#### Math 291: Lecture 6

#### Dr. Fagerstrom

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February 28, 2019

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#### Debugging



#### Beamer

- Introduction
- Basic Format
- Making it look nice...
- Sectioning
- Themes



- Example Using the Only Command
- Example Using the Onslide Command
- Differences Between Only and Onside
- Covering

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# Outline

- ① Comments from Lab 5
  - Debugging

#### 3 Beamer

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# Comments from Lab 5

- Remember to pay attention to details, like whether the equation is displayed or not.
  - In line: \$...\$
  - Displayed with no equation number: \$\$...\$\$
  - Displayed with equation number: \begin{equation}...\end{equation}
- Remember to do all of the problems.

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# Debugging

- One thing that you will notice as you work with LATEX is that when you are utilizing things like tables, arrays, nested arrays, nested fractions, and delimiters, small mistakes can lead to LOTS of errors.
- To give you a little practice in fixing the sort of errors that arise, I have prepared a sample document that will not compile until several key errors are fixed.
- The file can be found on the files page of our course website (where you got this document)
- Download the file and try compiling it.
- Then debug it (you are done when it compiles with no errors).
- The corrected .tex file will be due in 1.5 weeks.
- So Monday 3/18/19 Lab 6 due
- and Monday 3/25/19 Lab Debugging and Lab 7 due

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# Debugging Hints

- TeXnicCenter tries to 'fix' errors. Sometimes this creates more errors, so the number of errors listed is rarely the actual number of errors.
- If the LATEX compiler gets to a fatal error, it simply stops and doesn't read the rest of the file. In this case, the number of errors is just the number prior to the fatal error.
- I generally find it easier to fix one error at a time than to try to fix all of them at once, largely because later errors might disappear as earlier ones are caught.
- A nice trick is sometimes to just add an extra 'end document' line early, so you can fix one part at a time without worrying about any later errors (the compiler generally doesn't read past the end document command at all).

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# Debugging Hints, continued

 One of the things I want you to get out of this assignment is the importance of compiling early and often when you write your own files! It is much easier to fix errors as they occur than in one bunch at the end.

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#### Introduction to Beamer

- Beamer is a document class that allows you to create Presentations using LATEX.
- This presentation was made using beamer.
- Beamer documents must be built using one of the profiles  ${}^{L}\!T_{E}\!X \! \Rightarrow \mathsf{PDF} \quad \textit{or} \quad {}^{L}\!T_{E}\!X \! \Rightarrow \mathsf{PS} \Rightarrow \mathsf{PDF}$

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#### Basic Format

```
\documentclass{beamer}
\begin{document}
```

```
\begin{frame} frame \\ Content \\ end{frame} \end{frame} \label{frame}
```

```
\begin{frame} frame \\ Content \\ end{frame} \end{frame} \label{eq:content}
```

 $\end{document}$ 

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## Making it look nice

- \frametitle{*Title*}
   Use it just after the begin-frame command.
   Gives the frame a title.
- $\begin{frame}{frame}{}$

\titlepage

 $\ensuremath{\mathsf{nord}}\$ 

Creates a title page.

- \title{ *Title of Presentation*}
- \author{*Author or Presenter*}
- \institute[abbreviated name]{Name of University}
- \date{date}

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#### Sections

- \section{name of section} This tells LATEX where a section starts. This command is put *in between* frames, just before the first frame of the section.
- \subsection{*name of subsection*} Similar to above, again placed between sections.
- You can use as many sections and subsections in a beamer file as you like.
- There are also subsubsections, with the obvious commands.

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## Sections, continued

- Just telling LATEX that you have sections, etc., is not enough.
- You also need to tell LATEX that you want those sections printed out at some point in time.
- There are two obvious places to tell the viewer the sections, etc.
  - At the start of the presentation, in a table of contents.
  - At the start of each section.

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# Sections, Continued

- \begin{frame}
   \tableofcontents
  - $\ensuremath{\mathsf{end}}\frame\}$

(Placed where you want the table of contents to appear, which would generally be just after the titlepage.)

- \AtBeginSection{\begin{frame}
  - $frametitle{Outline}$
  - \tableofcontents[currentsection]
  - $\ensuremath{\mathsf{nord}}\$

(Placed in the preamble.)

This tells Beamer to put a frame with the title "Outline" at the start of each section.

The content of that frame will be the table of contents, but with the current section highlighted.

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#### Comments

- Note that you create only one page at a time.
- There can be no actual content outside of a frame.
- There can be formatting commands, like section names, outside of the frames, however.
- My 'university' in this file includes the website and email address, which is how I got those items onto the title page.
- LATEX uses the .log file as a sort of memory. When you have sections, etc., as LATEX reads the .tex file, when it encounters a section, subsection, etc., it records that information in the .log file. It also reads the .log file for the information used in the table of contents.

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## Comments, continued

- So, if it is both writing to and reading the same file when it compiles, there are issues.
- In particular, when it creates the Table of Contents, it has not yet encountered a begin-section command. So it doesn't think that there are any sections, and gives you an empty table of contents. It populates that information as it continues to read through the file, though.
- So: You need to compile *twice*. Once to correctly populate the .log file, and once for LATEX to correctly use the now-populated data within the document.
- (Note: Later in the semester, we will see other times when we will need to compile twice, for similar reasons.)

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• If you create a file with what we've covered so far, you'll notice that your presentation slides look completely different from both this presentation and those done during previous weeks.

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- If you create a file with what we've covered so far, you'll notice that your presentation slides look completely different from both this presentation and those done during previous weeks.
- That is the default beamer style.

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- If you create a file with what we've covered so far, you'll notice that your presentation slides look completely different from both this presentation and those done during previous weeks.
- That is the default beamer style.
- The theme of the frames can be changed in many ways. It can be done manually, or you can choose from many nice prepackaged beamer themes.

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- If you create a file with what we've covered so far, you'll notice that your presentation slides look completely different from both this presentation and those done during previous weeks.
- That is the default beamer style.
- The theme of the frames can be changed in many ways. It can be done manually, or you can choose from many nice prepackaged beamer themes.
- For your lab, you will pick a single premade theme and just stick with that for now.

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• The following link will take you to a website for the Beamer User Manual. Look on pages 148-162.

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- The following link will take you to a website for the Beamer User Manual. Look on pages 148-162.
- Beamer User Manual

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- The following link will take you to a website for the Beamer User Manual. Look on pages 148-162.
- Beamer User Manual
- The webpage is: http://www.ctan.org/texarchive/macros/latex/contrib/beamer/doc/beameruserguide.pdf
- In the preamble of your lab type: \usetheme{<some cool theme from the list>}.
- Build and see what happens.

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This talk is not using a prepackaged theme. It was created using the inner, outer and font theme commands.

\useinnertheme{rounded}

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## More Themes

This talk is not using a prepackaged theme. It was created using the inner, outer and font theme commands.

- Useinnertheme{rounded}
- \useoutertheme{infolines}

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## More Themes

This talk is not using a prepackaged theme. It was created using the inner, outer and font theme commands.

- \useinnertheme{rounded}
- \useoutertheme{infolines}
- \usefonttheme{structureitalicserif}

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## More Themes

This talk is not using a prepackaged theme. It was created using the inner, outer and font theme commands.

- Useinnertheme{rounded}
- \useoutertheme{infolines}
- \usefonttheme{structureitalicserif}
- \usecolortheme{}

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#### Theme comments

- Even if you use a pre-packaged theme, you can still make modifications to it.
- For example, in my last professional presentation, I used the Cambridge pre-packaged theme, then modified the colors to match the MSUM colors and added the MSUM academic logo.

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## Frame Overlays

- Basically, when you click through a presentation and new content seems to appear (or change) on the current slide.
- Using pdfs on 'scroll' mode obliterates this effect! But it works well when you 'jump' from page to page.
- Most basic tool: The \pause command.
- Other commands: \only<options>{Content}

\onslide<options>{Content}

• (Note that the use of these commands are why the page number in the bottom right corner does not match the page number in the pdf's information bar.)

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The \only<options>{Content} command works as follows. Code (in a *single* frame):

This text is on all slides. \only<1,3>{This text is on slides 1 and 3.} \only<2-4>{This text is on slides 2 through 4.} \only<1,3->{This text is on slides 1, 3 and all subsequent slides.}

Result:

This text is on all slides. This text is on slides 1 and 3. This text is on slides 1, 3 and all subsequent slides.

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The  $\only < options > {Content}$  command works as follows. Code (in a *single* frame):

This text is on all slides. \only<1,3>{This text is on slides 1 and 3.} \only<2-4>{This text is on slides 2 through 4.} \only<1,3->{This text is on slides 1, 3 and all subsequent slides.}

Result:

This text is on all slides. This text is on slides 2 through 4.

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The  $only < options > {Content}$  command works as follows. Code (in a *single* frame):

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Result:

This text is on all slides. This text is on slides 1 and 3. This text is on slides 2 through 4. This text is on slides 1, 3 and all subsequent slides.

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The \only<options>{Content} command works as follows. Code (in a *single* frame):

This text is on all slides. \only<1,3>{This text is on slides 1 and 3.} \only<2-4>{This text is on slides 2 through 4.} \only<1,3->{This text is on slides 1, 3 and all subsequent slides.}

Result:

This text is on all slides. This text is on slides 2 through 4. This text is on slides 1, 3 and all subsequent slides.

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The \onslide<options>{Content} command works as follows. Code (in a *single* frame):

This text is on all slides. \onslide<1,3>{This text is on slides 1 and 3.} \onslide<2-4>{This text is on slides 2 through 4.} \onslide<1,3->{This text is on slides 1, 3 and all subsequent slides.}

Result:

This text is on all slides. This text is on slides 1 and 3. This text is on slides 1, 3 and all subsequent

slides.

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The \onslide<options>{Content} command works as follows. Code (in a *single* frame):

This text is on all slides. \onslide<1,3>{This text is on slides 1 and 3.} \onslide<2-4>{This text is on slides 2 through 4.} \onslide<1,3->{This text is on slides 1, 3 and all subsequent slides.}

Result: This text is on all slides. on slides 2 through 4.

This text is

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The \onslide<options>{Content} command works as follows. Code (in a *single* frame):

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Result:

This text is on all slides. This text is on slides 1 and 3. This text is on slides 2 through 4. This text is on slides 1, 3 and all subsequent slides.

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Result:

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# What are these doing and what are the differences?

- In the code, either one only had code for a single frame, but they each produced four frames.
- Of the four frame produced by the code, the options (the numbers in the angle brackets) told Beamer which of the four frames it was to put specific content on.
- With the 'only' command, the other content was ignored entirely.
- With the 'onslide' command, space was set aside for the other content, but it wasn't made visible.
- With the 'onslide' command, we can make the other content partially visible, though...

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## Covering Transparency

\setbeamercovered{transparent=20}
 This sets the transparency level to 20% (so very light - the lower the number the lighter the visible text)

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Code:

```
\setbeamercovered{transparent=20}
Inductive Proofs consist of three main steps. \\
\onslide<2>{The Base Case}\\
\onslide<3>{The Inductive Hypothesis}\\
\onslide<4>{The Inductive Step}
```

#### Output:

#### Inductive Proofs consist of three main steps.

The Base Case The Inductive Hypothesis The Inductive Step

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Code:

```
\setbeamercovered{transparent=20}
Inductive Proofs consist of three main steps. \\
\onslide<2>{The Base Case}\\
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Output:

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Code:

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Output:

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Inductive Proofs consist of three main steps. The Base Case The Inductive Hypothesis The Inductive Step

Code:

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Inductive Proofs consist of three main steps. \\
\onslide<2>{The Base Case}\\
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```

Output:

Inductive Proofs consist of three main steps. The Base Case The Inductive Hypothesis The Inductive Step

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For an enumerated environment, we have a shortcut as well, that does not use the  $\$ onslide command at all.

\setbeamercovered{transparent=20}
Inductive Proofs consist of three main steps.
\begin{enumerate}
\item <2-4> The Base Case
\item <3-> The Inductive Hypothesis
\item <4> The Inductive Step
\end{enumerate}

Inductive Proofs consist of three main steps.

- The Base Case
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