Resources: LaTeX

George McNinch

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LaTeX

This term, your solutions to each homework assignment (and report) should be submitted to gradescope as a PDF file.

Since your solutions will need to contain mathematical symbols etc., I'd like you to learn to typeset your homework solutions using LaTeX – see https://en.wikipedia.org/wiki/LaTeX. (It is anyhow likely to be useful to you to know some LaTeX…!)

Overleaf

One way to produce LaTeX without having to install a bunch of software on your computer is to use the online tool Overleaf.

And overleaf has a handy tutorial which you are encouraged to peruse.

This tutorial has some good answers to the question "why learn LaTeX?", including:

> LaTeX is used all over the world for scientific documents, books, as well as many other forms of publishing. Not only can it create beautifully typeset documents, but it allows users to very quickly tackle the more complicated parts of typesetting, such as inputting mathematics, creating tables of contents, referencing and creating bibliographies, and having a consistent layout across all sections.

and the tutorial points out the following very important fact:

> One of the most important reasons people use LaTeX is that it separates the content of the document from the style.

So you edit a plain text file whose name is usually of the form `*.tex`, and then LaTeX is used to transform this file ultimately into a PDF. When you use overleaf, you edit the `*.tex` file in the overleaf editor, and you (more-or-less) immediately see the output of the transformation performed by LaTeX. And once you are happy with the appearance and content, you can save the resulting PDF file to your computer (and then submit it to gradescope in the case of a homework assignment).

Template

Here is a link for a very basic template for homework assignments that you can start with. I've also include the contents of this template in this post – see below.

This template makes some stylistic choices that you are of course welcome to change! You may begin experimenting with this as follows. First, create a project in overleaf. Next, delete the template that is provided for the new project, and paste this into the editor. Now, when you click "recompile", overleaf should render the output.

Here is the PDF obtained from compiling this latex document.

```
\documentclass{article}

\usepackage{graphicx, color}
\usepackage{palatino, mathpazo}
\usepackage{enumerate, mathtools}
\usepackage{hyperref}
\usepackage[margin=2cm]{geometry}
\usepackage{minted}
\usemintedstyle{tango}
\usepackage[svgnames]{xcolor}
%
% Edit me!!
%
\newcommand{\myname}{MyName}
\newcommand{\assignment}{Homework \(n\)}
%
%
\newcounter{problem}
\newenvironment{problem}{
\refstepcounter{problem}
\noindent
{\color{NavyBlue}\textbf{Problem \theproblem.}}

\noindent
\hspace{.02\textwidth}
\begin{minipage}[t]{.98\textwidth}}
{\end{minipage}
\vspace{5mm}}


%% -------------------------------------------------------
%% topline is a bit like a function of 3 "variables",
%% referred to as #1, #2, and #3
%% -------------------------------------------------------
\newcommand{\topline}[3]{
\noindent
{
\color{NavyBlue}
\begin{minipage}[t]{.35\textwidth}
#1
\end{minipage}
\begin{minipage}[t]{.35\textwidth}
#2
\end{minipage}
\begin{minipage}[t]{.30\textwidth}
#3
\end{minipage}
\hrule
}
}

%% -------------------------------------------------------
%% end of topmatter
%%-------------------------------------------------------

\begin{document}
```

```
\topline{Math 087 - Spring 2024}{Assignment 0}{\myname}

\vspace{2cm}

\begin{problem}
Here is the first homework problem solution.
\[\int_{-\infty}^\infty e^{-x^2}dx = \sqrt{\pi}.\]
\end{problem}

\begin{problem}
Here is the second homework problem solution.
It has some parts:
\begin{enumerate}[(a)]
\item One aspect of this problem.

  Some further discussion.

  Still more...
\item Another aspect
\end{enumerate}
And it has a
\href{http://www.tufts.edu}{URL reference (Tufts)}.
%% -----------------------------------------------------
%% the command \href and the behavior of
%% \begin{enumerate}[(a)] ...
%% depend on some of the packages we loaded in the
%% topmatter.
%% -----------------------------------------------------
\end{problem}

\begin{problem}
  Here we include some computer code.

  \begin{minted}[bgcolor=Lavender]{Python}
    def square(x):
    return x*x

    result1=list(map(square,[1,2,3]))
    result2=list(map(square,[2,4,6]))
    print(result1)
    print(result2)
  \end{minted}

  and we include also the \emph{output} from this code's execution:
  \begin{verbatim}
  [1, 4, 9]
  [2, 16, 36]
  \end{verbatim}

\end{problem}
\end{document}
```
