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Presentations in Beamer

The basics

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Outline

- 1 What is Beamer?
- 2 Beamer basics and tips
- 3 Beamer features
- 4 Writing a `.tex` script in Overleaf
- 5 Making a Beamer presentation in Rmarkdown



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What is L^AT_EX?

- L^AT_EX is software for typesetting documents
- It is widely used in the scientific community
- Once you have the software, you can write L^AT_EX scripts in Overleaf, RMarkdown, text files, and other environments



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- Beamer is a document "class" in \LaTeX
- I'm using it right now to make these slides
- Typically, the "article" class is used for creating papers and "beamer" is used for presentations



Why use Beamer?

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Why use Beamer?

- Beamer, like the "article" class, typesets
- This means that once you understand how to use \LaTeX , you don't have to worry about formatting your slides
- Presentation creation goes much faster if you have a lot of mathematical symbols in your content
- Many people in our field and adjacent ones use Beamer to create their presentations



Why not use Beamer?

- When you want to create a **flashy** presentation



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- When you don't have many equations



Why not use Beamer?

- When you want to create a **flashy** presentation
- When you want a lot of control over the formatting and don't want it to be uniform across slides
- When you don't have many equations
- When you're in a rush and you haven't yet mastered Beamer



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Tips for getting started

- It's always faster to start with a pre-made template; there's no need to begin with a blank document



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- Creating your presentation in [Overleaf](#) may be helpful at first so that you can compile quickly to check that your document looks how you want
- Leave yourself time to make your presentation if you are new to \LaTeX ; there is a learning curve
- For this presentation, I started with this [template](#)



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What can we do in Beamer?

- Easily create a title page



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- Easily create an outline



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- Set a theme



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- Insert equations



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What can we do in Beamer?

- Easily create a title page
- Easily create a outline
- Set a theme
- Decide when content shows on the slide
- Insert equations
- Embed images
- Format content into multiple columns



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- Decide when content shows on the slide
- Insert equations
- Embed images
- Format content into multiple columns

I'll show what the last 3 things look like in the presentation.



What can we do in Beamer?

- Easily create a title page
- Easily create a outline
- Set a theme
- Decide when content shows on the slide
- Insert equations
- Embed images
- Format content into multiple columns

I'll show what the last 3 things look like in the presentation. The first few functions I've already used throughout, but I'll show you what "coding" it looks like in a **.tex** file.



Inserting equations

- Writing equations in Beamer is one of the easiest things you can do once you know \LaTeX !



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 $f(x) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{x^2}{2}\right)g.$



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The first way is with in-line text, like so,

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$$

Another way is by using the equation environment:



Inserting equations

- Writing equations in Beamer is one of the easiest things you can do once you know L^AT_EX!
- There are a few different ways to make equations

The first way is with in-line text, like so,

$$f(x; \mu) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$$

Another way is by using the equation environment:

$$f(x; \mu) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right] \tag{1}$$



Inserting equations

You can also make the equation show up without a number,

$$f(x; \mu, \sigma) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$$



Inserting equations

You can also make the equation show up without a number,

$$f(x; \mu, \sigma) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$$

or in multiple lines:

$$\begin{aligned} f(x; \mu, \sigma) &= \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right] \\ &= \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{(x-\mu)^2}{2\sigma^2}\right] \end{aligned}$$



Normal block

Finally, to make equations stand out, you can use these special blocks.



Inserting equations

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Alert block

The pdf for a R.V. X that follows a $N(\mu; \sigma^2)$ distribution is as follows.



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The pdf for a R.V. X that follows a $N(\mu, \sigma^2)$ distribution is as follows.

Examples

$$f(x; \mu, \sigma^2) = \frac{1}{\sigma \sqrt{2\pi}} \exp\left(-\frac{(x - \mu)^2}{2\sigma^2}\right)$$



Embedding images

Adding images to your Beamer presentation is also relatively simple.

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Adding images to your Beamer presentation is also relatively simple. Beamer does the formatting for you, so you just have to make sure your images are a good size for the page.

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Figure: Tree in my backyard

Slides with multiple columns

One of the popular slide layouts in Powerpoint is a slide with multiple columns

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Usually you may want 2 or 3

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Luckily, you can do this in \LaTeX as well.

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Usually you may want 2 or 3

Luckily, you can do this in $\text{A}^{\text{T}}\text{E}^{\text{X}}$ as well.

This is a slide with 2 columns

Slides with multiple columns

Now let's try a slide with 3 columns. The first column here just has a text block.

Slides with multiple columns

Now let's try a slide with 3 columns. The first column here just has a text block.

This column here has a couple of bullet points

Slides with multiple columns

Now let's try a slide with 3 columns. The first column here just has a text block.

This column here has a couple of bullet points
The next column will have a picture

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What does the `.tex` file look like?

Now, I'll show you what everything looks like when written in a `.tex` file in Overleaf!



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Using RMarkdown

Now, I'll show you very briefly what setting up a Beamer presentation in RMarkdown looks like.

