgfpoint{.75\pgfphysicalwidth}{.875\pgfphysicalheight}%
1042    }%
1043  }%
1044  \pgfpageslogicalpageoptions{3}
1045  {%
1046    border shrink=\pgfpageoptionborder,%
1047    border code=\beamerswitch@Border,%
1048    resized width=.5\pgfphysicalwidth,%
1049    resized height=.25\pgfphysicalheight,%
1050    center=\ifbool{HL@beamerswitch@align}{%
1051      \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1052      {.625\pgfphysicalheight - 0.2\beamerswitch@margin}%
1053    }{%
1054      \pgfpoint{.25\pgfphysicalwidth}{.625\pgfphysicalheight}%
1055    }%
1056  }%
1057  \pgfpageslogicalpageoptions{4}
1058  {%
1059    border shrink=\pgfpageoptionborder,%
1060    border code=\beamerswitch@Border,%
1061    resized width=.5\pgfphysicalwidth,%
1062    resized height=.25\pgfphysicalheight,%
1063    center=\ifbool{HL@beamerswitch@align}{%
1064      \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1065      {.625\pgfphysicalheight - 0.2\beamerswitch@margin}%
1066    }{%
1067      \pgfpoint{.75\pgfphysicalwidth}{.625\pgfphysicalheight}%
1068    }%
1069  }%
1070  \pgfpageslogicalpageoptions{5}
1071  {%
1072    border shrink=\pgfpageoptionborder,%
1073    border code=\beamerswitch@Border,%
1074    resized width=.5\pgfphysicalwidth,%
1075    resized height=.25 \pgfphysicalheight,%
1076    center=\ifbool{HL@beamerswitch@align}{%
1077      \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1078      {.375\pgfphysicalheight + 0.2\beamerswitch@margin}%
1079    }{%
1080      \pgfpoint{.25\pgfphysicalwidth}{.375\pgfphysicalheight}%
1081    }%
1082  }%
1083  \pgfpageslogicalpageoptions{6}
1084  {%
1085    border shrink=\pgfpageoptionborder,%
1086    border code=\beamerswitch@Border,%
1087    resized width=.5\pgfphysicalwidth,%

```



```

1088     resized height=.25 \pgfphysicalheight,%
1089     center=\ifbool{HL@beamerswitch@align}{%
1090         \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1091             {.375\pgfphysicalheight + 0.2\beamerswitch@margin}%
1092     }{%
1093         \pgfpoint{.75\pgfphysicalwidth}{.375\pgfphysicalheight}%
1094     }%
1095 }%
1096 \pgfpageslogicalpageoptions{7}
1097 {%
1098     border shrink=\pgfpageoptionborder,%
1099     border code=\beamerswitch@Border,%
1100     resized width=.5\pgfphysicalwidth,%
1101     resized height=.25 \pgfphysicalheight,%
1102     center=\ifbool{HL@beamerswitch@align}{%
1103         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1104             {.125\pgfphysicalheight + 0.6\beamerswitch@margin}%
1105     }{%
1106         \pgfpoint{.25\pgfphysicalwidth}{.125\pgfphysicalheight}%
1107     }%
1108 }%
1109 \pgfpageslogicalpageoptions{8}
1110 {%
1111     border shrink=\pgfpageoptionborder,%
1112     border code=\beamerswitch@Border,%
1113     resized width=.5\pgfphysicalwidth,%
1114     resized height=.25 \pgfphysicalheight,%
1115     center=\ifbool{HL@beamerswitch@align}{%
1116         \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1117             {.125\pgfphysicalheight + 0.6\beamerswitch@margin}%
1118     }{%
1119         \pgfpoint{.75\pgfphysicalwidth}{.125\pgfphysicalheight}%
1120     }%
1121 }%
1122 \fi
1123 }
1124 }

```

## 9.7 Article layout

We provide some options for configuring the appearance of article mode.

The `maketitle` option triggers adjustments in how the title block is printed.

```

1125 \define@boolkey[AL]{beamerswitch}{maketitle}[true]{}

```

One will be to join the title and subtitle with a colon. There is an edge case where, if the user provides a title that ends in ‘!’ or ‘?’ *and* provides a subtitle while this option is in effect, they will end up with clashing punctuation in the middle of the displayed title (‘!.’ or ‘?:’). We therefore introduce a toggle that, if set true, suppresses the additional colon.

```

1126 \newtoggle{titlepunct}

```

Of course, we would rather not bother the user with this, so we introduce a command for testing the title for final punctuation.

The only way I can seem to do this is by switching to `expl3` syntax. Rather than introduce extra hard dependencies to cope with what will probably be quite a rare issue, we make the dependency soft: it will only be applied if `xparse` is available. If there is demand for it, we could introduce a class option to switch this code on or off, but let's see how we go.

```

1127 \IfFileExists{xparse.sty}{\@tempswattrue}{\@tempswafalse}
1128 \if@tempswa
1129   \RequirePackage{xparse}
1130   \ExplSyntaxOn
1131   \NewDocumentCommand{\bsw@punct@test}{m}{\l_bsw_punct_test:n {#1}}
1132   \cs_new_protected:Nn \l_bsw_punct_test:n
1133   {
1134     \str_case:x:nnTF { \str_item:nn {#1} {-1} }
1135     {
1136       { , } { }
1137       { ; } { }
1138       { : } { }
1139       { . } { }
1140       { ! } { }
1141       { ? } { }
1142     }
1143     { \global\toggletrue{titlepunct} }
1144     { \global\togglefalse{titlepunct} }
1145   }
1146   \ExplSyntaxOff

```

We insert this test into the definitions for `\title` introduced by `beamer/beamerarticle`.

```

1147 \mode<article>{%
1148   \renewcommand{\title}[2][\beamer@origtitle{#2}\bsw@punct@test{#2}]
1149 }
1150 \mode<presentation>{%
1151   \long\def\beamer@title[#1]#2{%
1152     \def\inserttitle{#2}%
1153     \def\beamer@shorttitle{#1}%
1154     \bsw@punct@test{#2}%
1155   }
1156 }
1157 \else
1158   \wlog{Beamerswitch: Auto-detection of title punctuation not available.}
1159 \fi

```

We offer some alternatives for handling frame titles in article mode.

- `para` is what `beamerarticle` normally does.
- `margin` puts the frame titles in the margin.
- `none` gets rid of them entirely.

```

1160 \define@choicekey+{AL}{beamerswitch}{frametitles}{para, margin, none}{%
1161   \def\beamerswitch@articleframetitles{#1}%

```

```

1162 }{%
1163   \ClassWarning{beamerswitch}{Value of `frametitles' not recognized.
1164     Allowed values are para, margin, and none.}%
1165 }

```

We provide a command for setting these options.

```

1166 \newcommand{\articlelayout}[1]{%
1167   \setkeys[AL]{beamerswitch}{#1}%

```

The following options are mode specific.

```

1168 \mode<article>{%

```

Personally I find slide titles somewhat intrusive in article mode. They can easily end up duplicating section headings in running text, or captions in figures. You may have other ideas, so we keep this behaviour configurable.

The `margin` value is implemented using `\marginpar`.

```

1169   \ifcsstring{beamerswitch@articleframetitles}{margin}{%
1170     \setbeamertemplate{frametitle}{%
1171       \marginpar[%
1172         \raggedleft\noindent\emshape\textbf{\insertframetitle}\par
1173         \noindent\insertframesubtitle\par
1174       ]{%
1175         \raggedright\noindent\emshape\textbf{\insertframetitle}\par
1176         \noindent\insertframesubtitle\par
1177       }%
1178     }
1179   }{%
1180     \ifcsstring{beamerswitch@articleframetitles}{none}{%
1181       \setbeamertemplate{frametitle}{}
1182     }{%
1183       \ifcsstring{beamerswitch@articleframetitles}{para}{%
1184         \setbeamertemplate{frametitle}[default]
1185       }{}%
1186     }%
1187   }

```

This is where we make our adjustments to `\maketitle`. We start by joining the subtitle to the title by means of a colon instead of a newline.

```

1188   \ifbool{AL@beamerswitch@maketitle}{%
1189     \renewcommand{\subtitle}[2][ ]{%
1190       \def\insertsubtitle{##2}\gappto@title{\iftoggle{titlepunct}{}{:} ##2}%
1191     }

```

We add support for printing the institute information.

```

1192   \ifundef{\beamer@originstitute}{%
1193     \renewcommand{\institute}[2][ ]{\def\insertinstitute{##2}}%
1194   }{%
1195     \renewcommand{\institute}[2][ ]{%

```

```

1196     \def\insertinstitute{##2}\beamer@originstitute{##2}}%
1197 }%

```

Our first change to `\maketitle` itself is to remove the initial vertical space.

```

1198     \def\@maketitle{%
1199         \newpage
1200         \null
1201         \begin{center}%
1202             \let\footnote\thanks
1203             {\LARGE \@title \par}%
1204             \vskip 1.5em%
1205             {%
1206                 \large\lineskip .5em%
1207                 \begin{tabular}[t]{c}%
1208                     \@author
1209                 \end{tabular}\par
1210             }%

```

The other is to add in a row for the institute information.

```

1211         \ifdefvoid{\insertinstitute}{}{%
1212             {%
1213                 \normalsize\lineskip .5em%
1214                 \begin{tabular}[t]{c}%
1215                     \insertinstitute
1216                 \end{tabular}\par
1217             }%
1218         }%
1219         \vskip 1em%
1220         {\large \@date}%
1221     \end{center}%
1222     \par\vskip 1.5em%
1223 }%
1224 }{}%
1225 }%

```

For consistency, if the `maketitle` option has been passed, we change the PDF metadata in the other modes to use the colon convention for joining the title and subtitle.

```

1226     \mode<presentation>{%
1227         \ifbool{AL@beamerswitch@maketitle}{%
1228             \ifbool{beamer@autopdfinfo}{%
1229                 \patchcmd{\beamer@firstminutepatches}{%
1230                     \inserttitle\ifx\insertsubtitle\@empty\else\ - \insertsubtitle\fi
1231                 }{%
1232                     \inserttitle\ifx\insertsubtitle\@empty\else\iftoggle{titlepunct}{}{:}
1233                     ↪ \insertsubtitle\fi
1234                 }{}{}%
1235             }{}%
1236         }%
1237     }

```

There is no more.

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