

R Notebooks

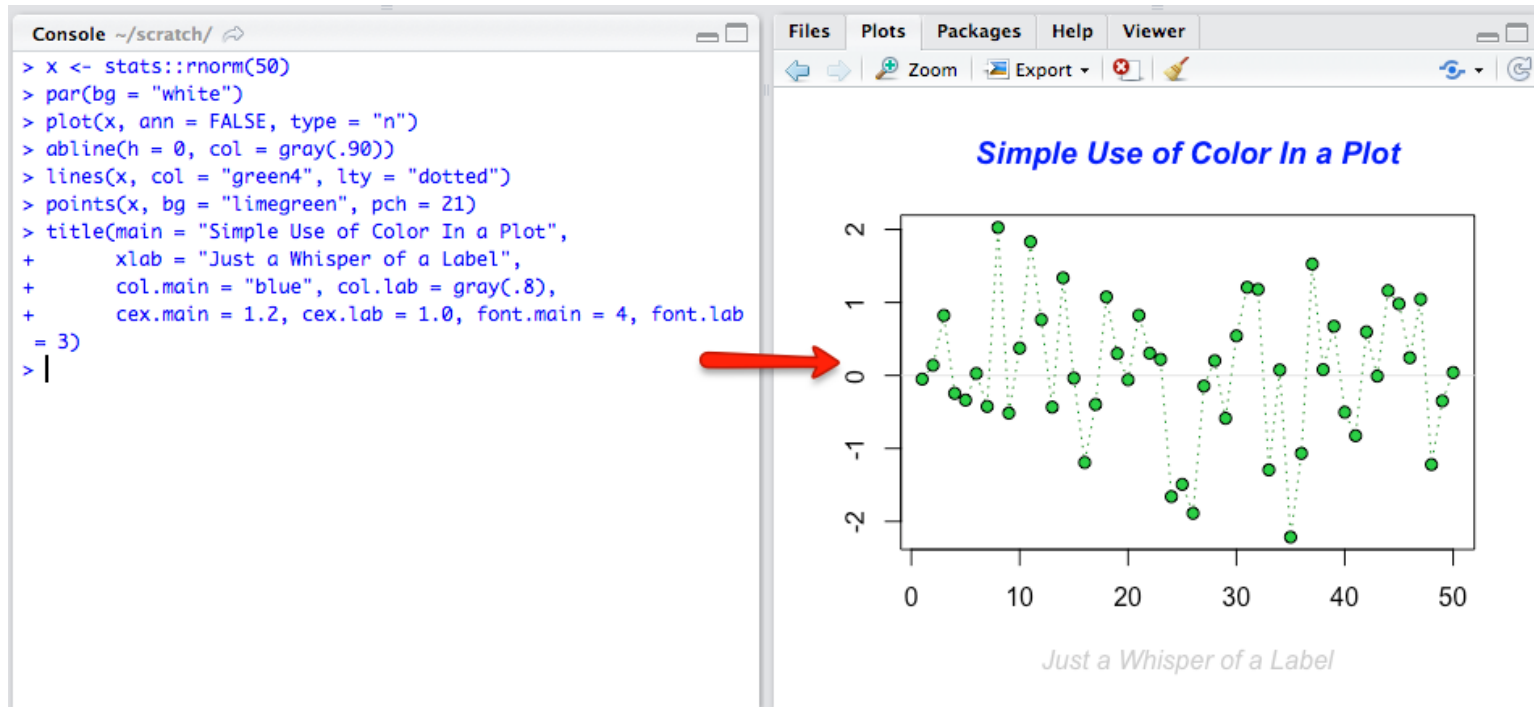
Jonathan McPherson

July 27, 2016

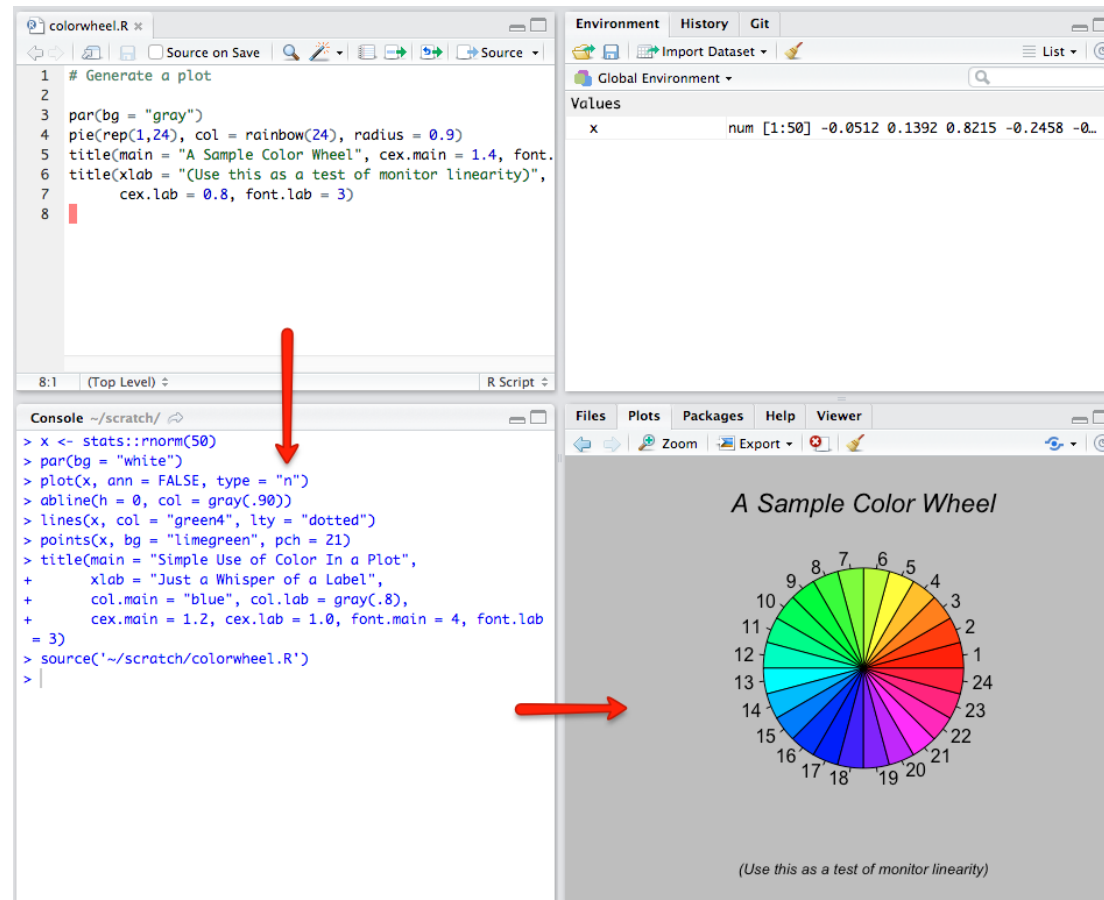
Outline

1. Background: Data Analysis Workflow
2. R Notebooks
3. Demo
4. Q&A

Level 1: Typical new R analyst



Level 2: Experienced R analyst




Level 3: Literate R analyst

graphics.html Open in Browser Find Publish

Pie Sales

We have already confessed to having these. This is just showing off X11 color names (and the example (from the postscript manual) is pretty "cute".

```
pie.sales <- c(0.12, 0.3, 0.26, 0.16, 0.04, 0.12)
names(pie.sales) <- c("Blueberry", "Cherry",
  "Apple", "Boston Cream", "Other", "Vanilla Cream")
pie(pie.sales,
  col =
c("purple", "violetred1", "green3", "cornsilk", "cyan", "white"))
title(main = "January Pie Sales", cex.main = 1.8, font.main = 1)
title(xlab = "(Don't try this at home kids)", cex.lab = 0.8, font.lab = 3)
```



January Pie Sales

Cherry
Blueberry
Apple
Vanilla Cream
Other
Boston Cream

(Don't try this at home kids)

Boxplots

I couldn't resist the capability for filling the "box". The use of color seems like a useful addition, it focuses attention on the central bulk of the data.

```
57 I couldn't resist the capability for filling the "box". The use
58 of color seems like a useful addition, it focuses attention on
59 the central bulk of the data.
60
61 par(bg="cornsilk")
62 n <- 10
63 g <- gl(n, 100, n*100)
64 x <- rnorm(n*100) + sqrt(as.numeric(g))
65 boxplot(split(x,g), col="lavender", notch=TRUE)
66 title(main="Notched Boxplots", xlab="Group", font.main=4,
67 font.lab=1)
68
69 ## Filling Between Curves
```

25:45 Chunk 2 R Markdown

```
> lines(x, col = "green4", lty = "dotted")
> points(x, bg = "limegreen", pch = 21)
> title(main = "Simple Use of Color In a Plot",
+ xlab = "Just a Whisper of a Label",
+ col.main = "blue", col.lab = gray(.8),
+ cex.main = 1.2, cex.lab = 1.0, font.main = 4, font.lab = 3)
> source("~/scratch/colorwheel.R")
> pie.sales <- c(0.12, 0.3, 0.26, 0.16, 0.04, 0.12)
> names(pie.sales) <- c("Blueberry", "Cherry",
+ "Apple", "Boston Cream", "Other", "Vanilla Cream")
> pie(pie.sales,
+ col = c("purple", "violetred1", "green3", "cornsilk", "cyan", "white"))
> title(main = "January Pie Sales", cex.main = 1.8, font.main = 1)
> title(xlab = "(Don't try this at home kids)", cex.lab = 0.8, font.lab = 3)
> par(bg="cornsilk")
> n <- 10
> g <- gl(n, 100, n*100)
> x <- rnorm(n*100) + sqrt(as.numeric(g))
> boxplot(split(x,g), col="lavender", notch=TRUE)
> title(main="Notched Boxplots", xlab="Group", font.main=4, font.lab=1)
> |
```

Environment History Git

Global Environment

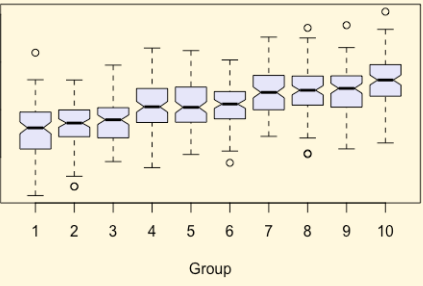
Values

Variable	Value
g	Factor w/ 10 levels "1","2","3","4",...: 1 1 1 1 1 1...
n	10
pie.sales	Named num [1:6] 0.12 0.3 0.26 0.16 0.04 0.12
x	num [1:1000] 1.6 2.17 1.75 1.24 3.26 ...

Files Plots Packages Help Viewer

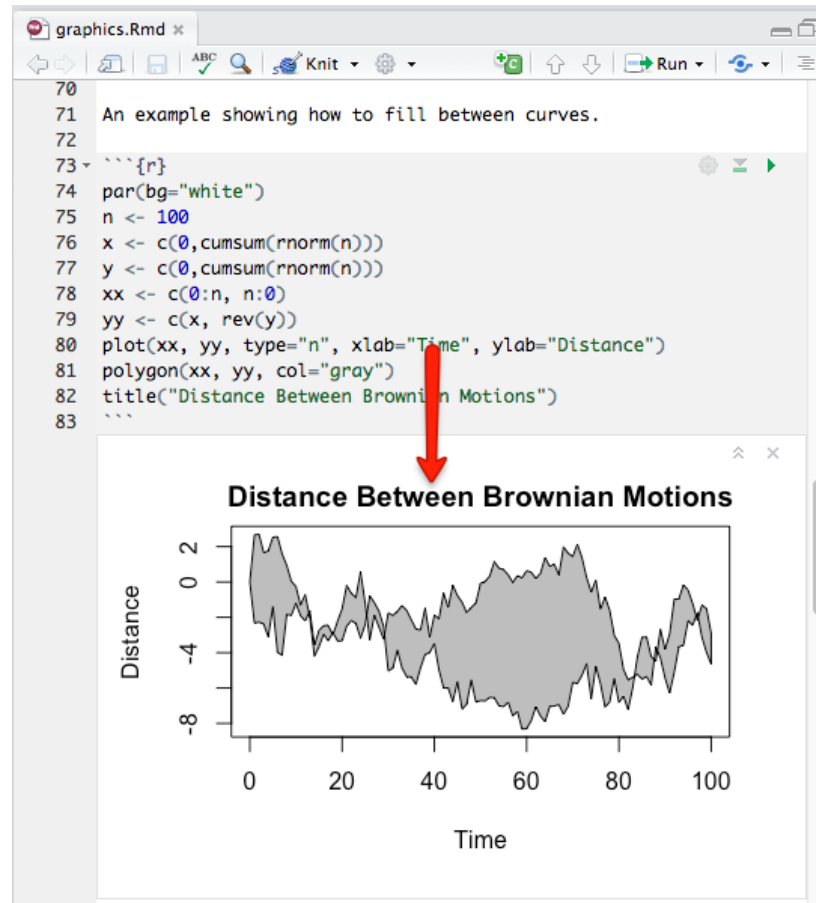
Zoom Export

Notched Boxplots



Group

Level 4: Introducing R Notebooks



R Notebooks Summary

1. Interact with R in a **single, seamless stream**.
2. **Iterate quickly** on code and output; see code and output together.
3. Leave a **clean, reproducible record** of your analysis in a simple text file.
4. Document your analysis with **rich, literate prose**.
5. **Share and publish** easily.
6. **One-click export** to PDF, Word, etc.

Demo

Compared with Jupyter

- Different interaction model (cells vs. text)
- First-class support for R, some support for other "kernels"
- Plain text format is more amenable to version control
- No special viewer required
- Cross-render to final output

Advanced topics

- Execution queue control
- Notebooks in RStudio Server
- Version control
- Rendering & hooks from other R front ends

R Notebooks Summary

1. Interact with R in a **single, seamless stream**.
2. **Iterate quickly** on code and output; see code and output together.
3. Leave a **clean, reproducible record** of your analysis in a simple text file.
4. Document your analysis with **rich, literate prose**.
5. **Share and publish** easily.
6. **One-click export** to PDF, Word, etc.

Links

- RStudio Preview:
<https://www.rstudio.com/products/rstudio/download/preview/>
- R Notebooks: http://rmarkdown.rstudio.com/r_notebooks.html

Q&A