Gentle Homework One

M.M. Dalkilic

August 21, 2017

Introduction

This is your first homework. It is meant to help you set-up your `R` environment, get used to using LaTeX, and starting thinking about managing your time. Using a file extension to identify a file is a bit clumsy, since the extension is nothing more than a few letters. In this homework, "*pdf" means a file whose extension is ".pdf" and "*tex" means a file whose extension is ".tex". In a few of these problems, you won't actually produce anything–you'll simply be reading.

DUE Tusday, August 29 5:00P EST

INPUTS

1. `homework one.pdf`
Directions for homework.

2. `homework1.tex`
A template that you will use for the semester to turn-in solutions. This allows you to produce nice listing of R scripts.

3. `homework1.pdf`
This is what LaTeX produces.

4. `s1.R`
An R script that plots points on a line.

5. `plot1.png`
A *png file of the plot from the R script.

OUTPUTS

1. `homework1a.tex`
The *tex of your new homework.

2. `homework1a.pdf`
The *pdf of the *tex file.

3. `s2.R`
An R script that plots and prints a new function.

4. `plot2.png`
A *png file of the plot from the new R script.

Homework Problems

1. Read the syllabus carefully.

2. Download and install LaTeX, `R`, and acquire the textbook (there is a Kindle version) and read chapter one.

3. Download and peruse the HW1 folder under Canvas Files. You will see four files.

   - `homework1.pdf`. This is the *pdf of the *tex file
   - `homework1.tex` that is the source file
   - `plot1.png` an image created in R
   - `s1.R` the actual R script that created the image

4. Move the *pdf to another folder. Compile `homework1.tex`. It will produce a *pdf identical to the one that you've moved.

5. For the next task, you'll need to inspect the *tex file directly. Inside `homework1.tex` find the portion of code that reads:

```
\begin{homeworkProblem}
Listing \ref{s1} shows R script that graphs a function
$f(x) = 2x - 30$ at points $x=1,3,5,\ldots,50$.
The graph is saved to \texttt{plot.png}.

\rscript{s1}{Sample R Script With Highlighting}
```

   You'll see that we've created a macro that takes R script (text appended with .R) that lists the script in a nice way.

6. Find the portion of code that reads:

```
\begin{homeworkProblem}
This is the graph from Problem 1.
```

```
\problemAnswer{
\begin{center}
\includegraphics[width=0.75\columnwidth]{plot1.png} % Example image
\end{center}
}
\end{homeworkProblem}
```

The plot `plot1.png` that was created with `R` is displayed.

For sake of ease, we've placing both the script (`s1.R`) and image `plot1.png` in the same directory – as you learn LaTeX, you'll likely want to separate these.

7. Create an R script called `s2.R` that plots:

$$f(x) \quad = \quad (1 + \frac{1}{x})^x$$

for $x = 1, 6, 11, \ldots, 200$.

The image should be named `plot2.png`.

8. Create a new *tex that uses your new function and plot above and call it `homework1a.tex`. Fill-in your name, due date, *etc.*. Compile and produce a *pdf.