MAS115 Presentation Lab 6

First steps in Beamer

Start a new project in Overleaf (or use TeXworks/TeXshop/TeXmaker if you prefer). Enter the following, which will work as a very minimal Beamer document.

```
\documentclass{beamer}

\begin{document}
\begin{frame}
Hello!
\end{frame}
\end{document}
```

You should find that you have produced a one-page PDF document which is screen-shaped.

Now let's include a title slide. Put
`\title{My first Beamer document}` in the preamble,
along with your name as author. Before your other frame, put

```
\begin{frame}
\maketitle
\end{frame}
```

You should now have a title page slide, followed by a second
page with 'Hello!' on.

> Unfortunately, the PDF viewer in Overleaf doesn't
> work brilliantly for checking how your presentation will
> look in action. If you want to try out moving through
> the slides, download the PDF and open it in your stan-
> dard PDF viewer.

Now experiment with the following.

1. Change the 'Hello!' text as below, and see what happens.

   ```
   Hello! \pause Welcome to the School of
   Mathematics and Statistics.
   ```

2. What happens if you remove the space between the '!' and the '\'? Put it back in again.

3. Add another sentence introducing the first-year modules for maths students, and include them as an itemized list.

4. Can you get the items in your list appearing one-by-one?

In fact, there is a neat way to get itemized lists appearing one-by-one. Go back to your list, remove any \pause commands you put there, and change \begin{itemize} to \begin{itemize}[<+->]. Make sure that it works.

You may not like the style of bullet point appearing here. If not, try putting \usetheme{Pittsburgh} in your preamble.

Themes

As discussed in the lecture, changing the look of Beamer documents is controlled by themes. If no theme is specified, Beamer uses the `default` theme. Changing the theme is achieved with the \usetheme{...} command, and a list of the standard options can be found at the link below. Try out one or two of them.

`http://deic.uab.es/~iblanes/beamer_gallery`

A related option is the *color theme*. Put \usecolortheme{crane} in the preamble, and see how things change. Try the color theme beaver. If you want an overview of how the Beamer themes look as the color theme is varied, see the Beamer matrix at

http://www.hartwork.org/beamer-theme-matrix

Navigation

You may have noticed that at the bottom of each frame is a set of navigation symbols which you can click on to move you forward and back through slides, frames and sections. Some people like them, but if you want to get rid of them, put the following in your preamble.

```
\setbeamertemplate{navigation symbols}{}
```

Using sections in Beamer documents

You should use sections and subsections to structure Beamer documents just as you have done for articles. The \section{...} and \subsection{...} commands must go between frames, not inside.

Make sure you are using the Warsaw theme, then put in a new section called 'Level 1 modules' between your two frames. Process the file. Any change? (You might need to look carefully.)

Now create a section called 'Level 2 modules' and then make a frame listing the module options for Level 2. Run the file again. Add the command \frametitle{About Level 2} after the \begin{frame} command to give your frame a title, and do the same for the frame about Level 1.

To make the section titles themselves a bit more prominent, try adding the following to your preamble.

\AtBeginSection{\frame{\sectionpage}}

Some people like to show the whole structure of their talk at the start. I'm not keen on it myself, but here's how it's done. Change the \AtBeginSection command to the following.

```
\AtBeginSection{
\begin{frame}
   \frametitle{Outline}
   \tableofcontents[currentsection]
\end{frame}
}
```

Theorems

You can do the usual things with theorems, lemmas and proofs. Beamer already sets up environments for most of them for you. The way that they are displayed depends on which theme is used.

In a new section called 'Famous mathematical results', create a frame with title 'The infinitude of primes' and use the in-built `theorem` environment to state 'There are infinitely many prime numbers'. Start a `proof` environment with 'This is covered in MAS114' in. Pause the frame as you see fit.

If there are any other results that have impressed you in the 6 weeks so far, create another frame for one of those.

Including code

One way we've seen for including computer code is to use the verbatim environment. Create a new section called 'Mathematical scripts' and in a new frame, use the *verbatim* environment to include the following code. Does Beamer work?

```
a = input("Number 1? ")
b = input("Number 2? ")
print("Sum =",a+b)
```

In fact, the verbatim environment causes Beamer some problems. To tell it to be careful with that slide, change the \begin{frame} command to \begin{frame}[fragile]. Now it should work.

Handouts

Change your document class command to
\documentclass[handout]{beamer}. Process the
document. What do you notice? This is a helpful way to print
your slides without printing each paused step.

To get 4 slides on one page, add the following to your
preamble.

```
\mode<handout>{
    \usepackage{pgfpages}
    \pgfpagesuselayout{4 on 1}
        [a4paper,border shrink=5mm,landscape]
}
```

A useful alternative is to turn the slides into a standard LaTeX document. To do this, replace your current document class command with the usual \documentclass{article}, then add
\usepackage{beamerarticle} to your preamble.

Further materials

Overleaf have a really good short guide to making Beamer presentations at

https://www.overleaf.com/learn/latex/beamer

and a comprehensive user-guide for Beamer at

http://www.tex.ac.uk/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf

(or Google 'Beamer manual'). You will find answers to most questions there. I've also added the preamble I used to generate the lecture slides to the course website, so you may find out how to control things a bit there.

Homework

There is no homework this week. Or, rather, the homework is the mini-project which was described in the Week 6 lecture and is also on the course website. If you have finished the lab sheet early, why not start thinking about that?