LASA

Robotics

Writing Technical and Notebook Documentation in LaTeX

July 6, 2014

LASA Robotics Technical Documentation

What is LaTeX?

LaTeX (pronounced **LAY**-*tek* or **LAH**-*tek*) is a text formatting tool used globally for publication of scientific documents and online articles (including Wikipedia). LaTeX *.tex* documents output as every format from *PDF* to *HTML*.

Why LaTeX?

LaTeX allows for more flexible and consistent typesetting than other processors such as Word or InDesign. Although LaTeX requires users with some experience, most of LaTeX can be done without much difficulty. For LASA Robotics, most of the typesetting work has been done for you. All you have to know are the basics.

Installing LaTeX

If LaTeX is already installed on your machine, skip this step.

Windows

1. Installing MikTeX

Download the latest version of MikTeX from `http://www.miktex.org/download`. Select 'Other Downloads' and find a **Non-basic** installation. When downloading, select a **full installation**, which could take several hours but downloads all necessary packages. When complete, run the wizard again to install downloaded packages. As this take some time, it is recommended to install MikTeX on a flash drive and bring it with you.

2. Installing TeXstudio

Download and install the latest version of TeXstudio **after MikTex is downloaded and installed** from `http://texstudio.sourceforge.net`, which takes several minutes. After this completes, you're good to go!

Linux Debian

Run

```
sudo apt-get install gedit-latex-plugin texlive-fonts-recommended latex-beamer
texpower texlive-pictures texlive-latex-extra texpower-examples imagemagick
```

to install the GUI and all packages for LaTeX. Other distributions, including Redhat, may need alternate configurations (note that Debian-based Linux operating systems such as Ubuntu are included in this documentation.)

Mac

Good luck!

Types of Documentation

There are two types of documentation written in LASA Robotics: **Technical** and **Notebook**. Although similar, there are different templates for each and both are included in the final notebook.

Technical documentation is written for **someone on the team to read**. For example, a coder would write a document describing how a piece of code works and how to use it or explain to the drivers how to set up the autonomous program *in technical documentation* (this is an example of a technical doc).

Notebook documentation is written to **describe a process for a judge to read**. For example, daily logs, email records, and goofy team photos would fit in *notebook documentation*.

Follows is the tutorial for setting up either technical or notebook documentation. If you have already completed this, scroll down and copy and paste the technical/notebook documentation examples at the bottom.

Technical Documentation

The first step of any documentation is to create a .tex file. Create one using your document and save it somewhere safe.
Then, we begin writing. Import the technical library like so on the first line of your .tex document:

```
\input{../library_technical}
```

The location of the file may be different, but make sure you have `library_technical.tex` as input file.

Notebook Documentation

As with technical documentation, the first step of any is to create a .tex file and save it somewhere safe.
Then, we import the notebook library like so on the first line of your .tex document:

```
\input{../library_notebook}
```

The location of the file may be different, but make sure you have `library_notebook.tex` as input file.

Setting Up the Document

Setting up a LaTeX document is easy. Add the following line of code so your document looks like this:

```
\input{../library_******}
\begin{document}

\end{document}
```

Notice that all LaTeX commands start with a `\`.

In the `\begin{document} ... \end{document}` section, add the following.

```
%PART AND CHAPTER DETAILS - REPLACE HIGHLIGHTED!!!
\renewcommand{\currentpart}{LASA Robotics Technical Documentation}
\renewcommand{\currentchapter}{Topic, ex.Writing Documentation in LaTeX}
\createtitle{relative path to library folder}
```

You should be done with initialization now. For future reference, examples are below.

Examples

To create a new document, copy then **template.tex** from the same directory as the libraries. Below are a few basic example files, but you should use **template.tex** as your template.

Technical Documentation

```
\def \librarypath {../}  %relative path to library
\input{\librarypath library_technical}

\begin{document}
\renewcommand{\currentpart}{LASA Robotics Technical Documentation}
\renewcommand{\currentchapter}{Topic}
\createtitle{\librarypath}  %relative path to library

%-----INSERT CONTENT HERE-----%

\end{document}
```

Notebook Documentation

```
\def \librarypath {../}  %relative path to library
\input{\librarypath library_notebook}

\begin{document}
\renewcommand{\currentpart}{LASA Robotics Notebook Documentation}
\renewcommand{\currentchapter}{Topic}
\createtitle{\librarypath}  %relative path to library

%-----INSERT CONTENT HERE-----%

\end{document}
```

Syntax Guide

Basic Symbols

`\command` : Indicates a command

`\\` : Indicates a new line

`\\\\` : Indicates a new paragraph

`\sla` : The `\` symbol

`%` : Indicates a comment not read by LaTeX

`%%` : The `%` symbol

`$ ... $` : Inline math mode (ex: I^2C)

Document Structure

There are five primary document structures LaTeX uses in its formatting, from greatest to smallest.

`\section{title}` : Creates a new section

`\subsection{title}` : Creates a new subsection

`\subsubsection{title}` : Creates a new subsubsection

`\paragraph{title}` : Creates a new paragraph

`\subparagraph{title}` : Creates a new subparagraph

Font Manipulation

Surround text and command like this: `{\emph Hello world!}` to only affect small portions of text.

`\emph` : *Emphasis*

`\textbf` : **Boldface**

`\underline` : <u>Underline</u>

`\texttt` : `Typewriter`

`\code` : `Codebox`

`\url` : URL - `http://lasarobotics.org`

`\left` : Left-aligned

`\right` : Right-aligned

`\indent` : Indent text like a paragraph

`\tiny` : Tiny text

`\small` : Small text

`\normalsize` : Normal text

`\large`, `\Large`, `\LARGE`, `\HUGE` : Even bigger fonts

Environments

Environments run LaTeX's powerful processing. With these, you can create anything from centered text to lists. Remember that wherever there is a `\begin`, there must be an `\end`.

Alignment

`\begin{center}` : Centers large amounts of text

`\begin{flushright}` : Right aligns large amounts of text

`\begin{flushleft}` : Left aligns large amounts of text

Bulleted Lists

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

Enumerated Lists

```
\begin{enumerate}
\item Hello
\end{enumerate}
```

Paragraph Codeboxes

Paragraph codeboxes may need padding (`\\\\`) to appear correctly on the page. They allow for newlines (`\\`) unlike inline `\code` boxes.

```
\codefull{Text}
```

Graphics

LaTeX can automagically include JPG, PNG, and EPS (vector) graphics.

Not Wrapped

These graphics will be placed directly into the document, without word wrap.

```
\image{relative location}
```

If you wish, you can even set the width of the graphic like this:

```
\image[width (in or px)]{relative location}
\image[1in]{./myimage}
```

Wrapped and Right Aligned

Wrapped images will automatically right align to the page.

```
\imagewrap{relative location}{width}{Text}
\imagewrap{./myimage}{2in}{Lorem ipsum, lorem ipsum...}
```

That's all folks!

Once you give the basic syntax a try, you are ready to write new docs! Congratulations and enjoy writing beautiful documents!