Best Practices for the Political Scientist

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A Quick Overview...

1. Write using plain text

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3. Use a version control system

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- 20 years later, some grad student wants to extend our work
- How did we make Figure 1?
- Non-plain text files may be unusable 20 years from now
- Word processors (like MS Word) are stupid and inefficient

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- These source files (for example, .R for R scripts or .do for Stat do-files) should be liberally commented
- Comments explain what you are doing to your future self, collaborators, and others

Comment example

```
# This code creates Fig 1
# I use the mtcars dataset (included with R)
library(ggplot2)
ggplot(mtcars, aes(mpg, wt)) +
  geom_point() +
  geom_smooth(method="lm") # Adds OLS line with SEs
ggsave("fig/fig1.pdf")
```

- Save this code snippit as `fig1.R` (or similar)

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- Previous example - have two files for one plot in a paper
  - The paper itself (document.tex or similar)
  - the script to create the figure (fig1.R or similar)
- What if we could combine these to have everything in one easy-to-read file?
  - This is what literate programming is all about!

Literate programming example (using knitr)

```
\begin{section}
This is an example paragraph, writte in \LaTeX.
Using knitr, we can include R code in the following manner
I can reference the figure number by calling ref:
Figure \ref{fig:mpg-and-weight}.
% NTS - updating that figure with squared x doesn't change
\begin{figure}
\centering
<<fig1plot>>=  # Starts R code, labels it `fig1plot`
# I use the mtcars dataset (included with R)
library(ggplot2)
ggplot(mtcars, aes(mpg, wt)) +
  geom_point() +
  geom_smooth(method="lm") # Adds OLS line with SEs
@ % closes R code
\caption{Miles per gallon and weight}
\label{fig:mpg-and-weight}
\end{figure}
```

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- Word's "track changes" feature...

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  - ((show example paper))

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- ((show example git history))

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  - I included the PDFs, which is unusual since they aren't plain text

Bonus best practice - Test your code!

- If you write your own function, it is important to test it to make sure it does what you want it to do!

```
my_mean <- function(dat){
  the_sum <- numeric()
  N <- length(dat)
  for (i in 1:N){
    if(i==1){the_sum <- dat[1]}
    else{
    the_sum <- the_sum * dat[i]
  }}
  my_mean <- the_sum / N
  my_mean
}
mean_of_zero <- c(-2, -1, 1, 2)
my_mean(mean_of_zero)
```

```
## [1] 1
```

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  - Google "Sweave for Stata" or "reproducable research and Stata"

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