STAT 8700 Homework 11

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Monday, December 12th

```
##
## *********************************************************************
## Kruschke, J. K. (2015). Doing Bayesian Data Analysis, Second Edition:
## A Tutorial with R, JAGS, and Stan. Academic Press / Elsevier.
## *********************************************************************
```

1. The file `planes.txt` contains 30 observations of 4 variables. You can read this into **R** using `read.table("planes.txt", header=T)`. The data is from 30 Air Force missions during the Vietnam war. The 4 variables are as follows:

y is the the number of damaged locations of the aircraft;

$x1$ is the type of aircraft, 0 for A4, 1, for A6;

$x2$ is the aircraft bomb load in tons;

$x3$ is the total months of aircrew experience.

Model y in JAGS using Poisson regression with a log link function. Use DIC to determine which of the three explanatory variables should be included in your model. Once you have identified the 'best' model, use it calculate 95% prediction intervals for the amount of damage for both A4 and A6 planes, with a crew with minimal, average, and maximal experience, for a minimal, average, and maximal bombload.

```r
planes <- read.table('planes.txt', header=TRUE)
```

```r
# Log Posterior (u, v space)
#fileName <- "Assignment_10_1_a"

#modelString ="
#model {
#
  #for (j in 1:count) {
```

```
    #y[j] ~ dbin(theta[j], N[j])
    #theta[j] ~ dbeta(alpha, beta)
  #}
#
#
#
#
  #lnx <- log(alpha / beta)
  #lny <- log(alpha + beta)
#
  #alpha <- u / pow(v, 2)
  #beta <- (1 - u) / pow(v, 2)
#
  #u ~ dunif(-2, 4)
  #v ~ dunif(-5, 13)
  ##u ~ dunif(0.09, 0.22)
  ##v ~ dunif(0.08, 0.61)
#}
#"
#
#writeLines(modelString, con=fileName)
#
#basementsModel = jags.model(file=fileName,
                             #data=list(y=basement.data$y,
                                       #N=basement.data$N,
                                       #count=length(basement.data$N)),
                             #n.chains=4)
#
#update(basementsModel, n.iter=10000)


#basementsSamples <- coda.samples(basementsModel, n.iter=200000, variable.names=c("alpha", "beta", "the
#
#basementsSamples.M <- as.matrix(basementsSamples)

#summary(basementsSamples.M)
```