Freedom from Powerpoint
An introduction to creating clear, structured, & efficient presentations & notes for conferences and lectures with \LaTeX\ and Beamer

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Agenda

- The problem;
- Introduction to A Better Way;
- The Beamer system;
- Fancy stuff;
- Some considerations ‘from the field’.
The **PowerPoint/Word** philosophy ... 

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6. Fonts can go ‘weird’ .. not standard libraries between computers.
The Beamer \LaTeX2ε philosophy ...

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- Idea
- Content
  - Lecturer-notes
  - Slides
  - Student-notes
  - Other … ???
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6. That *shmick* appeal (!) at conferences, and with students ...
Additional features

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  2. Index
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- Automatic generation of features that are impossible with Powerpoint/Word:
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  2. Index
  3. In-presentation navigation tools
- Fancy extensions: ps-tricks, books etc.
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How is this achieved?
Under the hood: The basic document

\documentclass[\textit{options}]{beamer}
\usetheme{Frankfurt}
\title{My Presentation title}
\author{Simon Angus}
\date{\today}
\begin{document}
% \frame{\titlepage}
\section{Introduction}
% \frame{The first slide}
\begin{itemize}
  \item Here is a list of points;
  \item That I am making for the;
  \item Audience to pay attention to;
\end{itemize}
% \frame{The Next slide}
\begin{itemize}
  \item Some more text
  \item \ldots
\end{itemize}
% \frame{The Next slide again}
\section{A Lecture Toolbox}
\section{Extensions and Tricks}
\section{Conclusions}
Once the basic content is written, then the real muscle begins!
This basic format will produce the ‘beamer’ version for presentations (as a .pdf doc, like what I’m showing now);
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In the declaration at the top, we can simply write:

```
1 \documentclass[<options>]{article}
2 \usepackage{beamerarticle}
```

... and the document is made into an article format instantly.
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What about slide-handouts, or transparencies??

```
\documentclass[handout]{beamer}
or,
\documentclass[trans]{beamer}
```
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This is achieved through **overlays**:

\item<2-> This text on the second overlay, and following..
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- Or,
  \only<4>{Only know about this and show it on}
Sending your content to the sausage machines: mode

- Perhaps, rather than having the answers come up on the article mode, you’d prefer to have them only appear for the presentation....
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- **Solution:** write the answers with \texttt{\mode<presentation>}

```
\begin{itemize}
\item Question: What is the derivative of $x^3$?
\item Answer: the derivative is given by the \texttt{sf power-rule} as follows, \[ \frac{d}{dx} x^3 = (3)x^{3-2} = 3x^2 \]
\end{itemize}
```
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\begin{verbatim}
\item Question: What is the derivative of $x^3$?
\mode<presentation>\%
\item Answer: the derivative is given by the $\backslash$sf power–rule as follows,
\%
\[
\frac{d}{dx} x^3 = (3)x^{3-2} = 3x^2
\]
\%
\end{verbatim}

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```latex
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```

- **Question:** What is the derivative of $x^3$?
- **Answer:** the derivative is given by the power-rule as follows,

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\frac{d}{dx} x^3 = (3)x^{3-1} = 3x^2
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A change is ...

- Suppose you are a bit tired of the way things are looking... you would like to get the presentation to look more formal/relaxed/bright/structured etc. etc.
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- See it in Ann Arbor, Cambridge US, Marburg ...

\usetheme{AnnArbor}
\defit{<title>}{<definition>}

**Definition: The Definite Integral**

To find the numerical value of an integral \( \int f(x) \, dx \) over the interval \( x = (a, b) \), where \( b > a \), we calculate the definite integral written,

\[
\int_{a}^{b} f(x) \, dx = \left[ F(x) \right]_{a}^{b} = F(b) - F(a)
\] \hspace{1cm} (1)

where \( b \) and \( a \) are the upper limit of integration and lower limit of integration respectively.
Example (Definite Integrals)

Suppose $f(x) = k(1 - e^x)$, find $\int_a^b f(x) \, dx$ ($k$ is a constant).

\begin{verbatim}
\solveit{\text{Definite Integrals}}{\text{problem}}{\text{solution}}
\% problem
Suppose $f(x) = k(1-e^x)$, find $\int_a^b f(x) \, dx$ ($k$ is a constant).
\% solution
We solve as normal, but being careful of the constant,
\% vis
\% sol
\end{verbatim}
The example class

\solveit{<title>}{<problem>}{<solution>}

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\[
\int_a^b k(1 - e^x) \, dx = k (x - e^x) \bigg|_a^b \\
= k(b - e^b) - k(a - e^a) \\
= k(e^a - e^b + b - a)
\]

\[
\begin{align*}
% problem \\
% \text{Suppose } f(x) = k(1 - e^x), \text{ find } \int_a^b f(x) \, dx \text{ ($k$ is a constant).} \\
% \text{We solve as normal, but being careful of the constant,} \\
% \text{\begin{verbatim}
int^b_a k(1-e^x) \, dx \\
&\& k(left(x - e^x\right)_{over^b_a} \\
&\& k(b - e^b) - k(a - e^a) \\
&\& \text{sol}{k(e^a - e^b + b - a)}
\end{verbatim}}
% vis<2->{% \\
\text{\texttt{\textbackslash eea}}} \\
% \text{sol}
\end{align*}
\]
Don’t go there...!

\alertit{\{<title>\}{<content>}}

Caution!

The definite integral, calculating the area between the function and the x-axis,

\[ \int_a^b f(x) \, dx \]

will give a positive area for regions above the x-axis, but a negative area for regions below the x-axis.
Other useful tools

**Extra-Lecture Notes**  Can be added with
\noteit{<title>}{<note>}
which is a good way to add explanations or descriptions in greater detail (e.g. that may not be adequately covered by the text);

**Chapter References**  Directing a student to the relevant part of the text seems a good way to encourage effective studying habits:
\chap{4.2}

**Highlighting Keywords**  One of the nice things about tag-based writing is that you can collect key terms for an index:
Now this \key{key concept} will be added to the index.
Since the document is written with a **consistent** tagging throughout, it is then possible to grab text that has a specific type:

- Creation of Definition pages (`\def{}{}`);
- And then, formula pages;
- Or Worked solution pages (`\solveit{}{}`)

Or any other regularly used typing.
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Even books of lectures (e.g. QMA).
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- Use of very nice graphical software such as ps-tricks, allows the generation of exact functional pictures (in \LaTeX)
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- Teaching style – presentations, board, notes (multimedia?)??
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- I’m here.