LaTeX for Mathy Endeavors

(Somewhat) Advanced LaTeX (and Related Matters)

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Section 1

Introduction

Introduction

- We'll talk through some basic LaTeX workflow.
- Common tools and patterns within LaTeX.
- I'll mention what I consider the most useful packages and tools.
- We'll see many examples.
- We'll look at making presentations in LaTeX with BEAMER.
- Some general comments on support tools and typography.

Section 2

General LaTeX

Outline

General Principles

- The layout of documents is profoundly complicated.
- (If you don't think so, then you're wrong.)
- Thousands of people who care about typesetting have tried to make LaTeX's default behavior at least *acceptable*.
- Unless you have made a study of typography, LaTeX's default behavior is very likely better than your desired behavior.
- In general, trust LaTeX. Your life will be better for it.

Separation of Roles: Document Author

While writing a document:

- You shouldn't be concerned with its eventual layout.
- You should be concerned with expositional clarity.
- You should remember that your .tex files have three classes of audiences.
  1. The PDFTeX / XeTeX / LuaTeX typesetting engine.
  2. Your collaborators (even if you don't presently have any).
  3. Your future self.
- The second two audiences benefit from easy to read .tex files where your intent is obvious.

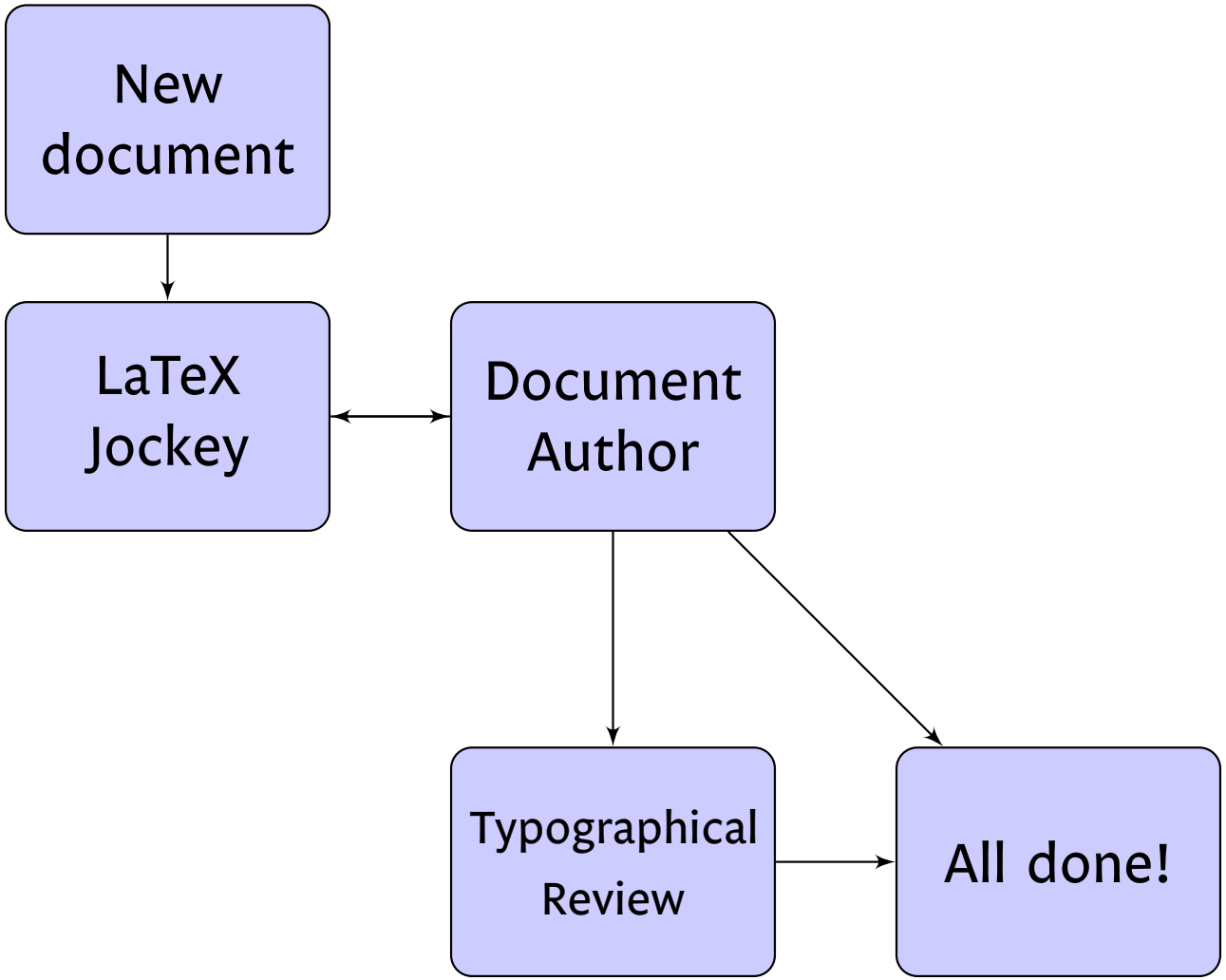
Separation of Roles: LaTeX Jockey

- A LaTeX environment must be set up.
- A document class must be selected and configured.
- Almost any non-trivial document requires some macros.

Separation of Roles: Final Typographical Review

- Most documents never really get treated this way.
- It's madness to make small typographical tweaks prior to the finalized document.
- Final spacing / pagination review.
- Make sure that the document pagination doesn't interfere with the reader's task.
- Comment why you make tweaks, and make it so that you can search out these tweaks.

Role Workflow



Outline

Macros

- Macros bridge the gap between author intent and how it's typeset.
- Your main goals should be
  - Structuring the macro so that it's obvious how to use it.
  - Making it read well in code.
- Notation details are easy to modify later (change it in one place).
- Math has *many* conflicting notations, and macros help you move between them.
- Changing the macro interface is painful. Every place the macro is used must be updated.

A Simple Macro Example

Example

"The positive real numbers":

```
\newcommand{\thepositivereals}[{ \mathbb{R}^+ }
```

The code:

```
As $\varepsilon \in \thepositivereals$, we are done.
```

becomes:
As $\varepsilon \in \mathbb{R}^+$, we are done.

A Macro with Parameters Example

Example

"The index of H in G":

```
\newcommand{\groupindex}[2]{ \left[ #2 : #1 \right] }
```

The code:

```
And we see that the $\groupindex{H}{G}$ is $3$.
```

becomes:
And we see that the $[G : H]$ is 3.

Name your macro and order its parameters so that reading LaTeX code using the macro sounds like reading the typeset math.

Outline

Describe the Document Structure

- Make use of the `\section` and `\subsection` commands.
- If you don't like the formatting of the title sections, you can alter the default formatting.
- This allows you to use references (more later).
- This allows LaTeX to typeset your document more intelligently.
- This will make it easier to conform to some future style set (e.g., from a journal).

An Example Article: Source

Example

```
\documentclass[12pt]{article}
\usepackage{lipsum}

\begin{document}
\title{Lorem Ipsum}
\author{Marcus Tullius Cicero}
\date{1st Century BC}
\maketitle
\begin{abstract}
\lipsum[1]
\end{abstract}

\section{First Section}
\lipsum[2]

\subsection{First Subsection}
\lipsum[3]

\end{document}
```

An Example Article: Compiled

Lorem Ipsum

Marcus Tullius Cicero

1st Century BC

Abstract

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

1 First Section

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

1.1 First Subsection

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Outline

References Within a Document

- Almost anything (sections, tables, figures, etc.) in LaTeX can be given a label with `\label{ marker }`
- You can then refer to these elsewhere in the document using `\ref{ marker }` or `\pageref{ marker }`.
- Note that references will generally require (at least) two compilations.
- There are several programs to help out the re-compile process:
  - If you use MiKTeX, you can use the program `texify`.
  - `latexmk`
  - `rubber`

References Example: Code

Example

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

\begin{document}
\section{First Section}
\label{section:first}
As we'll further develop in section \ref{section:firstsubsection},
we'll see this is evidently true.
We'll return to this theme in section \ref{section:secondsection}.
\subsection{First Subsection}
\label{section:firstsubsection}
We returned to the theme present in section \ref{section:first}
earlier than expected!
\section{Second Section}
\label{section:secondsection}
On page \pageref{section:first}, we first encountered the topics
that we now go on to develop.
\end{document}
```

1 First Section

As we'll further develop in section 1.1, we'll see this is evidently true. We'll return to this theme in section 2.

1.1 First Subsection

We returned to the theme present in section 1 earlier than expected!

2 Second Section

On page 1, we first encountered the topics that we now go on to develop.

Outline

Getting Bibliographic Information

1. Assemble your bibliographic entries yourself.
   - Get the physical publication.
2. Get bibliographic information from reputable sites (e.g., MathSciNet).
3. In any case, manually check your references!

General Guidelines

- Don't use shortened journal names in your bibliography.
  - Who will know that "Gött. Nachr. (1919)" is really "Nachrichten von der Königlichen Gesellschaft der Wissenschaften zu Göttingen, Mathematisch-physikalische Klasse aus dem Jahre 1919"
- Do include MR codes, ideally the modern version.
- Do include URLs where useful, but be aware that URLs are transitory.
- Write the author's name as they do in the paper you cite. (e.g., "Gauss" vs "Gauß")
- Include AMS standard romanizations, but reference alternate depictions of the name for clarity. (e.g., Chebotarev vs Chebotaryov vs Chebotarëv vs Чеботарёв vs Чоботарьов)
- Languages change, but old documents do not.

Bibliography Example: bib file

Example

```
@book{LidlNiederreiter1997,
    author={Rudolf Lidl and Harald Niederreiter},
    title={Finite Fields},
    publisher={Cambridge University Press},
    year={1997}
}

@incollection{LauderWan2008countingpoints,
    author = {Alan G. B. Lauder and Daqing Wan},
    title = {Counting points on varieties over finite fields of small
    characteristic},
    booktitle = {Algorithmic Number Theory},
    editor = {J.P. Buhler and P. Stevenhagen},
    pages = {579 - 612},
    organization = {Mathematical Sciences Research Institute
    Publications},
    publisher = {Cambridge University Press},
    year = {2008}
}
```

Bibliography Example: tex file

Example

```
\documentclass[12pt]{article}
\bibliographystyle{plain}

\begin{document}
\section{First Section}
\label{section:first}
A good math book \cite{LidlNiederreiter1997}, a rainy day
and a pot of tea.

I translated one of Uchiyama's 1954 papers \cite{MR0068581},
though I don't speak French (or Japanese).

My image set counting algorithm was originally based on Lauder and Wan's
point counting algorithm \cite{LauderWan2008countingpoints}, but this
algorithm is no longer the fastest general purpose algorithm known.
\bibliography{small}
\end{document}
```

Bibliography Example: Results

1 First Section

A good math book [2], a rainy day and a pot of tea.

I translated one of Uchiyama's 1954 papers [3], though I don't speak French (or Japanese).

My image set counting algorithm was originally based on Lauder and Wan's point counting algorithm [1], but this algorithm is no longer the fastest general purpose algorithm known.

References

[1] Alan G. B. Lauder and Daqing Wan. Counting points on varieties over finite fields of small characteristic. In J.P. Buhler and P. Stevenhagen, editors, *Algorithmic Number Theory*, pages 579 – 612. Cambridge University Press, 2008.

[2] Rudolf Lidl and Harald Niederreiter. *Finite Fields*. Cambridge University Press, 1997.

[3] Saburô Uchiyama. Sur le nombre des valeurs distinctes d'un polynôme à coefficients dans un corps fini. *Proceedings of the Japan Academy*, 30:930–933, 1954.

Section 3

Useful Environments and Packages

Outline

Theorem environment

- The amsthm package provides a way to specify the formal definitions / theorems / proofs in your work.
- This is the `theorem` environment.
- You specify what you want to call the environment (Theorem, Proposition, Lemma, etc.)
- It keeps track of numbering. (There are options, obviously)

Theorem Example: Code

Example

```
\documentclass[12pt]{article}
\usepackage{amsthm}
\newtheorem{theorem}{Theorem}
\begin{document}
\begin{theorem}
\label{theorem:soggyspain}
The rain in Spain falls mainly in the plain.
\end{theorem}
\begin{proof}
Where is that soggy plain? IN SPAIN! IN SPAIN!
\end{proof}

As theorem \ref{theorem:soggyspain} shows us, all rain falls in
Spain (up to an additive constant).
\end{document}
```

Theorem Example: Result

Theorem 1. *The rain in Spain falls mainly in the plain.*

Proof. Where is that soggy plain? IN SPAIN! IN SPAIN! □

As theorem 1 shows us, all rain falls in Spain (up to an additive constant).

The booktabs package and tabular environment

- There are many ugly tables in the world.
- You don't need to make it worse!
- The default LaTeX tabular environment doesn't do spacing very well.
- It encourages rather bad behavior.

Table Etiquette

- Never use vertical rules.
- Never use double rules.
- Put units in the column heading.
- Always proceed a decimal by a number (0.1, not .1).
- Do not use “ditto” signs, or their analog.

booktabs tabular example: Code

Example

```
\begin{table}[h]
\centering
\caption{Left and right cosets of $H = \{(1), (12) \} < S_3$}
\begin{tabular}{c c c}
\toprule
$\sigma$ & $\sigma H$ & $H \sigma$ \\
\midrule
$(1)$ & $H$ & $H$ \\
$(1 2)$ & $H$ & $H$ \\
$(1 3)$ & $\{ (1 3), ( 1 2 3) \} = H_2 $ &  $\{ (1 3), (1 3 2) \} = {}_2H $ \\
$(2 3)$ & $\{ (2 3), ( 1 3 2) \} = H_3$ &  $\{ (2 3), (1 2 3) \} = {}_3H$ \\
$(1 2 3)$ & $\{ (1 2 3), (13) \} = H_2 $ &  $\{ (1 2 3), (23) \} = {}_3H$ \\
$(1 3 2)$ & $\{ (1 3 2), (23) \} = H_3$ &  $\{ (1 3 2), (13) \} = {}_2H$ \\
\bottomrule
\end{tabular}
\end{table}
```

booktabs tabular example: Result

Table : Left and right cosets of $H = \{(1), (12)\} < S_3$

σ	σH	$H\sigma$
(1)	H	H
(12)	H	H
(13)	$\{(13), (123)\} = H_2$	$\{(13), (132)\} = {}_2H$
(23)	$\{(23), (132)\} = H_3$	$\{(23), (123)\} = {}_3H$
(123)	$\{(123), (13)\} = H_2$	$\{(123), (23)\} = {}_3H$
(132)	$\{(132), (23)\} = H_3$	$\{(132), (13)\} = {}_2H$

Outline

The geometry package

- Provides a reasonable way to change your margins.
- If you want to change your margins, use this package.
- `\usepackage[top=1in,bottom=1in,left=1in,right=1in]{geometry}`
- It may not be clear how wonderful this is if you've never tried to do this manually...

The fancyhdr package

- Can be used to provide information in headers and footers.
- Please use with judgement.
- It's easy to make your page much too busy looking.

fancyhdr Example

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

The hyperref package

- Automatically makes LaTeX references into hyperlinks that can be clicked on.
- Makes URLs (set using `\url`) into hyperlinks that can be clicked on.
- Allows you to embed PDF authorship information (and other metadata).

The comments package

- Allows you to treat blocks of text as a comment.
  - Start block with `\begin{comment}`.
  - End block with `\end{comment}`.
- Allows for deactivating unused code that you may later want.
- Allows you to provide detailed comments, which may be useful because:
  - Complicated LaTeX can be difficult to parse, and you may want to be able to determine what you did later (and why).
  - Your collaborators need to know what you intended.

Outline

TikZ/PGF and LaTeX generated figures

- You can spend time learning many different specialized diagram LaTeX languages...
- That will each fail you, generally at the worst possible time...
- Alternately, you can learn one rather complicated environment that can do almost everything well.
- I suggest that you learn TikZ and PGF.
- Examples: `http://www.texample.net/tikz/examples/`

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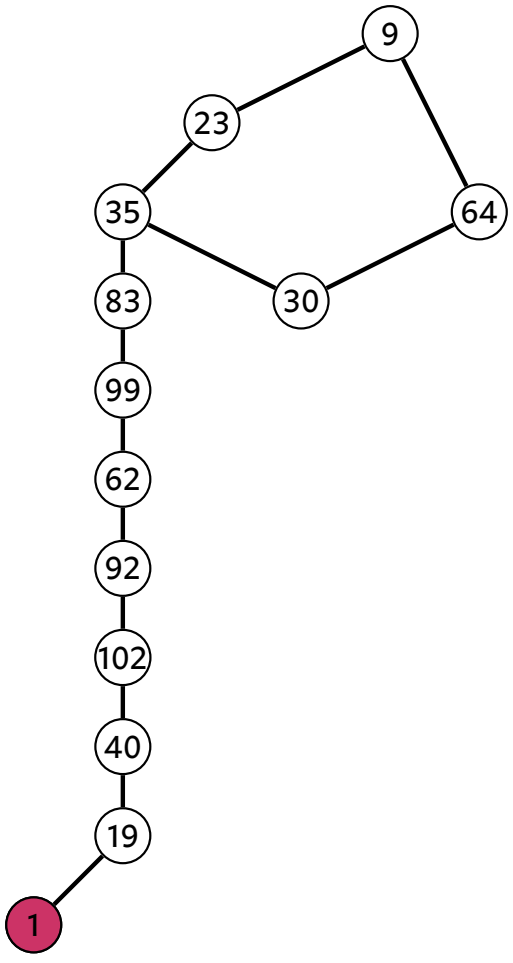

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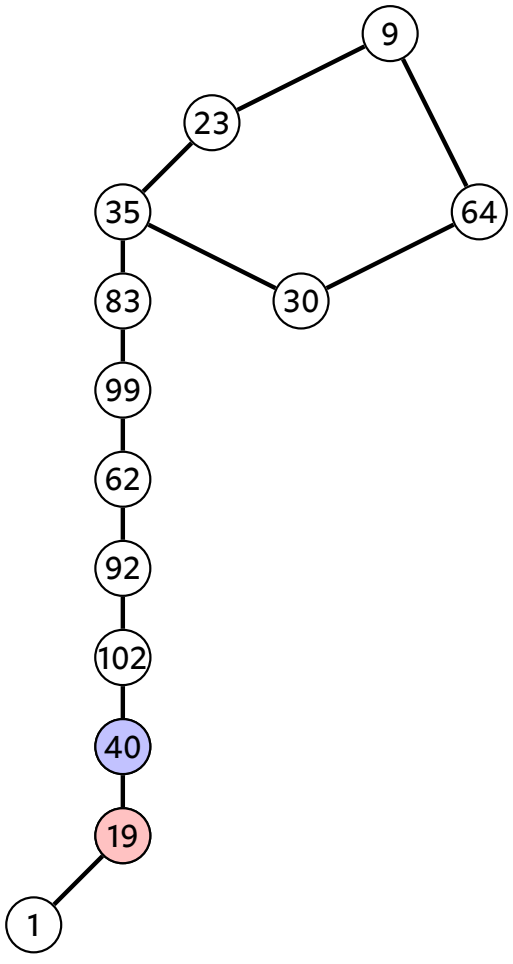

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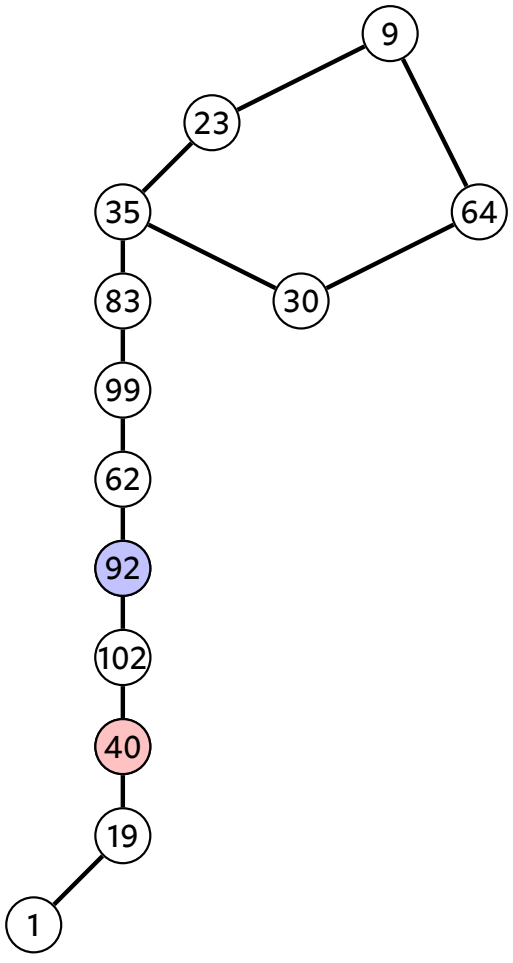

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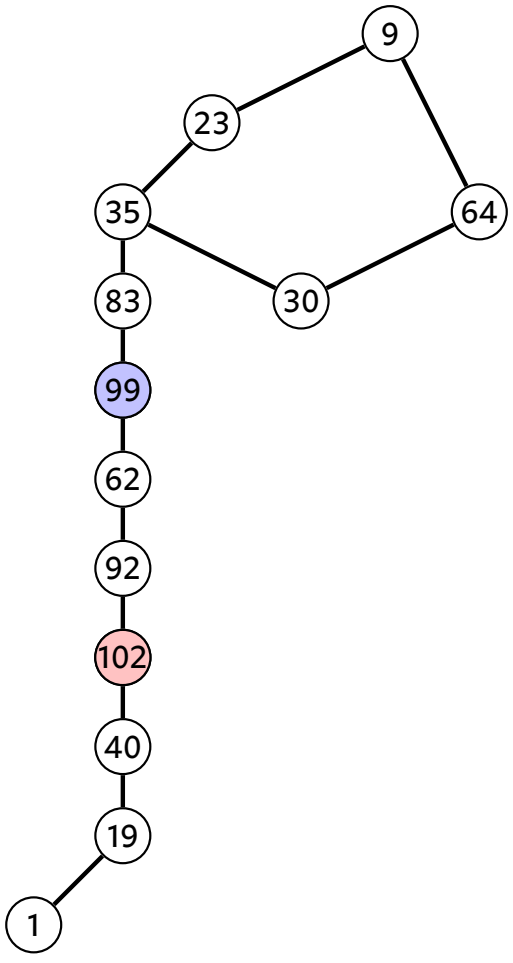

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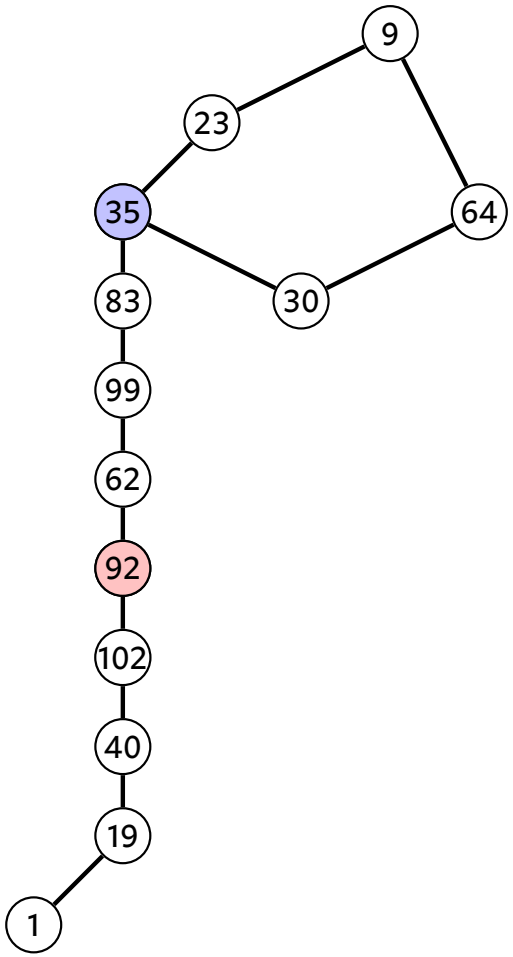

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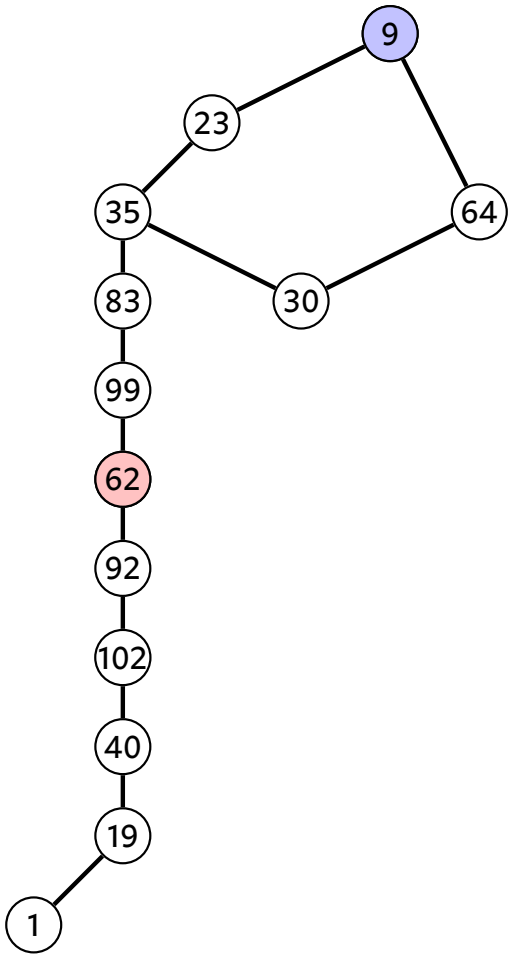

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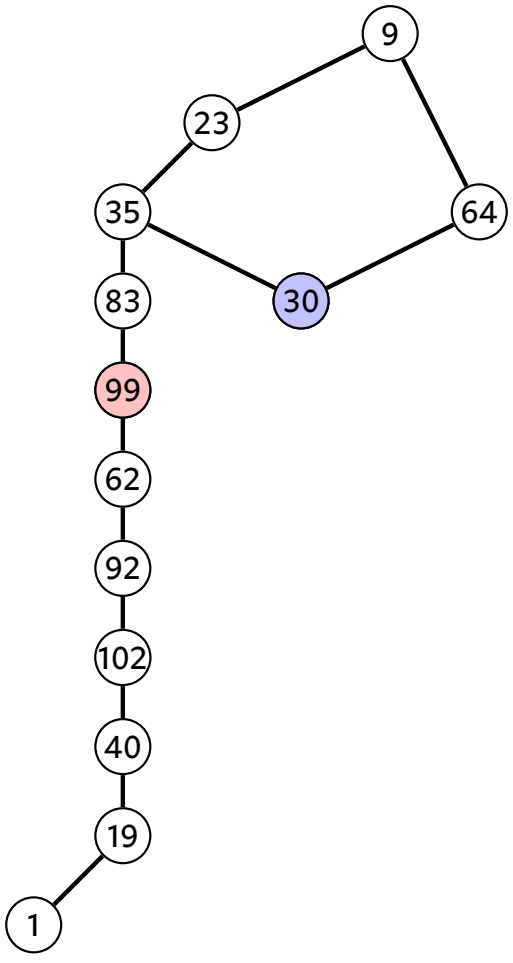

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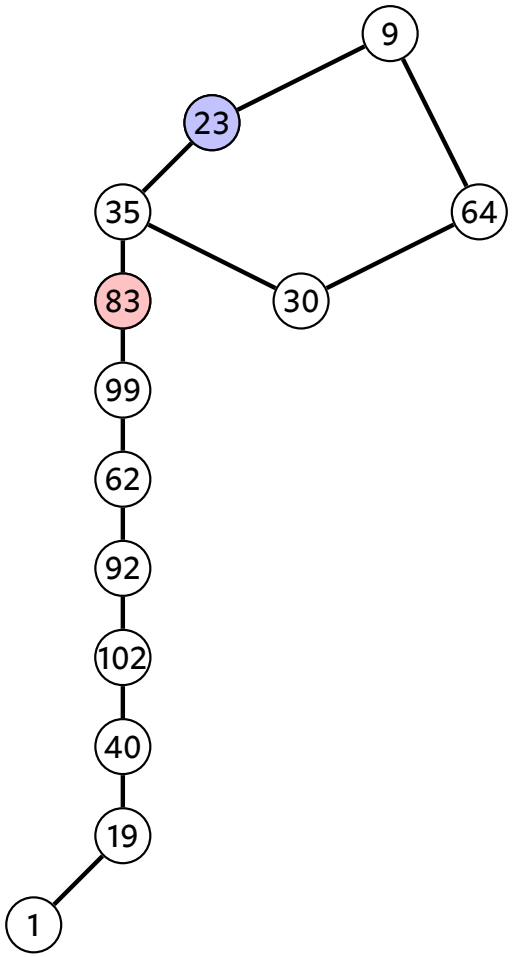

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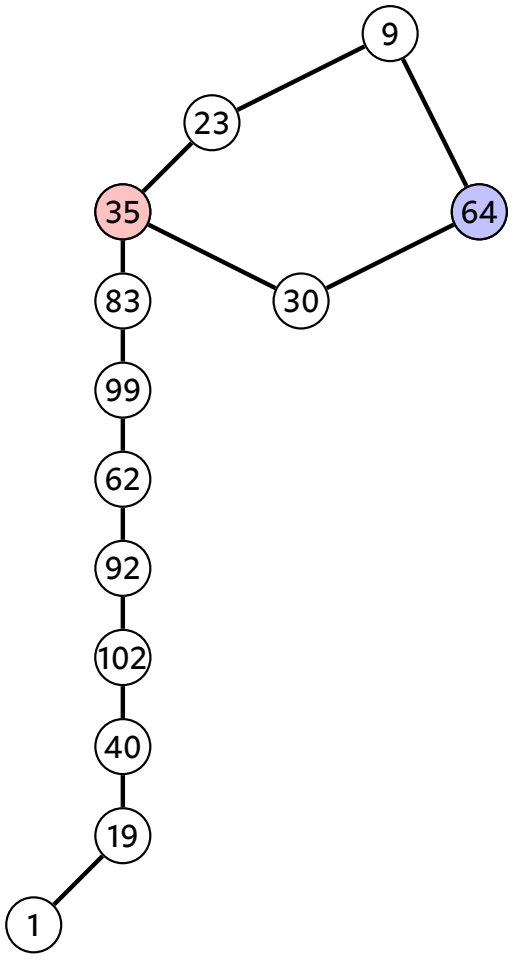
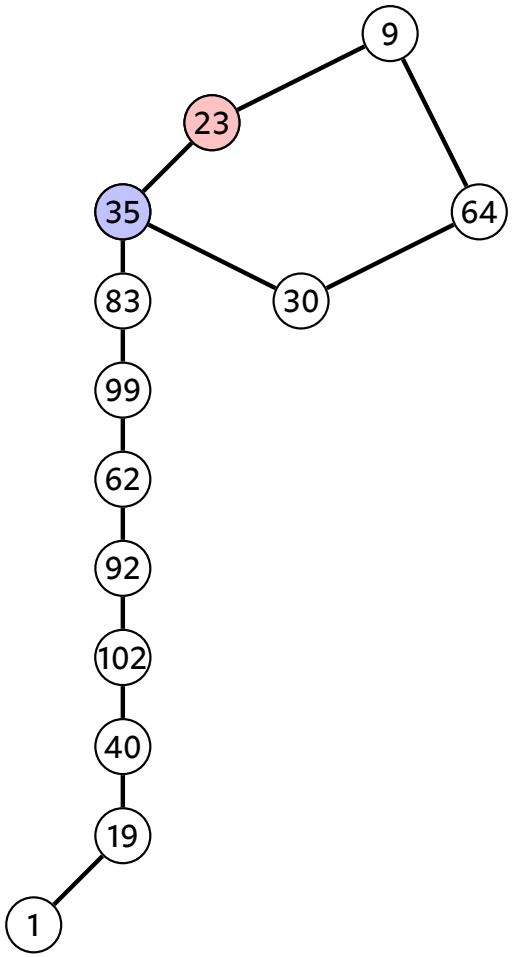
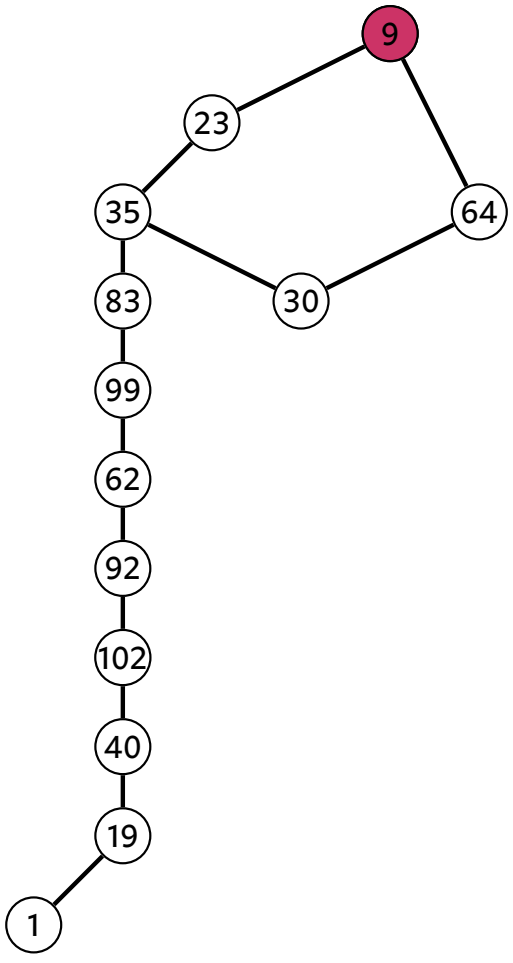


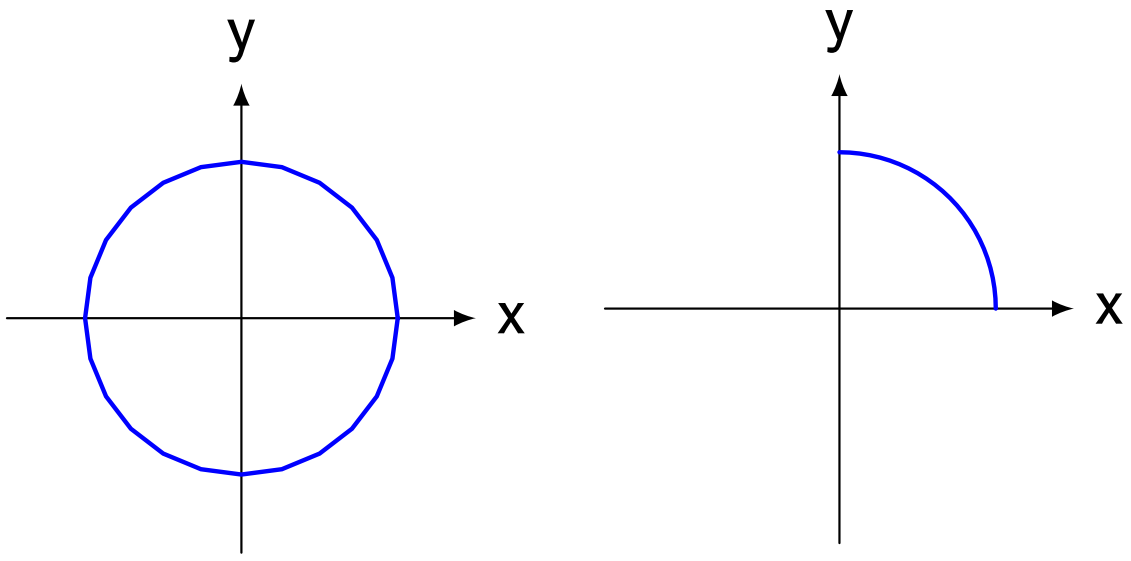
ρ, ρ, ρ your



ρ, ρ, ρ your boat...

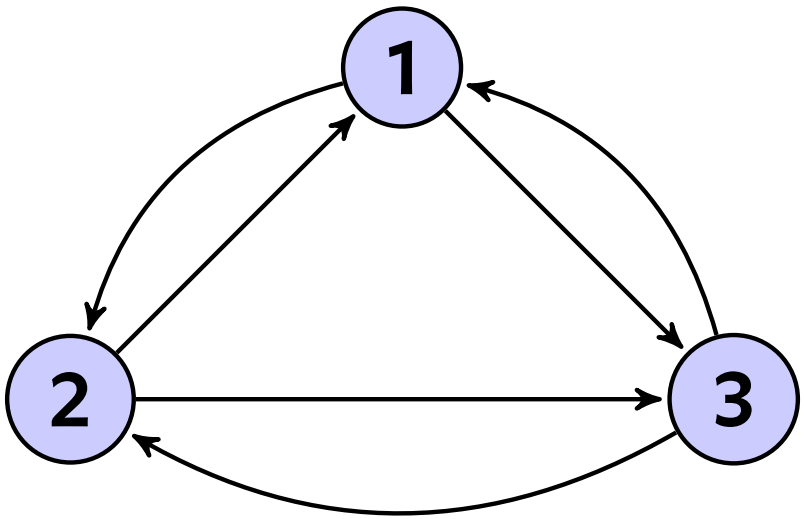


A static example (using subfigure)

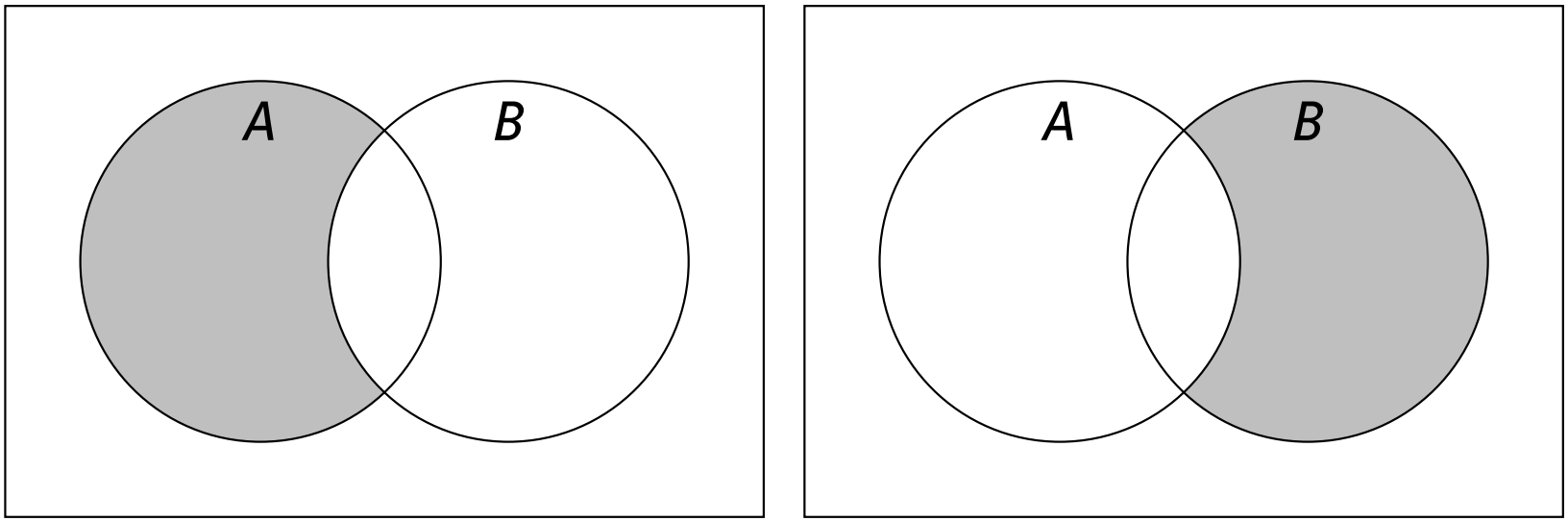


(a) The relation f (b) The function $\hat{f}$

A Graph



A Venn Diagram (also using subfigure)



(a) $A - B$ (b) $B - A$

Section 4

LaTeX Classes

Outline

Article: What if I told you...

- Most of the examples used thus far are from the article document class.
- What follows are some non-standard looking examples.

Article II: Invitation

As a Distinguished Member of the Mathematics Graduate Program,

You (and a Guest) are Cordially Invited to

A Plea for Man

6pm on Friday August 5th, 2011
at the Palo Verde Community Center.

An Evening of Entertainment Featuring:

Amused to Death by Roger Waters
Children of Men directed by Alfonso Cuarón
Ein deutsches Requiem by Johannes Brahms

Refreshments Served:

Willful Ignorance,
Whiskey Induced Numbness,
and
Merciful Oblivion.

Répondez S'il Vous Plait

hillje@math.uci.edu

Article III: Birth Announcement

Joshua Erin Hill

&

Laura Michelle Fulton

are proud to announce
the birth of their daughter

Amélie Sophia Hill

---

at 10:10am on Wednesday
November 23rd, 2011

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Outline

Letter: Everyone Needs to Send One at Some Point

- You will likely need to create letters at some point in your career.
- You've likely become accustomed to nice looking documents…
- MS Word doesn't produce nice looking documents… ever…
- LaTeX to the rescue!

Letter: An Open Letter to the Kansas School Board

PO Box 1111
Irvine, Ca 92616-1111
(555) 555-1111
mail@example.com

March 3, 2014

Kansas School Board
900 SW Jackson St
Topeka, KS 66612

Dear Sir or Madam,

I am writing you with much concern after having read of your hearing to decide whether the alternative theory of Intelligent Design should be taught along with the theory of Evolution. I think we can all agree that it is important for students to hear multiple viewpoints so they can choose for themselves the theory that makes the most sense to them. I am concerned, however, that students will only hear one theory of Intelligent Design.

Let us remember that there are multiple theories of Intelligent Design. I and many others around the world are of the strong belief that the universe was created by a Flying Spaghetti Monster. It was He who created all that we see and all that we feel. We feel strongly that the overwhelming scientific evidence pointing towards evolutionary processes is nothing but a coincidence, put in place by Him.

It is for this reason that I'm writing you today, to formally request that this alternative theory be taught in your schools, along with the other two theories. In fact, I will go so far as to say, if you do not agree to do this, we will be forced to proceed with legal action. I'm sure you see where we are coming from. If the Intelligent Design theory is not based on faith, but instead another scientific theory, as is claimed, then you must also allow our theory to be taught, as it is also based on science, not on faith.

Some find that hard to believe, so it may be helpful to tell you a little more about our beliefs. We have evidence that a Flying Spaghetti Monster created the universe. None of us, of course, were around to see it, but we have written accounts of it. We have several lengthy volumes explaining all details of His power. Also, you may be surprised to hear that there are over 10 million of us, and growing. We tend to be very secretive, as many people claim our beliefs are not substantiated by observable evidence.

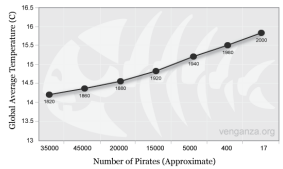
What these people don't understand is that He built the world to make us think the earth is older than it really is. For example, a scientist may perform a carbon-dating process on an artifact. He finds that approximately 75% of the Carbon-14 has decayed by electron emission to Nitrogen-14, and infers that this artifact is approximately 10,000 years old, as the half-life of Carbon-14 appears to be 5,730 years. But what our scientist does not realize is that

every time he makes a measurement, the Flying Spaghetti Monster is there changing the results with His Noodly Appendage. We have numerous texts that describe in detail how this can be possible and the reasons why He does this. He is of course invisible and can pass through normal matter with ease.

I'm sure you now realize how important it is that your students are taught this alternate theory. It is absolutely imperative that they realize that observable evidence is at the discretion of a Flying Spaghetti Monster. Furthermore, it is disrespectful to teach our beliefs without wearing His chosen outfit, which of course is full pirate regalia. I cannot stress the importance of this enough, and unfortunately cannot describe in detail why this must be done as I fear this letter is already becoming too long. The concise explanation is that He becomes angry if we don't.

You may be interested to know that global warming, earthquakes, hurricanes, and other natural disasters are a direct effect of the shrinking numbers of Pirates since the 1800s. For your interest, I have included a graph of the approximate number of pirates versus the average global temperature over the last 200 years. As you can see, there is a statistically significant inverse relationship between pirates and global temperature.

Global Average Temperature Vs. Number of Pirates



In conclusion, thank you for taking the time to hear our views and beliefs. I hope I was able to convey the importance of teaching this theory to your students. We will of course be able to train the teachers in this alternate theory. I am eagerly awaiting your response, and hope dearly that no legal action will need to be taken. I think we can all look forward to the time when these three theories are given equal time in our science classrooms

across the country, and eventually the world; One third time for Intelligent Design, one third time for Flying Spaghetti Monsterism (Pastafarianism), and one third time for logical conjecture based on overwhelming observable evidence.

Thank you for your time and consideration.

Sincerely Yours,

Bobby Henderson, concerned citizen.

Outline

Moderncv: A Résumé for a Pigeon

André Quickwing Pigeon

Résumé

No bird soars too high if he soars with his own wings.
– William Blake

Education

2005–2007 **Bachelor of Science in Aviation**, *Birdy Fly University*, Capistrano.

2007–2009 **Masters of Science in Flying and Stuff**, *Birdy Fly University*, Capistrano.

Experience

Flying Services and Begging, Inc. (Newport Beach, California): A small bird firm (2–5 Birds), specializing in air modeling, bird health risk assessment, spinning death blades, and pool monitoring.

2008–2010 **Avian Consultant**.

2010–2013 **Senior Avian Consultant**.

2013– **Contractor**.
Continuing responsibilities associated with *Flying Services and Begging, Inc.* projects after company-wide full staff layoff.

Relevant Professional Projects

- **Flying and Bobbing About**
  - Flying to the left and to the right. Navigation by magnetic and light polarization. Delivery of messages in a time of war. Awarded medal for valor.
- **Stalking Toddlers for Their Food**
  - This one time, a toddler had a sandwich, and I scared him by flying into his face. He dropped the sandwich and I got the whole freaking thing!. It was beautiful!
  - Two words: Funnel Cake.
- **Adhering to Rock Walls**
  - I can hold like I was born on a freaking rock wall.

Relevant Academic Projects

- Trained on a limited set of paintings: when the shown painting was a Picasso, I was able to obtain food by repeated pecking; when it was a Monet, pecking had no effect. After a while, I would only peck when shown Picasso paintings. I was then able to generalize, and correctly discriminate between paintings of the two painters not previously shown, and even between cubist and impressionist paintings (cubism and impressionism being the two stylistic schools Picasso and Monet belong to). In a later paper, Watanabe showed that if pigeons and human college students undergo the same training, their performance in distinguishing between Van Gogh and Chagall paintings is comparable.
- In Project Sea Hunt, a US coast guard search and rescue project in the 1970s/1980s, I was shown to be more effective than humans in spotting shipwreck victims at sea

P.O. Box 1111, Irvine, CA 92616–1111
(555) 555–1111 • mail@example.com

Computer skills

Productivity Excel, Word, Powerpoint, Photoshop.

Certifications

Professional Pigeon PP 445215, September 2010

References

Professional

- Pigeon #1301,
  Flying Services and Begging, Inc.
  (555) 555–1111
- Pigeon #764 ,
  Fly Boys, Inc.
  (555) 555–1235

Academic

Dr. Sakamoto S. Watanabe,
Keio University
(555) 555–5555

P.O. Box 1111, Irvine, CA 92616–1111
(555) 555–1111 • mail@example.com

Outline

Section 5

Presentations using BEAMER

General Guidelines

- Make your slides easy to read.
- Include a small amount of information per slide. (Plan on about a minute per slide)
- Color scheme: Easy to read, and don't make their eyes bleed.
- Give them a sense of how much is left (slide numbers).
- Don't rush the presentation.
- Give copies of the slides for reference.
- Minimize your use of "uncovering", fading between slides, and other such ridiculousness.

Choosing a BEAMER theme / color set

- Combinatorics being what it is, there are many options.
- The internet to the rescue:

`http://www.hartwork.org/beamer-theme-matrix/`

BEAMER Problems

- BEAMER is wildly complicated.
  - Sometimes complicated things don't work with each other...
- BEAMER is slow.
- Using BEAMER makes errors very difficult to find.
- A trick: Use the `comment` environment to strike out chunks of your slide set to find the error.

Section 6

Miscellaneous

Outline

Typography

- Like any craft that has existed for thousands of years, the area of typography is vast.
- Options:
  1. Don't change from the defaults and adopt hopefully reasonable defaults.
  2. Try to develop an informed opinion.
- For the second approach, I *love* the book *The Elements of Typographic Style* by Robert Bringhurst.

Typography

- As a first approach, find a book that you consider well made, and mimic its style.
- I love the typesetting in
  - Donald Knuth's *The Art of Computer Programming*.
  - Michael Spivak's *Calculus*.

Your Typeface Choice Conveys Meaning

Your choice of typeface says something about:

- Your material
- Your thoughts about your audience
- You

Choose wisely!

Someone Here is in Kindergarden

I'm not Saying Who, But I Have a Ph.D.

His Supreme Excellency The Right Honorable (Full) Professor Dr. Magnus V. Important, Ph.D., OBE

Department of Mathematics, Transcendent Energy University

Anteater Mathematics Club
March 3, 2013

My Book Report on Egypt
(Absolutely Not a Copy of the Wikipedia Article)

Little Danny Birtwistle
(design by James Cameron)

Sesame Street Elementary School, Room 14B

Anteater Mathematics Club
March 3, 2013

Outline

Keeping up with the Joneses (and Other co-Authors)

- You may regret some change you made, and want to revert to a prior version.
- Your co-authors may not keep you well informed of their changes.
- Editors are surely not going to keep you well informed of their changes.
- You may want to keep track of how your paper changes over time.
- Such problems are solved using some sort of *revision control system*.
- There are many such systems.
- I use SVN. You can make your own choice, but it's better to choose early.

Section 7

Conclusion

Conclusion

- We talked through some basic LaTeX workflow.
- We looked at some common tools and patterns within LaTeX.
- We saw a bunch of useful packages and tools.
- We saw many examples.
- We saw how to make make presentations in LaTeX with BEAMER.
- There were some concluding comments on support tools and typography.

Thank You!

Colophon

- The principal font is Evert Bloemsma's 2004 humanist san-serif font Legato. This font is designed to be exquisitely readable, and is a significant departure from the highly geometric forms that dominate most san-serif fonts. Legato was Evert Bloemsma's final font prior to his untimely death at the age of 46.
- Math symbols from the MathTime Professional II (MTPro2) fonts, a font package released in 2006 by the great mathematical expositor Michael Spivak.
- The URLs are typeset in Luc(as) de Groot's 2005 Consolas, a monospace font with excellent readability.