Lesson 12. Creating Polished R Markdown Documents

Assoc. Prof. D. Phillips and N. Uhan

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Download the R Markdown file for this document here:

> https://github.com/sa421-usna/lesson-12/zipball/master

```r
# Required packages
library(knitr)
library(ggplot2)
```

Overview

- Setting up RStudio with the ability to "Knit to PDF."

- A few tips and tricks to polish your R Markdown documents.

- We are showing the code chunks in this document for educational purposes. You should hide your code in your reports.

Setup - installing MiKTeX

- MiKTeX is a distribution of LaTeX (prounounced "lay-tek" or "lah-tek") for Windows.

- LaTeX is a typesetting system commonly used by mathematicians, engineers, physicists, and others.

- When you press "Knit to PDF" in RStudio, it converts your R Markdown document into LaTeX.

- Download MiKTeX from here: https://miktex.org/download

- Run the installer, and restart your computer.

- Open an R Markdown file in RStudio, and try knitting to PDF. You may be prompted to install some packages.

Separate your chunks

- Make sure your R chunks are separated by at least 1 blank line. Otherwise, strange behavior can occur when knitting to PDF.

```r
# Print a message
print("Here's one chunk.")
```
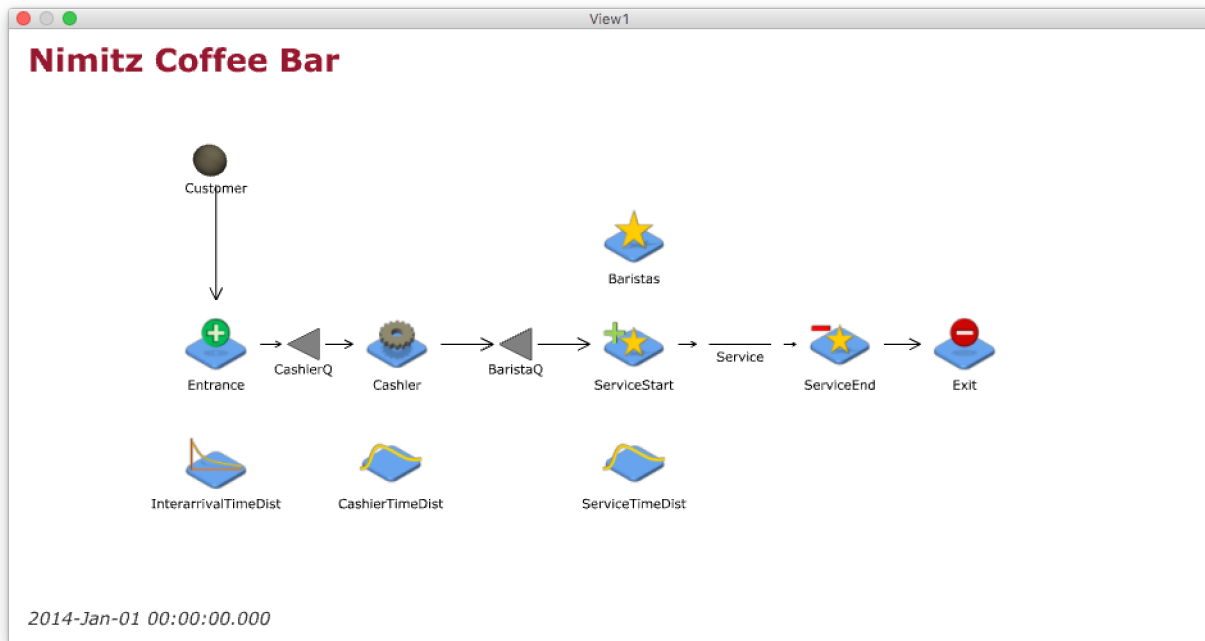
```
## [1] "Here's one chunk."
```

```r
# Print another messsage
print("Here's another chunk.")
```

```
## [1] "Here's another chunk."
```

Images

- Including an image works almost the same way as before. The R Markdown code below includes the following image right below this text.

- Note the extra \ (backslash + space) at the end of the line. This prevents a caption from appearing.
- If you want to resize your images or include a caption, try the method below instead.

```
# Take a look at the options for this chunk in the Rmd file
# Here is the image
include_graphics("jaamsim-screenshot.png")
```
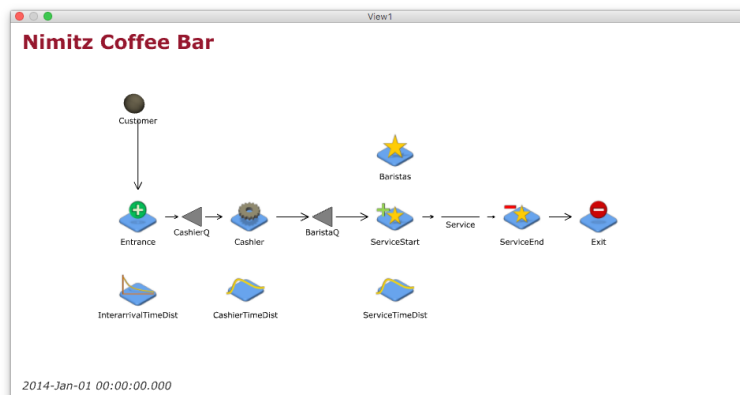

Figure 1: Simulation flow chart

- `fig.pos='h'` prevents the image from floating away to somewhere else on the page, or even to another page.
- These chunk options (`out.width`, `fig.cap`, `fig.pos`, `fig.align`) work with plots as well. Here's another example.

```r
# Take a look at the options for this chunk in the Rmd file
# Here is a simple plot
ggplot() +
  geom_point(aes(x = 1:10, y = 1:10)) +
  labs(x = 'x-axis', y = 'y-axis', title = 'Title')
```
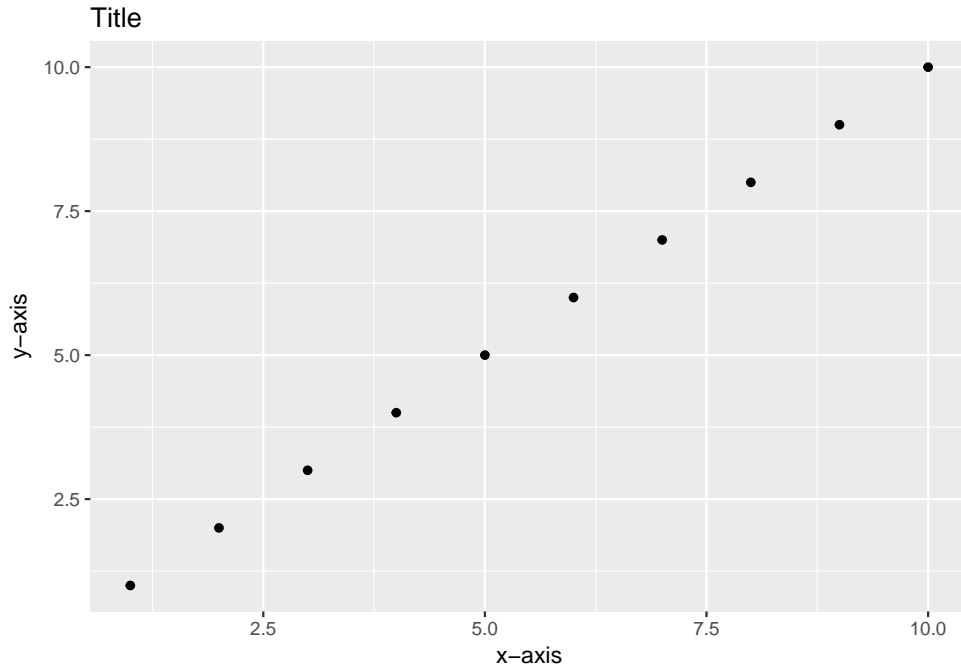

Page breaks

- Control the page breaks in your document with \newpage.

Tables

- You can also include a caption with a Markdown table. Here is an example.

Table 1: Goodness-of-fit statistics and criteria for cashier time data.

	Exponential	Gamma
Kolmogorov-Smirnov statistic	123	456
AIC	789	012
BIC	345	678

- You can also do the same for a `kable` table based on a data frame. Here's an example of how to do this.

```r
# Read in summary data
summary <- read.csv('summary.csv')
```

```
## Warning in read.table(file = file, header = header, sep = sep, quote =
## quote, : incomplete final line found by readTableHeader on 'summary.csv'
```

```r
# Print summary data into a nice table
# Provide proper column names
# Provide a caption
kable(summary, col.names = c('Number of levels',
                             'Average fraction of spots occupied',
                             'Average time to find a parking spot'),
      caption = 'Predicted values from simulation experiment.')
```

Table 2: Predicted values from simulation experiment.

Number of levels	Average fraction of spots occupied	Average time to find a parking spot
3	0.903	3.223
4	0.851	1.283
5	0.755	0.005
6	0.629	0.000

What else?

- There are many other things you can do to make your R Markdown documents look nice and professional.

- Google is your friend, but be aware that sometimes the top results don't give the best or easiest way to accomplish something.

- Chunk options: `https://yihui.name/knitr/options/`

- Options for knitting to PDF: `http://rmarkdown.rstudio.com/pdf_document_format.html`