

LEC 20 : other ways computers
help us do physics

8 JUN '17

LAST TIME : ML (& how you are valuable as
a "computational physicist"
in industry)

MOST OF TERM : HOW python can help w/
research.

TODAY : NOW THAT YOU HAVE RESEARCH,
THEN WHAT?

1. L^AT_EX / B_IB_TE_X
2. A_RX_IV & INSPIRE / ADS
3. GIVING A GOOD TALK

L^AT_EX

↑

↑

"TEK"

"L^AN"
OR
"L^AY"

WHAT: mathematical typesetting.

REPLACEMENT FOR WORD PROCESSING
THAT FACTORIZES CONTENT FROM PRESENTATION
(kind of like what css does for the web)

WHY:

- text based (small files)
- language for math typesetting
- free
- extensible
- platform - independent

LEARNING CURVE

- different language
- not WYSIWYG

BEST WAY TO LEARN?

BY EXAMPLE... ? by GOOGLING FOR HELP!

HOW TO GET IT:

UNIX	- PACKAGE MAN
?	
WIN	- TeXlive / MiKTeX
MAC	- MacTeX (really TeXlive)

% This is a comment

SLASH - COMMAND

\documentclass{article}

\begin{document}

CURLY BRACES: ARGUMENT

Hello World!

\end{document}

\begin{environment} + \end{environment}

stuff inside is marked as

"PROCESS ACCORDING TO THE ENVIRONMENT"

pdflatex — .tex

% Sample Article

% Define some key properties

```
\title{This is a title}
\author{
  Prof. Tanedo\\
  UCR
}
```

% Document starts here

```
\documentclass[12pt]{article}
\begin{document}
```

\maketitle

```
\begin{abstract}
  This is just a sample document.
\end{abstract}
```

```
\section{Introduction}
```

Hello, world!

```
\end{document}
```

COMMANDS TO TAKE THIS DATA
& FORMAT

ABSTRACT ENDS

section

```
% Sample Article
% Document starts here
\documentclass[12pt]{article}
\usepackage{lipsum} % this is a package that outputs text
```

calling a package
(lipsum.sty)

either in your
directory or
your latex path

```
\begin{document}

\title{This is a title}
\author{
  Prof. Tanedo\\
  UCR
}


```

```
\maketitle
```

```
\begin{abstract}
  This is just a sample document.
\end{abstract}
```

```
\section{Stuff}
```

```
Hello, world!
```

```
\lipsum[1-2]
```

```
\section{equations}
```

```
Did you know my favorite equation involves  $\pi$ ? Here it is:
```

```

$$e^{i\pi} = -1$$

```

```
\end{document}
```

math mode

π -- π

$$e^{i\pi} = -1$$

↑ DISPLAY STYLE

```
% Sample Article
% Document starts here
\documentclass[12pt]{article}
\usepackage{lipsum} % this is a package that outputs text
\usepackage{amsmath}
\usepackage{amssymb}
\usepackage{amsfonts}
\usepackage{graphicx}
\usepackage[margin=2cm]{geometry}
```

} standard MATH PACKAGES

```
\begin{document}
```

```
\title{This is a title}
```

```
\author{
  Prof. Tanedo
}
```

```
\maketitle
```

```
\begin{abstract}
```

This is just a sample document.

```
\end{abstract}
```

```
\section{Some equations}
```

```
\begin{align}
```

$F = ma$

$\mathbf{F} = m\mathbf{a}$

$\text{force} = \text{mass} \times \text{acceleration}$

```
\end{align}
```

better than eqnarray

This equation was discovered by someone else~\cite{newton}.

```
\begin{thebibliography}{9}
```

```
\bibitem{newton}
```

Isaac Newton,

Principia,

Cambridge, 1600s or something

```
\end{thebibliography}
```

have to compile twice

```
\end{document}
```

```

% Sample Article
% Document starts here
\documentclass[12pt]{article}
\usepackage{lipsum} % this is a package that outputs text
\usepackage{amsmath}
\usepackage{amssymb}
\usepackage{amsfonts}
\usepackage{graphicx}
\usepackage[margin=2cm]{geometry}


\begin{document}


\title{This is a title}
\author{
    Prof. Tanedo
}


\maketitle


\begin{abstract}
    This is just a sample document.
\end{abstract}


\section{Some references}


As you know from the best paper ever...\cite{test1}.


This was contradicted in the second-best paper ever\cite{test2}.


\bibliographystyle{plain}
\bibliography{test}


\end{document}

```

pdflatex — .tex
 (bibtex —
 → —
 → —

(no .tex)

```
@article{test1,  
  author = "Tanedo, Flip",  
  title = "This is the best paper ever",  
  journal = "Journal of Kicking Butt",  
  volume = "v17",  
  year = "2017"  
}
```

```
@article{test2,  
  author = "Tanedo, Flip",  
  title = "This is the second best paper ever",  
  journal = "Journal of Kicking Butt",  
  volume = "v17",  
  year = "2017"  
}
```