Hybrid Book Chapter Template

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Chapter 1

Introduction

1.1 What is it about?

This template is to illustrate how to combine a manually written tex file and that generated from a ipython notebook successfully together without conflicts.

Known Issues:

In raw tex files,

1. If chapters might contain cross references as in this template example, always run main tex once before running any individual chapters
2. includegraphics shall not have any width as, its restricted by default in jupyter's preamble by a hardcoded value of 80%. If you still include, main build will fail.
3. The float and crop options are to be specified in documentclass of main.tex just like they are in sub-files (along with more options like onesided for book type) else main build will fail.
4. As per standalone package rule, the sub-files should refer to main template. So do not create preamble, instead whatever you need, insert in myrawtex.sty, the common style file for raw tex.

In auto generated tex files from ipython notebook,

1. Remove the preamble, instead make it refer the style document created in template myipy2tex.sty

Chapter 2

Raw Tex Sample

This is introduction chapter

2.1 Initial Setup

$$Pr(\theta - 1 \leq x \leq \theta + 1) = 1 \tag{2.1}$$

2.2 CI construction using Pivotal Quantity

In equation 2.1, by adding $-\theta$ to the inequalities, we get the solution ...

2.2.1 testing subsection numbering

OK subsection is numbered

testing subsubsection numbering

NOK `\subsubsection` is not numbered

Chapter 3

Ipython Sample

3.1 Sample

This is just a sample notebook

3.1.1 Sample Sub Section

```
In [1]: print(3+4)
```

```
7
```

Issues:

The `subsubsections` are not numbered. At this time, it looks like problem is at least outside the scope of ipython as even raw tex file shows this problem. Try limiting your sections to 2 levels only. That is till `##` not beyond to be on safe side.

3.1.2 this subsection is numbered

this subsubsection is not numbered

3.1.3 Using Latex Equations

Latex equations cause few issues because Mathjax used by ipython is not fully latex compliant.

Issues:

1. Mathjax is lineant on not using brackets to cover multi digit subscripts while latex is not. `\mu_\widehat{p}` will be converted properly in notebook while gives error in converted tex file. Always wrap subscripts fully. For eg, `\mu_{\widehat{p}}` will work in tex as well.
2. If you use `begin{equation}`, need not embrace further with `$$` which will only create error in converted tex.
3. `begin{equation}` does not allow multi line, so use `begin{aligned}` inside.
4. Double slash for new line will not work unless the set of equations are wrapped within `\begin{align}`

References: 1

Demo:

Set of latex equations which successfully works in converted tex as well.

Raw:

```
$$
\color{blue}{
\begin{aligned}
    \text{Random Variable} \ \ \widehat{p} =  \overline{\widehat{Y}} \\
    \mu_{\widehat{p}} = \mu{\overline{\widehat{Y}}} \\
    \sigma_{\widehat{p}} = \sigma(\overline{\widehat{Y}})
\end{aligned}
}
$$
```

Output:

$$\color{blue}{\begin{aligned} \text{Random Variable} \ \ \widehat{p} = \overline{\widehat{Y}} \\ \mu_{\widehat{p}} = \mu{\overline{\widehat{Y}}} \\ \sigma_{\widehat{p}} = \sigma(\overline{\widehat{Y}}) \end{aligned}}$$

Raw:

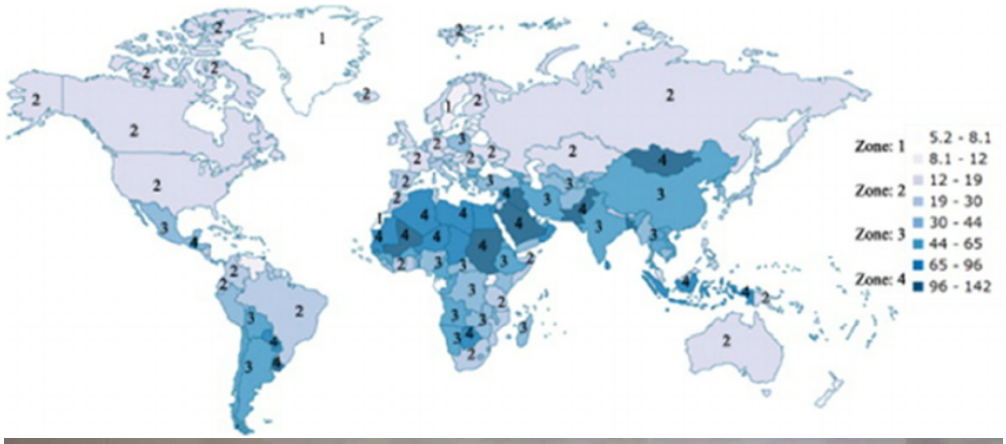
```
$$
\begin{equation}
\color{blue}{
\begin{aligned}
    \text{Random Variable} \ \ \widehat{p} =  \overline{\widehat{Y}} \nonumber \\ \\
    \mu_{\widehat{p}} = \mu{\overline{\widehat{Y}}} \nonumber \\ \\
    \sigma_{\widehat{p}} = \sigma(\overline{\widehat{Y}}) \nonumber
\end{aligned}}
\end{equation}
$$
```

Output (note even if I give nonumber, equation is numbered!):

$$\color{blue}{\begin{aligned} \text{Random Variable} \ \ \widehat{p} = \overline{\widehat{Y}} \\ \\ \mu_{\widehat{p}} = \mu{\overline{\widehat{Y}}} \\ \\ \sigma_{\widehat{p}} = \sigma(\overline{\widehat{Y}}) \end{aligned}} \tag{3.1}$$

3.1.4 Using Attachments

Issue:
Using a `backslash and a space and then a blank line` to avoid attachments becoming floats and placed out of section. This is to be done after every attachment. Else they simply float around. This is a latex issue. Do not worry, they will not appear in latex though they appear here. If nbconvert did not use figure and instead only includegraphis this issue could have been avoided. Got this hint from here

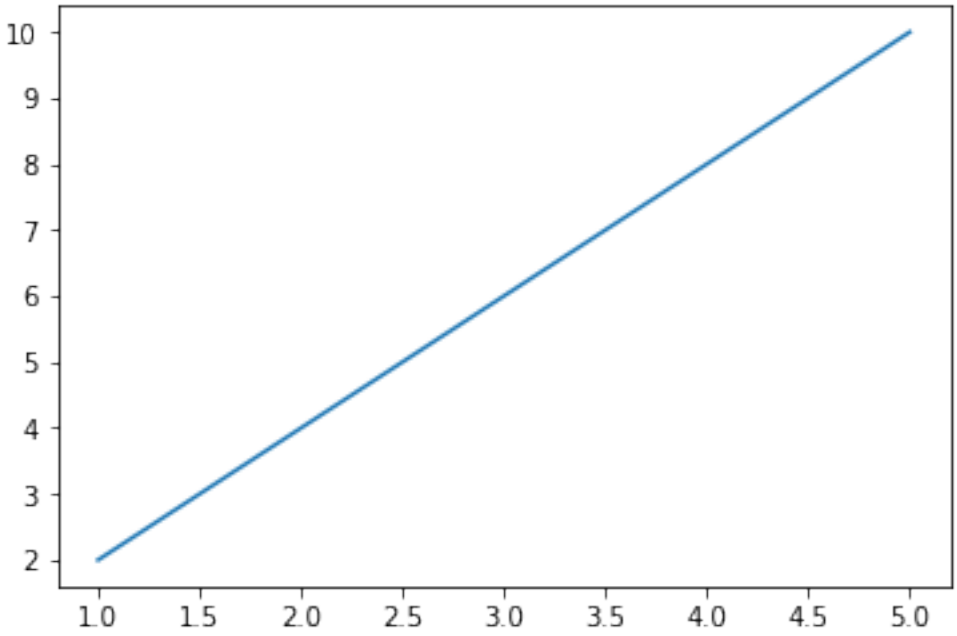


3.1.5 Using Code

This so far seem to have no problems

```
In [3]: %matplotlib inline
        import matplotlib.pyplot as plt

        x = [1,2,3,4,5]
        y = [2,4,6,8,10]
        plt.plot(x,y)
        plt.show()
```



3.1.6 Cross Reference

Sometimes you would want to refer an equation or something in another tex file from here. This is how to do it.

This 2 is a sample cross reference to a section in another raw tex file. This 2.1 is a sample cross reference to an equation in another raw tex file.

Issue: We need to do this in raw cell as cross references are not realized at nbconvert level. Also using this externaldocument would compile the entire main.tex file currently instead of only the referenced file. This should be investigated why. Its a nuisance for now. Also note the line breaks explicitly given instead of double space or latex break because these are raw cells, so a line break also should be literally given as above (would be clear when you view this document in notebook)