RMarkdown Template for Managing  
Academic Affiliations

Also Deals with Cross References and  
Reference Abbreviations for MS-Word Output

**Introduction**: There’s a big scientific problem out there. I know how to fix it. **Methods**: My experiments are pure genius. **Results**: Now you have your proof. **Conclusion**: Give me more grant money.

##### This is my abstract. I will talk about my abstract here. You can refer to calculations in your text. For example, the cosine of radians is. In fact, you can refer to any R object (e.g., the mean and standard deviation of a variable.).

/\* This is css, which formats the html using whatever styles you wish.\*/  
  
@import "http://fonts.googleapis.com/css?family=Anonymous+Pro:400,400italic,700,700italic&subset=latin,latin-ext";  
@import url(http://fonts.googleapis.com/css?family=Inconsolata:400,700);  
@import url(http://fonts.googleapis.com/css?family=Source+Code+Pro:400,700);  
  
  
body {  
 margin:0 auto;  
 font-family: "Times New Roman", Times, serif;  
 font-size:1em;  
 text-align:left;  
 max-width:6.5in;  
 line-height: 1.25em;  
}  
  
table {  
 border-collapse: collapse;  
 border-bottom:1px solid #000;  
 margin:auto;  
}  
  
th, td{padding:5px;}  
  
  
  
p {  
 text-align:left;  
 text-indent: 2em;  
 padding: 0;  
 margin:0;  
}  
  
li p {  
 text-indent:0em;  
 }  
  
.references p {padding-left: 2.5em ;  
 text-indent: -2.5em;}  
  
.level1 h1 {font-size:1em;}  
  
.level2 h2 {font-size:1em;}  
  
.level3 h3 {font-size:1em;}  
  
.level4  
 h4 {font-size:1em;}  
  
h1 {  
 text-align:center;  
}  
  
h2, h3, h4, h5 {  
text-align: left;  
}  
  
h3, h4, h5 {  
margin-left: 2em;  
}  
  
.author , .date, .author\_afil h4 {text-align:left;  
 margin-left:0;  
 font-weight:normal;  
 font-style:normal;  
 padding:0px;  
 margin:0px;  
 }  
   
#header h4 em {  
 font-weight:normal;  
 font-style:normal;  
 }  
   
  
  
blockquote p {text-indent:0em;  
 margin-left:2.5em;}  
  
blockquote p + p {  
text-indent: 2.5em;  
}  
  
pre, img {  
max-width: 100%;  
}  
  
pre {  
overflow-x: auto;  
}  
  
code {  
 font-family:"Anonymous Pro",monospace;  
 text-align:left;  
 padding:5px;  
 font-size: 92%;  
 border: 1px solid #ccc;  
}  
  
pre code {  
font-size: 0.9em;  
font-family: 'Source Code Pro' !important;  
text-align: left;  
display: block; padding: 0.5em;  
}  
  
code.r {  
font-family: 'Inconsolata' !important;  
font-size: 1.2em;  
background-color: rgba(160, 160, 160, 0.2);  
}  
sup,sub {  
 position: relative;  
 vertical-align: 0;  
}  
  
sup {  
 bottom: .4em  
}  
  
sub {  
 top:.4em  
}  
  
.header th {  
 border-bottom:1px solid #000;  
 border-top: 1px solid #000;  
 font-weight: normal;  
}

**Note**: In order to compile the RMarkdown document, download [this RMarkdown document](http://my.ilstu.edu/~wjschne/442/IntroductiontoRMarkdown.Rmd), along with following files:

* [APA.docx](http://my.ilstu.edu/~wjschne/442/APA.docx) This file is a template to create MS Word documents in APA Style. The template is a work in progress and thus does not get everything exactly right.
* [apa.csl](http://my.ilstu.edu/~wjschne/442/apa.csl) This file tells RMarkdown how to format citations in APA Style.
* [citations.bib](http://my.ilstu.edu/~wjschne/442/citations.bib) This file contains a few citations in BibTeX format.

Be sure to save them in the same folder.

# RMarkdown

[Markdown](http://daringfireball.net/projects/markdown/basics) is a really simple way to format documents. [RMarkdown](http://rmarkdown.rstudio.com/) is a variant of Markdown that works in [RStudio](http://www.rstudio.com/).

With RMarkdown, you can do some really neat things. Like [this](http://my.ilstu.edu/~wjschne/RESCAE.html).

# Headers

# This is a Level 1 header

# This is a Level 1 header

## This is a Level 2 header

##This is a Level 2 header

### Guess which level header this is!

### Guess which level header this is!

This is a regular paragraph. Extra spaces between words are eliminated.   
Even though this   
sentence is broken   
across many lines,   
it is   
grouped with the text   
above it.

This is a regular paragraph. Extra spaces between words are eliminated. Even though this sentence is broken across many lines, it is grouped with the text above it.

Put an empty line between paragraphs.  
  
You can't see them but if you put 2 or more spaces   
at the end   
of a line,   
there is a line break.

Put an empty line between paragraphs.

You can’t see them but if you put 2 or more spaces  
at the end  
of a line,  
there is a line break.

# Formatting text

\*This is italicized.\*

*This is italicized.*

\*\*This is bolded.\*\*

**This is bolded.**

~~Strikethrough~~

~~Strikethrough~~

Superscript^2^

Superscript2

Subscript~2~

Subscript2

>This is for blockquotes.  
>It can go on for   
>many  
>lines.  
>  
>This is the second paragraph in a blockquote.   
In my .css file, I have formatted it so that it will be indented.

This is for blockquotes. It can go on for many lines.

This is the second paragraph in a blockquote. In my .css code, I have formatted it so that it will be indented.

Text enclosed in three backquotes (```) will   
appear in a monospace type.   
It is especially good for displaying computer code.  
It will appear exactly   
as  
 you   
 type it,  
without the typical formatting.  
  
For example,  
\*normally this would be italicized.\*

# Lists

Let’s make an unordered list:

\* First bullet point  
\* Second bullet point  
 - Indented bullet point (2 tabs or 4 spaces)  
 - Another indented bullet point  
 + Further indentation (4 tabs or 8 spaces)

* First bullet point
* Second bullet point
  + Indented bullet point (2 tabs or 4 spaces)
  + Another indented bullet point
    - Further indentation (4 tabs or 8 spaces)

Let’s make an ordered list:

1. My first topic  
 1. Sub topic 1  
 2. Sub topic 2  
2. My second topic  
 \* Subtopic (2 tabs or 4 spaces)  
 \* Another subtopic   
 This is a indented paragraph in the middle of a list (2 tabs or 4 spaces).  
 \* Yet another subtopic  
3. My third topic

1. My first topic
   1. Sub topic 1
   2. Sub topic 2
2. My second topic
   * Subtopic (2 tabs or 4 spaces)
   * Another subtopic  
     This is a indented paragraph in the middle of a list (2 tabs or 4 spaces).
   * Yet another subtopic
3. My third topic

# Links

[This is a link to my homepage.](http://my.ilstu.edu/~wjschne/)

[This is a link to my homepage.](http://my.ilstu.edu/~wjschne/)

# Images

![Ryan, Joel, and Jane](http://my.ilstu.edu/~wjschne/RyanJoelJane.jpg)



Ryan, Joel, and Jane

# Equations using LaTeX

$$f(X)=\frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{1}{2}\left(\frac{X-\mu}{\sigma}\right)^2}$$

# Simple Tables

Left |Center |Right  
:-----------|:-------------:|------------:  
1 |2 |3   
4 |5 |6   
7 |8 |9

|  |  |  |
| --- | --- | --- |
| Left | Center | Right |
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

# Combining R and Markdown

## R code chunks

This code will run and will appear in the document:

EvenNumbersUnder100 <- seq(2,98,2)

This code chunk will run but it will not appear in the document:

This code chunk will appear in the document but it will not run:

Y<-tan(pi/4)

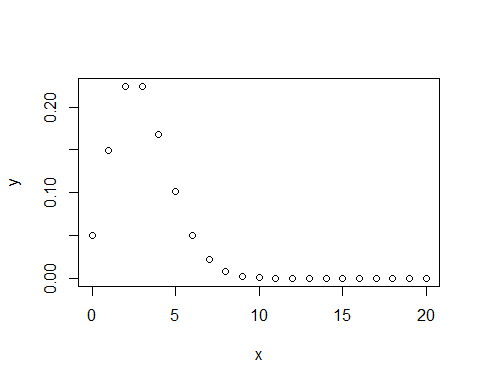
## Inline R code

You can refer to calculations in your text.   
For example, the cosine of $\pi$ radians is -1.   
In fact, you can refer to any R object   
(e.g., the mean and standard deviation of a variable.)

You can refer to calculations in your text. For example, the cosine of radians is -1. In fact, you can refer to any R object (e.g., the mean and standard deviation of a variable.)

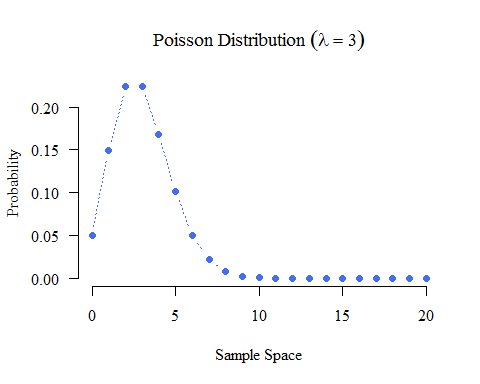
## Let’s make a simple plot with R:

# Sequence of integers from 0 to 20  
x <- 0:20  
# The probability mass function of the Poisson distribution  
y <- dpois(x, lambda = 3)  
# Plot the distribution  
plot(y ~ x)



## Let’s make the plot ready for publication:

plot(y ~ x,   
 main = expression("Poisson Distribution " \* (lambda == 3)), # Title  
 xlab = "Sample Space", # x-axis label  
 ylab = "Probability", # y-axis label  
 type = "b", # plot both lines and points  
 bty = "n", # No box around plot  
 lty = 3, # Dotted lines  
 col = "royalblue2", # Color of lines and points  
 pch = 19, # Points are filled circles  
 las = 1, # All labels are horizontal  
 family = "serif") # Font family



## APA Formatted tables!

# Sample size  
n <- 1000   
# Normal variate  
g <- rnorm(n)  
# Correlated variates  
s1 <- g + rnorm(n)   
s2 <- g + rnorm(n)  
# Create data frame  
d <- data.frame(g,s1,s2)  
# Correlation matrix  
dcor <- cor(d)  
# Format to 2 digits  
dcor <- formatC(dcor, digits = 2, format = "f")  
# Remove lower triangle  
dcor[lower.tri(dcor, diag = TRUE)] <- ""   
# Remove leading zeroes  
dcor <- gsub("0.",".",dcor)  
# Remove last row and first column  
dcor <- dcor[nrow(dcor)\*-1,-1]  
# Make table with centered columns  
knitr::kable(dcor, align = "c", digits = 2)

|  |  |  |
| --- | --- | --- |
|  | s1 | s2 |
| g | .69 | .69 |
| s1 |  | .45 |

That seems like a lot of work to get a little table. I could have cut and paste those numbers into a table in MS Word much faster! However, many correlation matrices are large and require quite a bit of attention to get them into APA format.

If you drop the above code into a custom function and modify it slightly, you have a very useful function for creating correlation tables in APA format.

CorTable <- function(d,caption = "Correlation Matrix", digits = 2, align = "c", ...){  
# Correlation matrix  
dcor <- cor(d)  
# Format to 2 digits  
dcor <- formatC(dcor, digits = 2, format = "f")  
# Remove lower triangle  
dcor[lower.tri(dcor, diag = TRUE)] <- ""   
# Remove leading zeroes  
dcor <- gsub("0.",".",dcor)  
# Remove last row and first column  
dcor <- dcor[nrow(dcor)\*-1,-1]  
# Make table with centered columns  
knitr::kable(dcor, caption = caption, digits = digits, align = align, ...)   
}

Let’s load a data set with 10 variables:

x10 <- readr::read\_csv("http://my.ilstu.edu/~wjschne/444/x10.csv")

Now you can create large correlation tables with just one line of code.

CorTable(x10)

Table 1: Correlation Matrix

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | x10 |
| x1 | .70 | .73 | .73 | .67 | .76 | .76 | .66 | .71 | .76 |
| x2 |  | .71 | .74 | .72 | .71 | .75 | .65 | .68 | .77 |
| x3 |  |  | .69 | .66 | .66 | .68 | .70 | .64 | .78 |
| x4 |  |  |  | .68 | .69 | .65 | .69 | .68 | .76 |
| x5 |  |  |  |  | .71 | .74 | .73 | .64 | .78 |
| x6 |  |  |  |  |  | .72 | .70 | .67 | .76 |
| x7 |  |  |  |  |  |  | .72 | .68 | .75 |
| x8 |  |  |  |  |  |  |  | .68 | .76 |
| x9 |  |  |  |  |  |  |  |  | .75 |

For now, there is no expectation that you should be able to create a function like this. The point is that RMarkdown is a powerful tool that can make you much more productive than people who cut and paste all their analyses into the write-up.

# Citations

As explained [here](http://rmarkdown.rstudio.com/authoring_bibliographies_and_citations.html), if you use the bibliography tag, you can insert citations with the @ symbol and the citation’s unique ID. A variety of citation file formats are supported and a huge number of citation styles are [available](https://zotero.org/styles). I am using the [BibTeX file format](http://www.bibtex.org/) with the [APA (6th Edition) citation style](https://zotero.org/styles/apa).

For example, here are some papers of mine (Kahn & Schneider, 2013; Schneider, 2013a). In this paper, Schneider (2013b, pp. 186–187) says a bunch of stuff.

Tools like these make managing references much, much easier than doing it all by hand. The references below appear like magic, all perfectly formatted.

# References

Kahn, J. H., & Schneider, W. J. (2013). It’s the destination and it’s the journey: Using multilevel modeling to assess patterns of change in psychotherapy. *Journal of Clinical Psychology*, *69*(6), 543–570.

Schneider, W. J. (2013a). Principles of assessment of aptitude and achievement. In D. Saklofske, C. Reynolds, & V. Schwean (Eds.), *The Oxford handbook of child psychological assessment* (pp. 286–330). New York: Oxford University Press.

Schneider, W. J. (2013b). What if we took our models seriously? Estimating latent scores in individuals. *Journal of Psychoeducational Assessment*, *31*(2), 186–201.