Using R

UWM Political Science Graduate Lecture Series

Nicholas R. Davis

UW-Milwaukee

11/15/2019

Everyone has a preference. . .

What Makes R Different

R is a *statistical computing environment*.

- free, open-source implementation (and extension) of the S language
  - John Fox's R installation guide: R-install-instructions.html
- makes routine data analysis easy and also supports convenient programming
- user contributions have added markdown, LaTeX integration and powerful graphics

How To Use R

You can run R using the supplied GUI or run from a terminal

- there are annoyances (crappy automatching, completion)
- R CMDR, particularly good as teaching tool for undergrads

Alternatives

- text editors such as SublimeText, Atom, VScode
- IDE, most popular is RStudio
- plus of these is Git/version control

Advantages of Using RStudio IDE

RStudio represents a collective effort; has shaped R use experience perhaps more than any other development.

- at least 20 active developers: RStudio GitHub page
- key features include task-specific panes (i.e. workspace browser - very cool!)
- r markdown and git integration
- IDE can be used as an editor for R, markdown, LaTeX, plain text, etc.

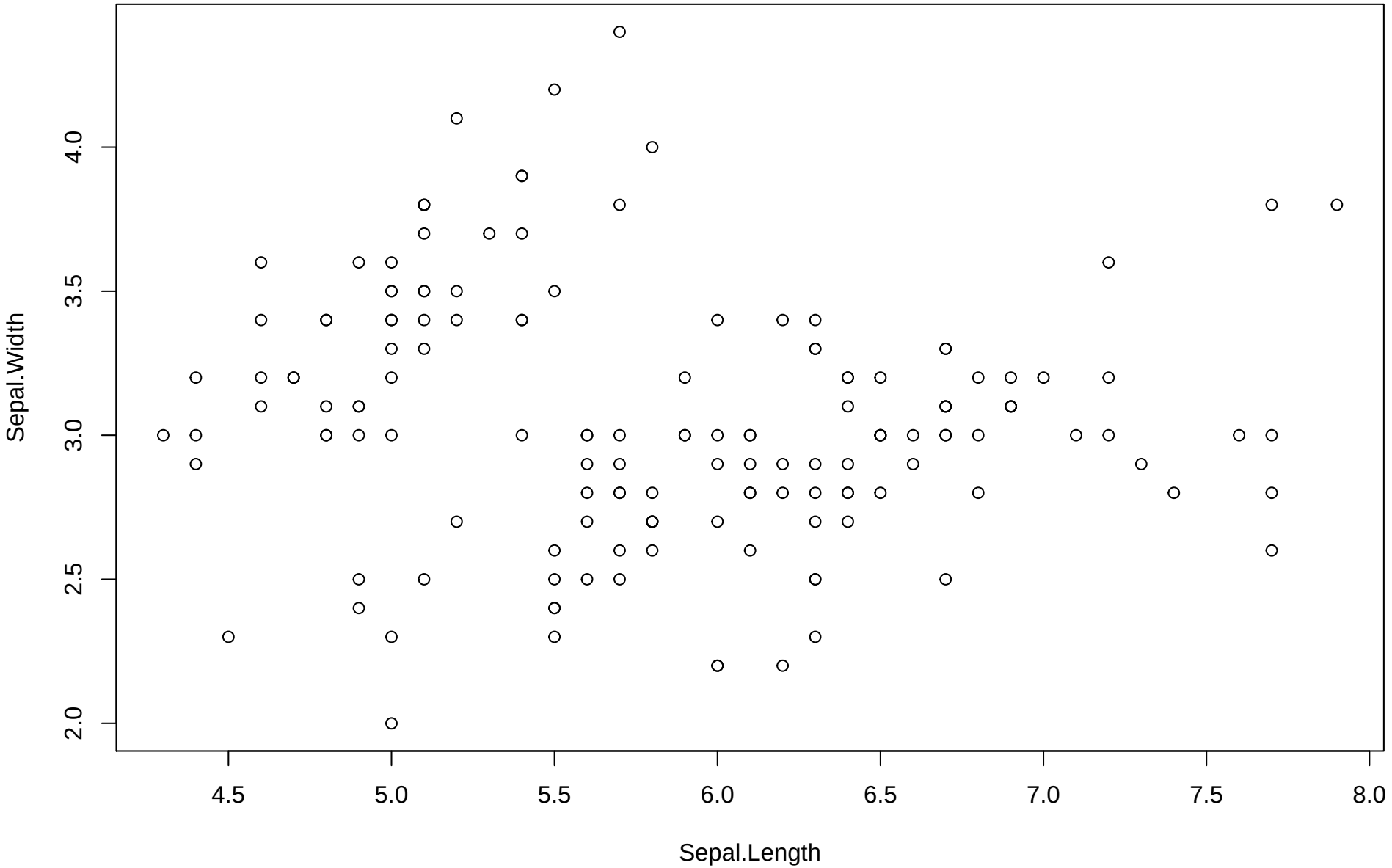
Pick up a new hobby: Knitting

Code Example

```
data(iris)
summary(iris[, 1:3])
```

```
##    Sepal.Length    Sepal.Width     Petal.Length
##  Min.   :4.300   Min.   :2.000   Min.   :1.000
##  1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600
##  Median :5.800   Median :3.000   Median :4.350
##  Mean   :5.843   Mean   :3.057   Mean   :3.758
##  3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100
##  Max.   :7.900   Max.   :4.400   Max.   :6.900
```

Figure Example



Tips and Tricks for UX

Creating a good user experience is key to productivity (even for occasional users).

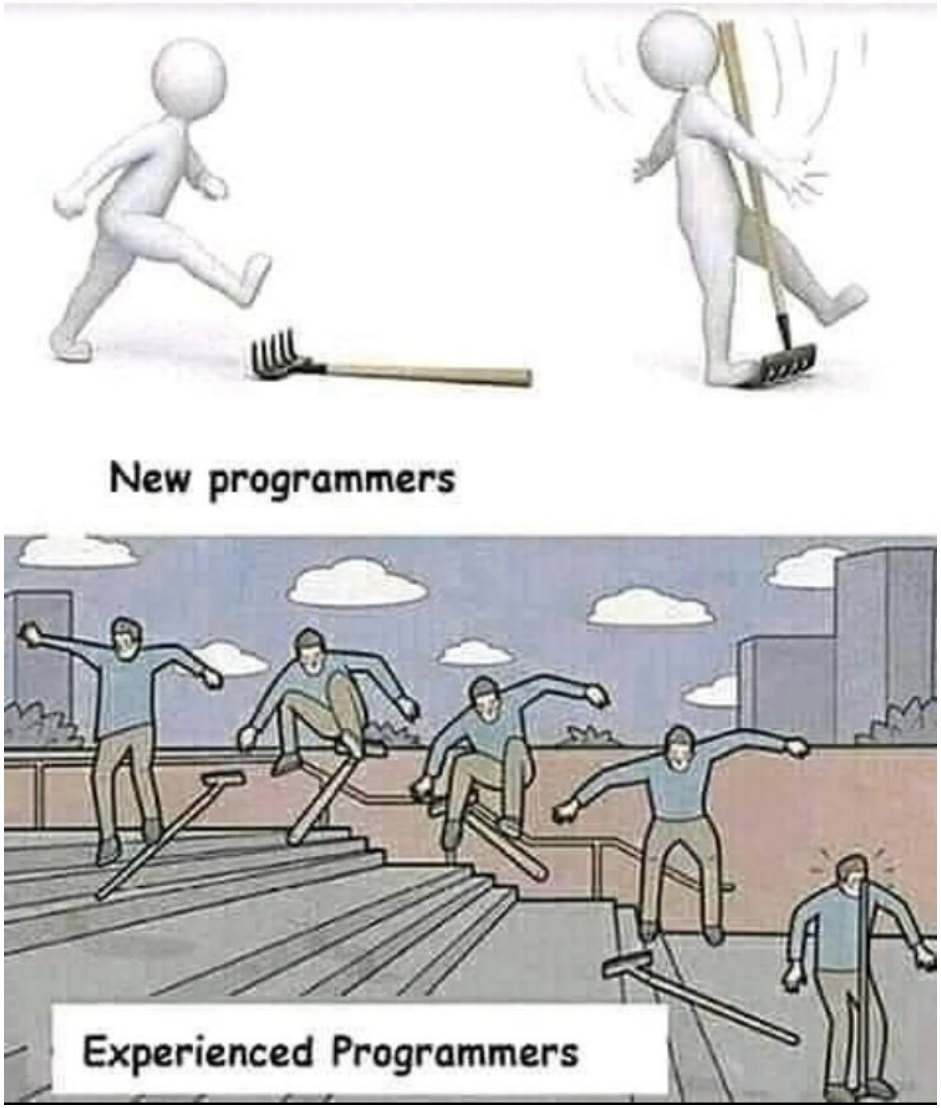
- SOFT WRAP (not a sandwich, but almost as good)
- commenting with hotkey (and other hotkeys)
- IDE pane layout, theme
- user/machine-specific: how to create a `.rprofile` and what to avoid
- updating packages/upgrading to new R distribution

Working with data

Base R is actually a really great data editing environment; RStudio has made this even better.

- data types
- variables
- loading; use `car::Import` for most types
- merging data (some words of caution)

Programming in R



Functions

As a statistical computing environment, R allows for custom functions (and editing existing functions).

- why should you write your own function?
- general practices (i.e. masking)
- loops and conditionals
- apply, aggregate
- example: lag(x)

Getting help

Since R is open-source and user contributed, there is no "help desk" as with Stata, others; don't despair, the R community can be very helpful.

- help yourself: documentation and manuals
- a little light reading: textbooks, online books, guides
- anarchy in motion: r stack on stack overflow
- when in doubt, tweet: search for `#rstats`