Using the **R Code** and **Git Example** Environments with **knitr**

Alan's Modifications and Notes

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1 Introduction

This is a test of the **R Code** and **Git Example** environments. By the way, this document was last compiled Monday, February 17, 2014 - 6:42:28 PM.

1.1 Simple Arithmetic

R Code 1.1

```r
1 + 1
```

```
[1] 2
```

1.2 Generate Random Data

R Code 1.2

```r
set.seed(13)
x <- rnorm(100)
```

Find the standard deviation of `x`.

R Code 1.3

```r
sd(x)   # standard deviation
```

```
[1] 0.9508
```

Note that **R Code** 1.2 and 1.3 are hyperlinked! The standard deviation of `x` is computed in **R Code** 1.3 and is 0.9508.

1.3 Graphs and Environments

R Code 1.4

```r
set.seed(41)
junk <- rnorm(10000)
MEAN <- mean(junk)
MEAN
```

```
[1] 0.006227
```

The mean of the junk is 0.0062. Note: It seems that an error is thrown if a code chunk with a graph and `rcode` is executed at the same time. Work around is as shown below. That is, hide the figure when showing the code...then show the figure with a separate code chunk. Note that Figure 1 is hyperlinked!

R Code 1.5

```r
library(ggplot2)
ggplot(data = mtcars) + geom_density(aes(x = mpg), fill = "pink") + theme_bw() +
    labs(x = "miles per gallon", y = "", title = "$\\alpha + \\beta = \\delta$")
```
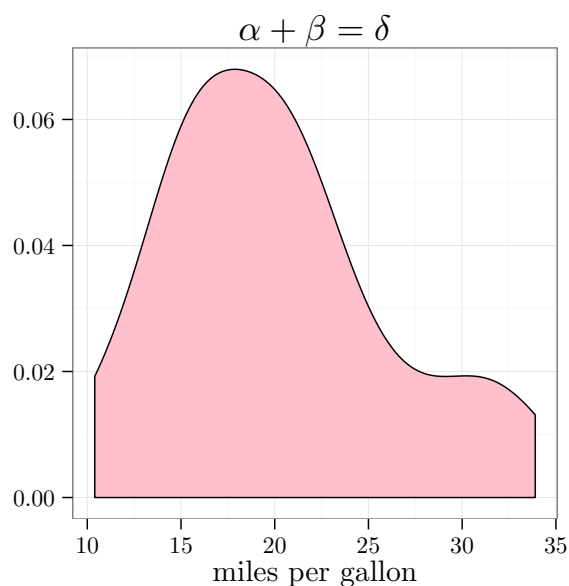

Figure 1: This is where you explain your graph

2 Git Stuff

When working with OSX, one may want to change `engine = 'sh'` to `engine = 'bash'`.
Git Example 2.1

```
git config --list

core.symlinks=false
core.autocrlf=true
color.diff=auto
color.status=auto
color.branch=auto
color.interactive=true
pack.packsizelimit=2g
help.format=html
http.sslcainfo=/bin/curl-ca-bundle.crt
sendemail.smtpserver=/bin/msmtp.exe
diff.astextplain.textconv=astextplain
rebase.autosquash=true
user.name=Alan Arnholt
user.email=arnholtat@appstate.edu
core.repositoryformatversion=0
core.filemode=false
core.bare=false
core.logallrefupdates=true
core.symlinks=false
core.ignorecase=true
core.hidedotfiles=dotGitOnly
remote.origin.fetch=+refs/heads/*:refs/remotes/origin/*
remote.origin.url=https://github.com/alanarnholt/STT4870.git
branch.master.remote=origin
branch.master.merge=refs/heads/master
```

Look at **R Code** 1.1 on page 1 to add $1+1$ and get the answer 2. The output from **Git Example** 2.1 shows how my machine is configured. **Git Example** 2.2 shows the log.
Git Example 2.2

```
git log --pretty=oneline -3

b0d54b91c0631f111c2c28818c80599ae4a1abc9 add S history link
c75781a14cea468fd4c7a4d3950e70c7a764e2fd more latex
70d81ae9c6b00e0a4b1eaddf038f730227849fbc fixed geometry
```
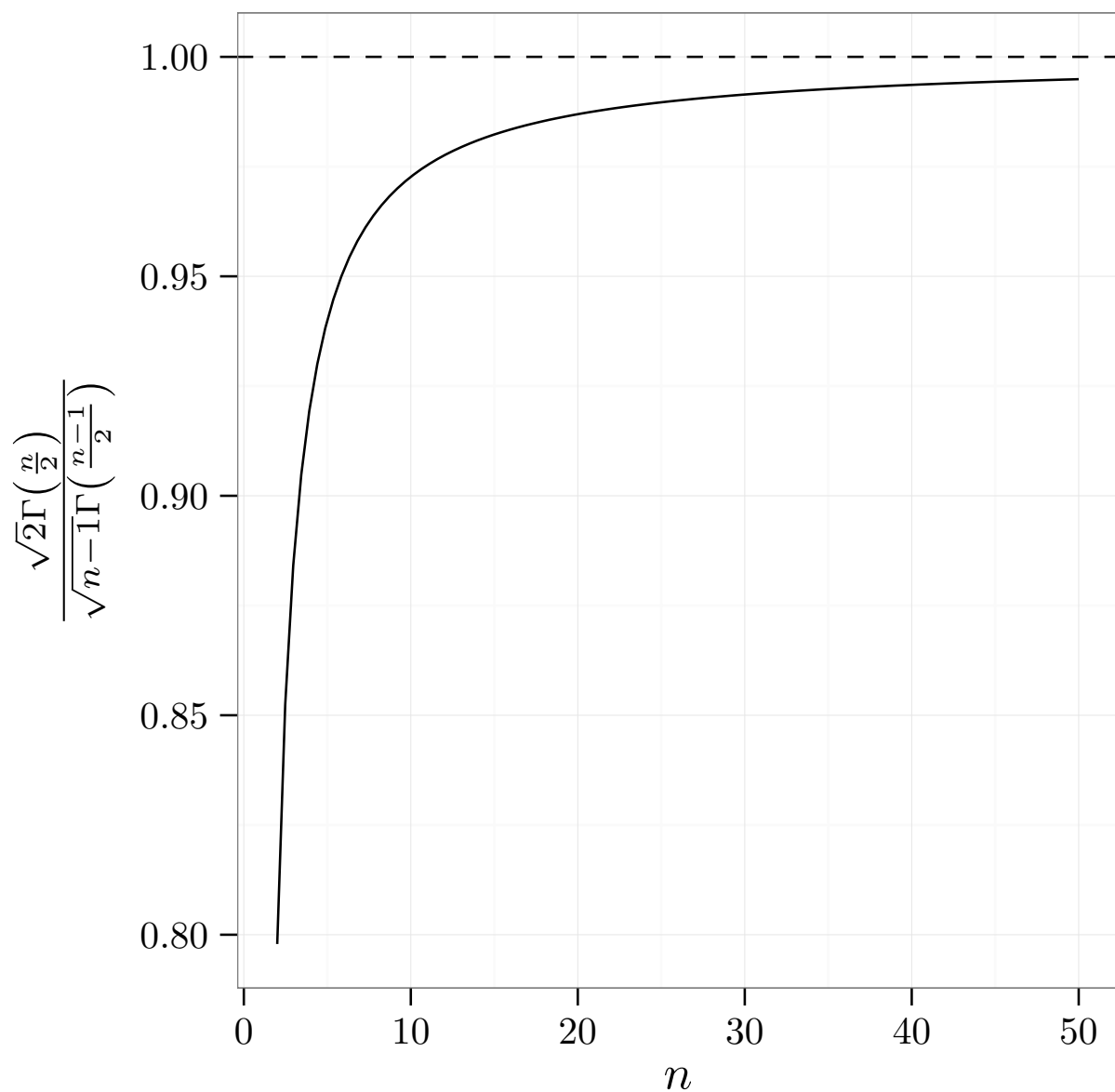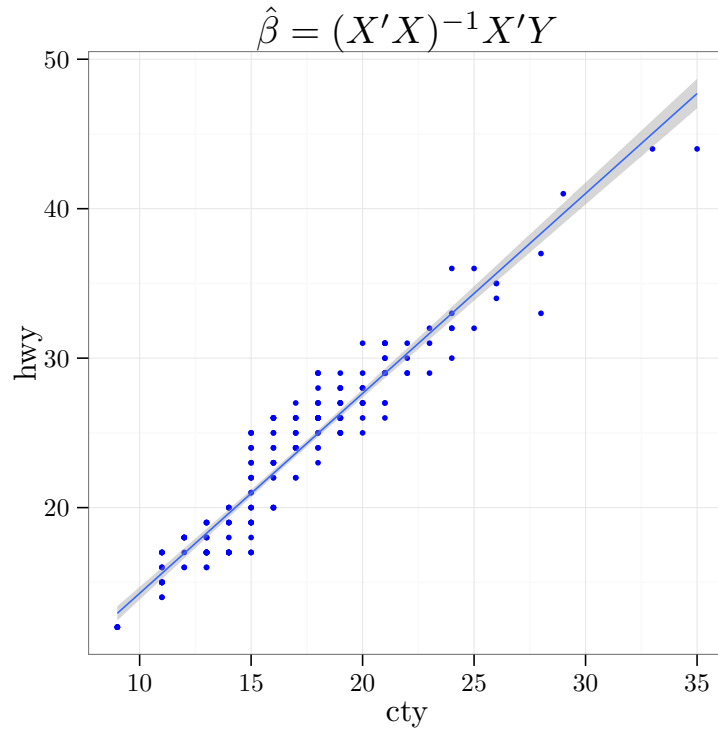
3 Using LaTeX in Graphs

How about some more LaTeX in a `ggplot2` graph.

```r
f <- function(x){sqrt(2/(x - 1))*gamma(x/2)/gamma((x - 1)/2)}
library(ggplot2)
p <- ggplot(data.frame(x = c(2, 50)), aes(x = x))
p + stat_function(fun = f) +
  labs(x = "$n$", y = "$\\frac{\\sqrt{2}\\Gamma\\left(\\frac{n}{2}\\right)}
      {\\sqrt{n-1}\\Gamma\\left(\\frac{n-1}{2}\\right)}$\n") +
  theme_bw() +
  geom_hline(yintercept = 1, lty = "dashed")
```

$$\hat{\beta} = (X'X)^{-1}X'Y$$

- R version 3.0.2 (2013-09-25), `x86_64-w64-mingw32`

- Locale: `LC_COLLATE=English_United States.1252`, `LC_CTYPE=English_United States.1252`, `LC_MONETARY=English_United States.1252`, `LC_NUMERIC=C`, `LC_TIME=English_United States.1252`

- Base packages: base, datasets, graphics, grDevices, methods, stats, utils

- Other packages: filehash 2.2-2, ggplot2 0.9.3.1, knitr 1.5, tikzDevice 0.7.0

- Loaded via a namespace (and not attached): colorspace 1.2-4, dichromat 2.0-0, digest 0.6.4, evaluate 0.5.1, formatR 0.10, grid 3.0.2, gtable 0.1.2, highr 0.3, labeling 0.2, MASS 7.3-29, munsell 0.4.2, plyr 1.8, proto 0.3-10, RColorBrewer 1.0-5, reshape2 1.2.2, scales 0.2.3, stringr 0.6.2, tools 3.0.2