```
---
title: "R Programming Refresher"
author: "R. Burke Squires (adapted from Radina Droumeva)"
date: "7/11/2017"
output:
  html_notebook:
    toc: yes
  pdf_document:
    highlights: tango
    keep_tex: yes
    number_sections: yes
    toc: yes
---

# An Introduction to R Noebooks

Introductory material about R Notebooks:

- https://blog.rstudio.com/2016/10/05/r-notebooks/
- http://rmarkdown.rstudio.com/r_notebooks.html
- https://rviews.rstudio.com/2017/03/15/why-i-love-r-notebooks/


```{r setup, include=FALSE}
knitr::opts_chunk$set(echo = FALSE)
```

First, a short refresher to R

Variable Assignment

```{r}
x <- 5
y <- 10
x + y
```

Vectors (one dimensional) and Matrices (two dimensional)

```{r}
x <- c(1, 4, 5)
x
y <- seq(from = 1, to = 3, by = 1)
y
x + y
```

Get help on how to construct a matrix

```{r}
?matrix
A <- matrix(c(1, 2, 3,  11, 12, 13), nrow = 2, ncol = 3, byrow = TRUE)
A
rbind(x, y)
A + rbind(x, y)
A[1, 3]
A[2, ]
```
```

```
A[, 1]
```

Lists and names

```{r}
mylist <- list(`first` = x, `second` = y)
mylist
mylist[[1]]
mylist[["first"]]
# mylist[[3]]
length(mylist)
length(x)
dim(A)
```

More advanced functionality: which, intersect, union

Get help for the _rnorm_ function

```{r}
?rnorm
```

More advanced functionality: which, intersect, union

```{r}
a <- rnorm(20)
a
which(a > 0)
a[1]
a[which(a > 0)]
which(a < -1)
intersect(which(a > 0), which(a < -1))
combined <- union(which(a > 0), which(a < -1))
combined
length(combined)
```

Simple plotting

```{r}
plot(a, col = "red")
plot(density(a))
hist(a)
plot(density(rnorm(1000)))
```

Render the notebook as html

```{r}
rmarkdown::render(html_notebook)
```