Math 291: Lecture 4

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Comments from Lab 3

List Environments

- The Enumerate Command
- Changing Counters
- The Itemize Command
- Changing Bullets
- The Enumerate Package
- Embedded HTML Links
- 4 The Multicols Package
- 5 Spacing Commands

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Comments from Lab 3

- Pay attention to details: Equation numbers? Italic or upright font? Size? Location?
- Use the posted lecture as a reference. Look things up!
- D2L
- Four-line name block, flush right
- Errors!

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M List Environments

List Environments are useful when writing outlines, sets of numbered problems, and in documents with footnotes and/or reference points. For example:

- An engineer thinks that his equations are an approximation to reality.
- A physicist thinks reality is an approximation to his equations.
- A mathematician doesn't care.
- Or:
 - Q: Why did the chicken cross the Moebius strip?
 - A: To get to the same side!

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The previous slide had examples that incorporated two types of list environments.

- The "enumerate" environment
- The "itemize" environment

We will begin by looking at the "enumerate" environment. The basic outline for a list in the enumerate environment is as follows:

\begin{enumerate}

\item

\end{enumerate}

Note that this is what you have been using on your last two labs. Remember that these may be nested (one inside another). I suggest that you indent inner environments compared to the outer environments in your source code.

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Consider the following list using the enumerate command:

Cartoon Characters Adventure Time Finn 0 Jake Ice King Bob's Burgers Bob Linda Tina Gene Louise 6

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Notes:

You need 3 levels of "nested" enumerate commands for this example. The package used for these slides changes the standard enumerate package, so your results will look a little different when you use the more typical documentclass of article or something similar.

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You can change the default counters used in each list as well. The following commands will change the first counter (whose name is 'enumi') to Roman numerals:

```
\begin{enumerate}
\renewcommand{\labelenumi}{\Roman{enumi}}
\item
\end{enumerate}
```

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Changing Counters

To change the counters at depths 2, 3 and 4, use the commands

\labelenumii, \labelenumiii, and \labelenumiv

The possible counters in the enumerate environment you may use:

- \Roman gives capital Roman numerals.
- \roman

gives lowercase Roman numerals.

• \Alph

gives capital letters.

- \alph gives lowercase letters
- \arabic

gives Arabic numerals (that is, normal numbers)

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Itemized lists are just enumerated lists without "numerical" enumeration. In other programs, they are often called bulleted lists. For example:

• What's a polar bear?

• A rectangular bear, whose coordinates have been changed! The basic outline for an itemized list is:

```
\begin{itemize}
\item
\end{itemize}
```

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To change the "bullets" in your list use the following command

\renewcommand{\labelitemi}{whatever}

The "whatever" is whatever you want your bullets to be. Try experimenting with a two level nested itemization after using the following:

\renewcommand{\labelitemi}{\$\nabla\$}

\renewcommand{\labelitemii}{\$\heartsuit\$}

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<ロ > < 部 > < 画 > < 画 > < 画 > < 画 > < 画 > < 画 > < 画 > < 画 > < 画 > < 画 > < の Q (%) February 21, 2019 13 / 23 List Environments The Enumerate Package



The enumerate package will change the labels in the enumerate environment for you.

If you load the enumerate package in your practice file and then type the following:

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\begin{enumerate}[({Student} A):]

\item This

\item That

\begin{enumerate}[{\$\otimes\$} Line 1:]

\item The other

\item Yet another

\end{enumerate}

```
\item ~
```

\begin{enumerate}[]

\item Note that there is no counter

\end{enumerate}

```
\end{enumerate}
```

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Note that there is no counter

Note also that there is something amiss with the 'Line' counters above. Basically, we should not have ended the curly brace until *after* the word 'Line'.

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- In the package "hyperref" there is a command that allows us to embed hyperlinks into our documents.
- The command is something along the lines of (with appropriate changes to the website and link name):
 \htmladdnormallink{MyWebpage:}{http://web.mnstate.
 edu/fagerstrom}
 [This should all be together on one line]
- The links do not work for all output formats. Usually you have to build to pdf for it to work.

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M The Multicols Package

The multicols package is a package that allows you to create columns on your page without declaring your document to have two columns at the beginning.

The following should give you two columns, each having one element of the list.

```
\begin{enumerate}
\begin{multicols}{2}
\item $f(x)=e^x$
\item $g(x)=\sin(x)$
\end{multicols}
\end{enumerate}
```

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- \newpage
 Does just what you think it does...
- Vertical spacing commands:

\vspace{xunits} \bigskip
\vspace{\stretch{n}} \medskip
\vfill \smallskip

• Horizontal spacing commands:

\hspace{xunits} \. thin \m width of an m
\hspace{\stretch{1}} \; medium \n width of an n
 \: thick ~ hard space
\hfill \! negative thin

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Note that you can also use negative spaces, for example:

You should play with the horizontal and vertical spacing commands and see what happens with each.

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