Chapter 1

My First Chapter

1.1 First section

This is a short sentence. This is an equation shown in the sentence $a^2+b^2=c^2$. A more fancy presentation is

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Definition 1.1.1 tag. This content was created with the **tag** for `definition`. Also in use are the **tags** for `title`, `statement`, `term`, and `c`. ♢

1.2 Aligned content

To align equations, check out the following code,

$$\begin{aligned}(x+1)^2 &= (x+1)(x+1)\\ &= x^2+x+x+1\\ &= x^2+2x+1\end{aligned}$$

Or, perhaps better yet,

$$\begin{aligned}(x+1)^2 &= (x+1)(x+1)\\ &= x^2+x+x+1\\ &= x^2+2x+1\end{aligned}$$

This is the hyperbolic cosecant function, $\operatorname{csch}(x)$.

1.3 Sean's section

1.3.1 Sample subsection

1.4 Sample section

Paragraph heading.

1.4.1 Sample subsection

1.5 Eli's Section

Paragraph heading. This section is dedicated to my work, discoveries, mishaps, and progressions made within PreTeXt. It is broken up into subsections of different types of material. Hopefully it is set up in an easily readable manner.

Back to my github.io.

Note 1.5.1 I'm open to any suggestions on the format of my section/subsections.

1.5.1 Getting Started

Checkpoint 1.5.2 Setting Up. Getting started was one of the easier parts for me using a Linux operating system. Following the guides on PreText, PreTeXt CLI, and PreTeXt Guide were sufficient material and didn't take but an hour to successfully install an have everything up and running.

The only issue for me on Linux is that I had to remove some double quotes and backslashes from the PreTeXt CLI guide when adding python to PATH.

Checkpoint 1.5.3 Next Steps. 1.) After getting started, the next step is to begin undertaking your first book. To begin choose a directory you want your project to be in, then in the terminal type 'pretext new "name_of_your_book"'. Move into the newly created directory (same name as your book) and type 'pretext build' for it to fully create the output files.

2.) Then the fun begins! To create your first section, use the '<section > and </section>' tags. Type the desired contents inbetween these two tags to to write the section. When you create a sectionm, it is also good to add an 'xml:id' to the tag. This is inserted in the '<section >' tag. Ex: `<section xml:id="sec-example">`

3.) Add a title to your section by using the '<title> and </title>' tags udnerneath the section you would like to define. Just place the desired name of the title between the two tags as shown. Ex: `<title> Example Title </title>`

Note 1.5.4 Steps 2 and 3 can be done with most any tag.

1.5.2 General

Checkpoint 1.5.5 Math Notation. Read more about math notaion here.

A short list of `General Tags` and how they are used:

- <m> is for inserting math notation *inline*
- <me> is used for inseting math notation *on it's own line*
- <md> is used for writing out a problem with the *equal signs lined up*
- <mrow> is used inside the <md> tag to distinguish each *row of the equation*

  Note 1.5.6 When you use the <mrow> tag, the equal signs you want lined up must be preceded by \amp, ex: "\amp =".

A short list of `Arithmatic Tags` (these tags must be used inside of `General Tags`):

- \int is how to write *indefinite integrals*
- \int_a^b is how to write *definite integrals*
- \lim_{n\to\infty} is how to write *limits to inifinity* ("n" and "\infinity" can be replaced by any parameters you want to take).
- \sum is how to get the Σ for *sumation notaion*, but for it to work correctly you need to follow it with one of two tags:
  - \limits_{i=1}^n
  - \nolimits_{subscript}

  Note 1.5.7 With \int, \lim_{n\to\infty} or \sum, if you want their sub and superscripts to appear above and below the symbol, you need to precede them with \displaystyle, ex: "\displaystyle\lim_{n\to\infty}" = $\displaystyle\lim_{n\to\infty}$
- Greek letters can be written with "\" followed by the name of the letter, ex: "\Sigma, \sigma" = Σ, σ

Checkpoint 1.5.8 Lists. Read more about lists here.

There are three main types of lists available:

- unordered lists which use the <ul> tag
- ordered lists which use the <ol> tag
- description lists which use the <dl> tag

For each item/row, in any of the above, use the list item tag, <li>, followed by the paragraph tag <p> and place the contents inside.

Checkpoint 1.5.9 Divisions. Read more about subsections and documents divisions here.

The three basic divisions inside of each pretext book are going to be the <chapter>, <section>, and <subsection>. In my experience, when using the <subsection> tag, a <introduction> and a <conclusion> must be included before and after any subsection in order for the compiler not to complain.

Note 1.5.10 If you have any information on how to fix this, I will update this section.

Checkpoint 1.5.11 Images. Read more about images here.

In order to include an image in a document, make a <figure> tag and place a <caption> tag inside of it. If you want to have a description following the figure number, place that desciption inside of the <caption> tag. Next, make a tag <image source="images/name_of_image.png"/> (make sure the image is placed inside the "output/html/images/" directory of the document). If you want to have a description the line above the figure number, place the description in a <description> tag after the <image/> tag.

Example 1.5.12 <figure>
<caption>abc</caption>
<image source="images/name_of_image.png" width="60%"/>
<description>abc</description>
</figure> □

You can also specify the width in percent by placing width="NUMBER%" after the location of the source inside of the <image/> tag as shown in the

above example.

Checkpoint 1.5.13 Imbedded Urls. Read more about imbedded urls here.

Imbedding a url into a piece of text is similar in structure to the <image/> tag. You will use the tag <url href="https://link.com">name of link inline</url>.

The "name of the link inline" between the url tags will show up as blue text and will be underlined when you hover over it with your mouse.

Checkpoint 1.5.14 Tables. Read more about tables here.

Tables can be made by going to LaTeX Table Editor and plugging in your information. You can import your tables from Excel or LaTeX. Change the generate field from "LaTeX" to "PreTeXt" and copy the code that appears.

Note 1.5.15 The website is a little glitchy and gets stuck performing certain funtions.

In order to make them "by-hand", you use the <table> tag (make sure to list an "xml:id" inside of the opening tag) and then create the number of rows inside here with the <row> tag. Then place the number of cells you want in each row with the <cell> tag. `not complete, will finish in the future`

1.5.3 Quirks

Checkpoint 1.5.16 Subsection Issues. One but/feature when using VS-Code is that when you are adding a subsection, it seems to be required to add a introductiona and conclusion to that section. I don't know if it is a problem with other IDE's/editors but it will not compile with out it. Also, the introduction or conclusion cannot both be empty, you need to have something within at least one of them.

Checkpoint 1.5.17 Problems with "\sech" and "\csch". When in math mode, for some reason \sech and \csch do not work and you have to enter them a different way. What worked for me so far is using \mathrm{sech} and \mathrm{csch} to make the text to display correctly.

1.5.4 GitHub.io

Checkpoint 1.5.18 Setup. Unfortunately I cannot (at this time) find the website that I used as a guide to build my GitHub.io site. Here is a somewhat similar *guide* on how to set up the inital site. After you after you do that, create a file named 'index.html'. You can use this as a general template for your index.html:

Example 1.5.19 Index Template. <!DOCTYPE html> <html> <head> <title>Your Name</title> <link rel="stylesheet" type="text/css" href="/css/main.css"> </head> <body> <nav> Home links </nav>   <h1>Greating</h1> Information about you.   <footer> email github </footer> </body> </html> □

Checkpoint 1.5.20 Styling. You can use this as a general template for your main.css:

Example 1.5.21 CSS Template. body { margin: 60px auto; width: 70%; } nav ul, footer ul { font-family:'Helvetica', 'Arial', 'Sans-Serif'; padding: 0px; list-style: none; font-weight: bold; } nav ul li, footer ul li { display: inline; margin-right: 20px; } a { text-decoration: none; color: #999; } a:hover { text-decoration: underline; } h1 { font-size: 3em; font-family:'Helvetica', 'Arial', 'Sans-Serif'; } p { font-size: 1.5em; line-height: 1.4em; color: #333; } footer { border-top: 1px solid #d5d5d5; font-size: .8em; } ul.posts { margin: 20px auto 40px; font-size: 1.5em; } ul.posts li { list-style: none; } □

Checkpoint 1.5.22 Adding Pretext Files. If you want to be able to host a PreTeXt project on your GitHub.io, make a folder in the main folder with the same name as your pretext book. Then place the contents of your 'ouput/html' folder of the project inside of the folder you just created. If you want to create a link to this inside of your website. In the index.html template above, substitue `https://links.links` with the name of your pretext book folder `/my-book/`