Math 291: Lecture 4

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Outline

List Environments

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Or:

- Q: Why did the chicken cross the Moebius strip?
- A: To get to the same side!

Enumerate

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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).
To make it easier to read source code, I suggest that you indent inner environments compared to the outer environments in your source code.

An Example:

Practice typesetting the following list using the enumerate command:

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1. Cartoon Characters
    1. Adventure Time
        1. Finn
        2. Jake
        3. Ice King
    2. Bob's Burgers
        1. Bob
        2. Linda
        3. Tina
        4. Gene
        5. Louise

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Notes:
You should have needed 3 levels of "nested" enumerate commands for this example.

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You should have needed 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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\end{enumerate}
```

Try adding this command to your previous enumerated list. Recompile and see what changes occur.

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- `\Roman`
  gives capital Roman numerals.

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  gives capital Roman numerals.
- `\roman`
  gives lowercase Roman numerals.

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The possible counters in the enumerate environment you may use:

- `\Roman`
  gives capital Roman numerals.
- `\roman`
  gives lowercase Roman numerals.
- `\Alph`
  gives capital letters.

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  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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- 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}
```

Changing Bullets

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

```
\renewcommand{\labelitemi}{whatever}
```

The "whatever" is whatever you want your bullets to be.

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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}{$\heartsuit$}
```

The Enumerate Package

The enumerate package will change the labels in the enumerate environment for you.
Load the enumerate package in your practice file and then type the following.

```
\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}
```

Outline

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.

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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.
In your preamble type

```
\usepackage{multicol}
```

Using Multicols

Type the following in your practice file:

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

(Alternatively, modify your previous practice list in a similar fashion as above.)

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- Add the package "hyperref" to the list of packages after the "usepackage" command.
- Now try adding the following commands to the body of your example document:
  \htmladdnormallink{MyWebpage:}{http://web.mnstate.edu/fagerstrom}
  [This should all be together on one line]
  Compile and see what happens.

Outline

Blank Spaces (I'll Write Your Name)

In your document after the last thing you typed before the end document command, type the following

```
\newpage
```

Blank Spaces (I'll Write Your Name)

In your document after the last thing you typed before the end document command, type the following

```
\newpage
```

We will play with spacing on a new page. Type the following into your page.
This
That
and
The other

Vertical Space

The following commands allow you to create vertical space between objects on your page.

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

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

Between the first two lines of your document, put a 1 inch space. Put a 2 inch space between the next two lines.

Vertical Space

The following commands allow you to create vertical space between objects on your page.

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

Between the first two lines of your document, put a 1 inch space.
Put a 2 inch space between the next two lines.
Now try the stretching command. Put in three of the commands, one between each of the four lines. Choose whatever values you want for n, but make sure you make some of them different. Then compile and see what happens.

Horizontal Space

The commands for horizontal space are similar to those for vertical space.

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```
\hspace{xunits}
\hspace{\stretch{1}}
\phantom{}
\hfill
\. thin
\; medium
\: thick
\! negative thin
\m width of an m
\n width of an n
~ space but no break
```

Space the Final Frontier

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

```
\hspace{-1in}
```

Play with the horizontal and vertical spacing commands and see what happens with each.