# An introduction to the LaTeX typesetting language

Jean-Philippe Gauvin
jean-philippe.gauvin@umontreal.ca

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# Overview of the Presentation

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# What is LaTeX?

## Description

LaTeX is a typesetting language used to render documents. It is a macro package based on the TeX language – developed by Leslie Lamport.

The name comes from the letters $\tau$, $\epsilon$ and $\chi$

Its principal uses:

- Rendering high-resolution PDF articles
- Managing references
- Doing presentations (such as this one!)

# The Pros

There are many pros to using LaTeX:

- Very stable
- Lets you focus on the content
- Creates highly portable media (no more compatibility problems!)
- Awesome for equations

$$\frac{\partial Pr(y=1|\mathbf{x})}{\partial x_k} = \frac{\partial F(\mathbf{x}\boldsymbol{\beta})}{\partial x_k} = \frac{dF(\mathbf{x}\boldsymbol{\beta})}{d\mathbf{x}\boldsymbol{\beta}} \frac{\partial \mathbf{x}\boldsymbol{\beta}}{\partial x_k} = f(\mathbf{x}\boldsymbol{\beta})\beta_k$$

- Has a huge Internet community
- Lets you use high-res figures in a native PDF format
- Will satisfy the geek gene

# The Cons

But there are also a few cons:

- Bigger learning curve than most WYSIWYG text processors
- Requires the geek gene to really appreciate it
- Can sometimes be overly terse

| | File | Type | Line | Message |
|---|---|---|---|---|
| > | | Error | line 17 | ! I can't write on file `latex_csdc.pdf'.Please type another file name for output! Emergency stop.\ |
| | | Error | line 1 | ! ==> Fatal error occurred, no output PDF file produced! |

- The reference manager (BibTeX) is often unintuitive

# Debugging the Myths

Like any cult-inducing phenomenon, LaTeX has its share of myths.

- LaTeX is so hard to learn!
- LaTeX is the only way to get published in top-tier journals!
- LaTeX will make you pretentious!

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# How does it work?

There are a few elements to take into account.

- LaTeX is just code, not too dissimilar from HTML.
- Consists of two distinct parts:
  - The preamble: Packages and formatting options
  - The document: Content of the paper
- All commands are embedded in environments starting with `\begin{env}` and ending with `\end{env}`

# The Preamble

All LaTeX documents begin with a preamble where you:

- Specify the document class
- Specify the packages you will need
- Specify the author, title, etc.

# The Document Class

There are multiple document classes that can be useful. Only one can be used per document.

- article
- report
- book
- beamer

The first line of a LaTeX document should always be:
`\documentclass[]{}`

You can also specify options:
`\documentclass[12pt,a4paper]{article}`

# The Packages

Tons of packages can be used with LaTeX.

The most useful are:

```
\usepackage[utf8x]{inputenc} % to use acutes... ()
\usepackage[francais]{babel} % espace avant :, etc.
\usepackage[T1]{fontenc} % to use guillemets
\usepackage{amsmath, amsfonts, amssymb} % used for math
\usepackage{graphicx} % used for figures
\usepackage{fullpage} % used to get 1 inch margins
```

# Titles, etc.

You can specify the title, author names and date.

```
\author{JP Gauvin}
\title{Introduction to \LaTeX}
\date{November 30th 2012}
```

# The body

The body of the document starts with `\begin{document}` and ends with `\end{document}`.

# Specific Commands

```
% is used to comment out the rest of the line
\\ gives a return
\newpage creates a page break
\section{} and \subsection{} identify new sections
`` begins the quote and '' ends it.
   e.g. ``Hello'', he said.)
\ tells LaTeX to print the next character
   e.g. \% \$ \&
$$ embeds a math expression. ex: $e=mc^2$
& is used in tables to identify the vertical line.
```

# Which LaTeX Processor should I use?

Most text processors will allow you to create LaTeX documents. But some softwares are better than others[1].

Here is my top pick:

- For PC:
  - WinEDT
- For Mac:
  - TextMate (approx. $40 for students)
- Crossplatform
  - TeXMaker (best for widescreens)

[1] Remember, you will need to get the source code at http://www.latex-project.org/

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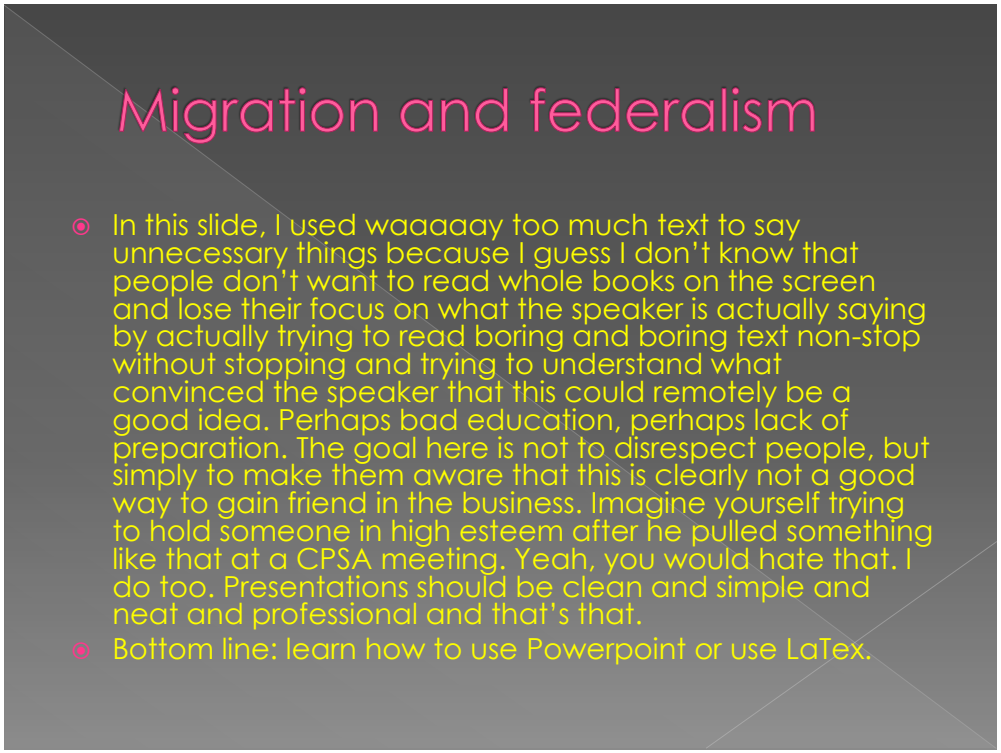
# The Beamer Document Class

The Beamer document class allows you to create powerful presentations. Like normal LaTeX documents, it's defaults are very good. For example, don't use this:



# The Beamer Syntax

Slides in Beamer are created with the frame environment. Here is an example:

```
\begin{frame}{Title of the frame}
    Some text in the frame, followed by items.
        \begin{itemize}
            \item Item 1
            \item Item 2
        \end{itemize}
\ end{frame}
```

# Titles and Table of Content

To create the title, all you need is the `\maketitle` command.

You can use sections (`\section{}`) the same way you would in a normal LaTeX document.

You can then create the table of content with `\tableofcontents`

# The Block command

The Beamer class allows you to use the Block environment. Here is how it works:

**Definition**

What differenciates experiments from other methods is how the data-generating process (DGP) is produced.

```
\begin{block}{Definition}
    What differenciates experiments from other methods
    is how the data-generating process (DGP) is produced.
\end{block}
```

# Other Things to Consider

Most commands used in LaTeX work in Beamer. You should try them out first.

Here are some good references on Beamer:

- Good starter site
- Official documentation
- Another good, complete guide