npc_linreg

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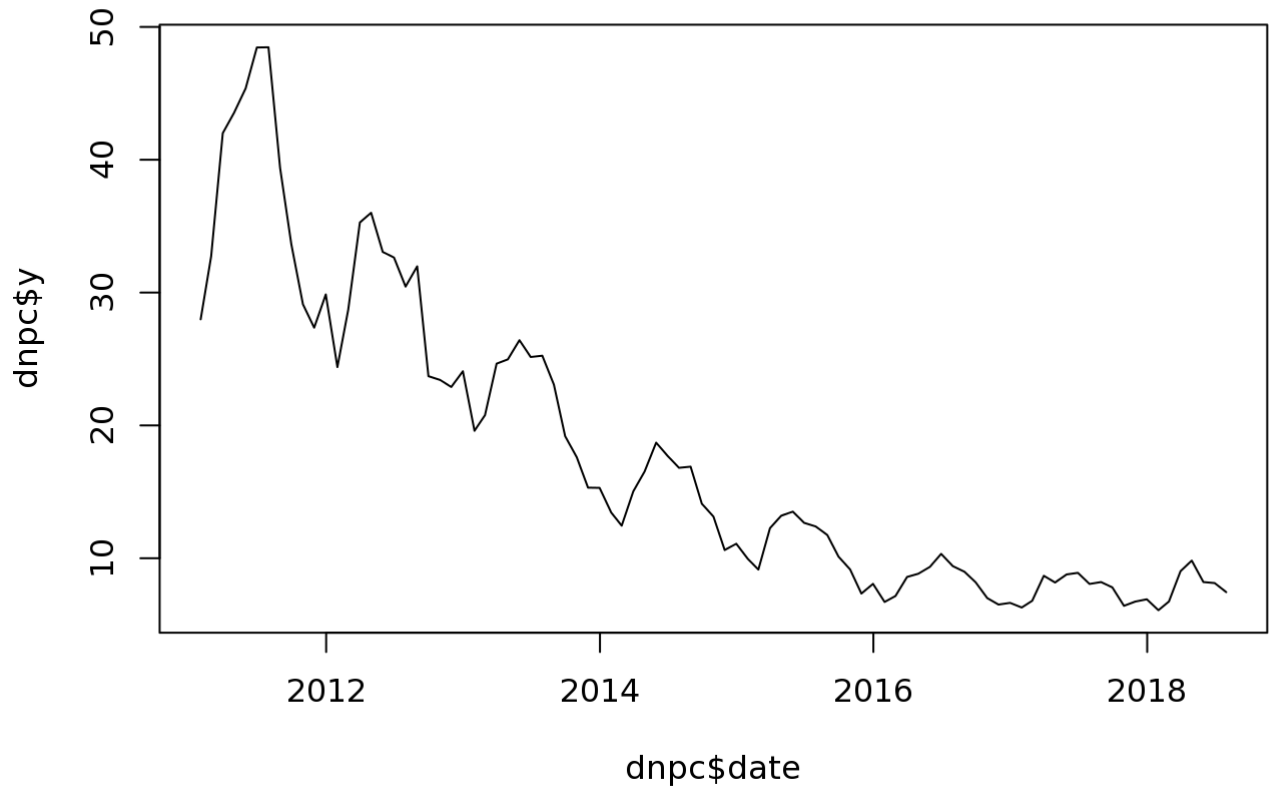
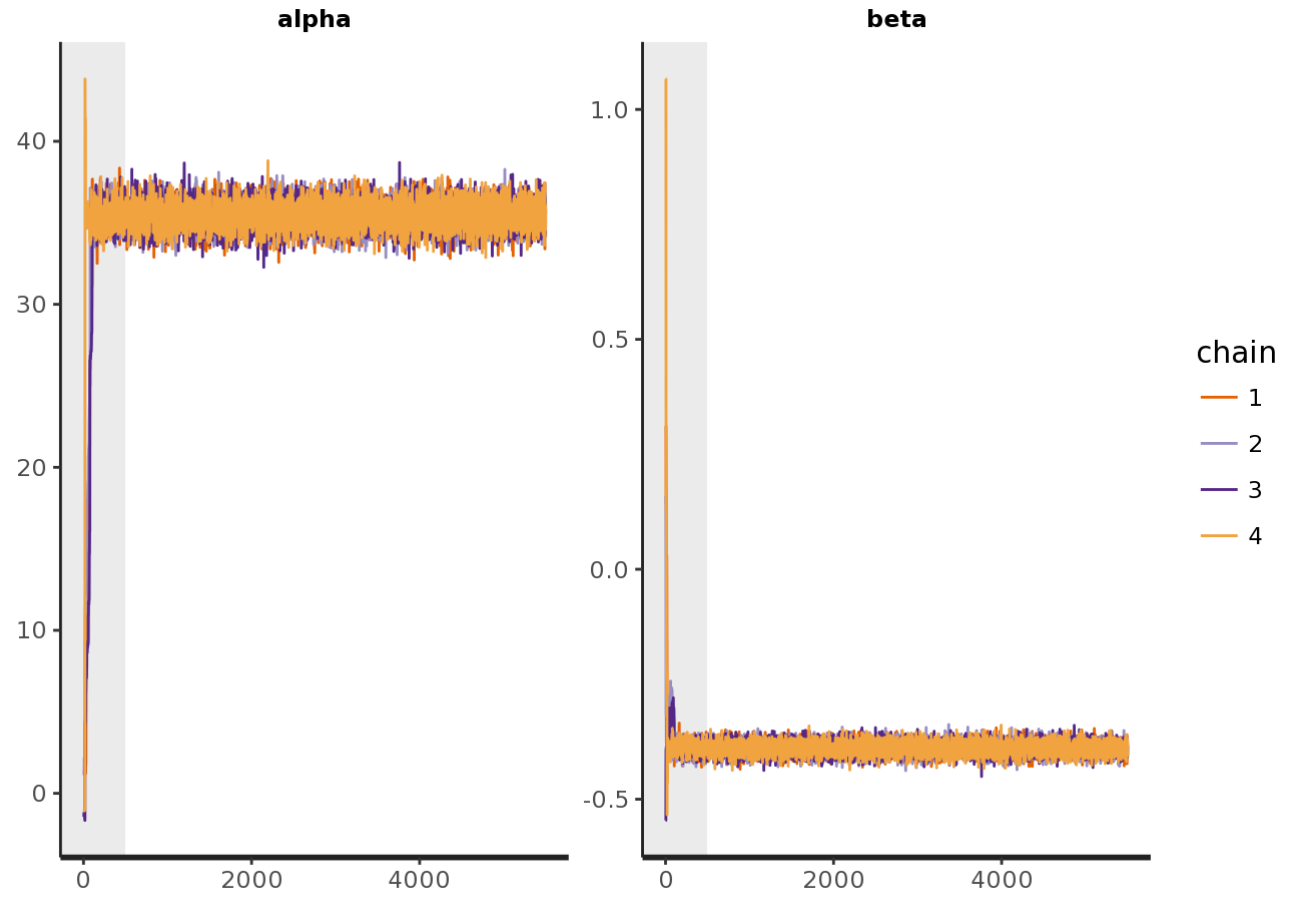
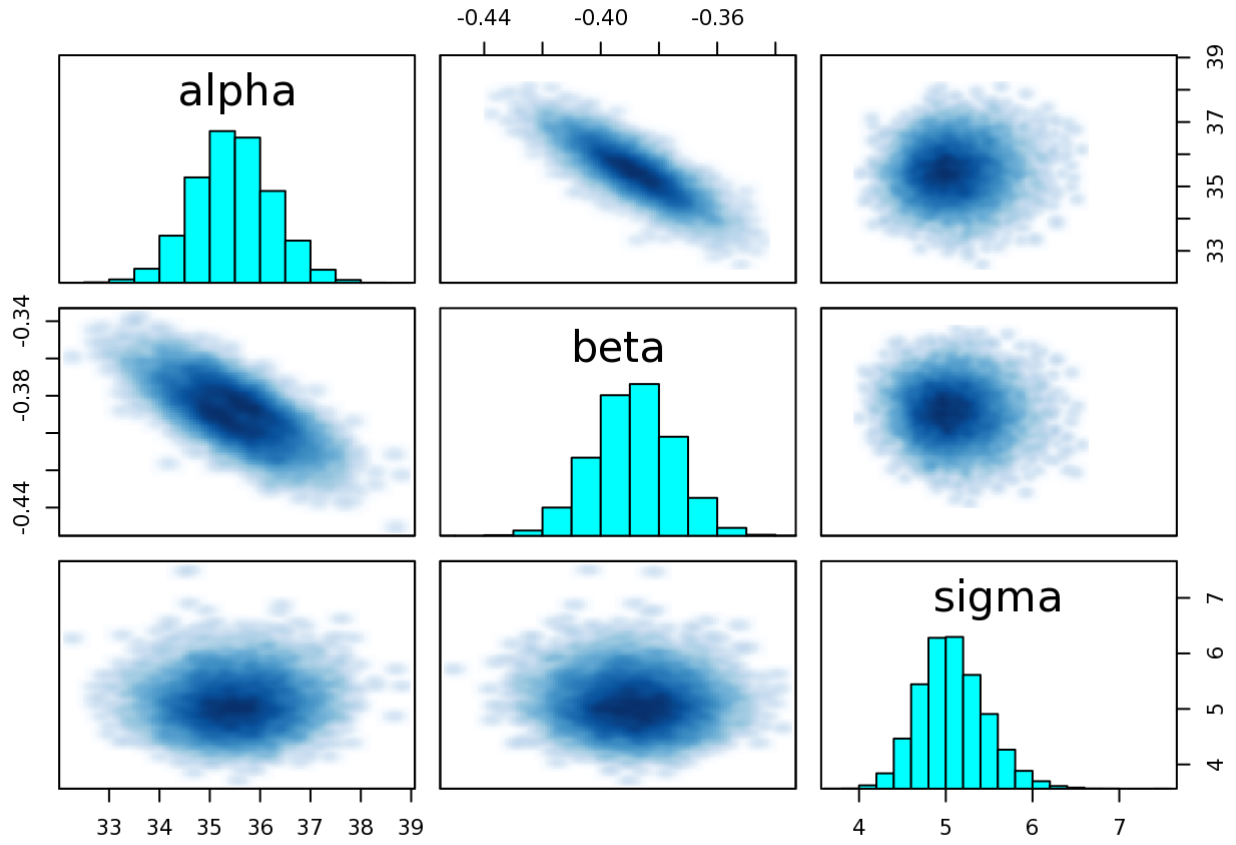
```
suppressMessages(library('rstan'))
options(mc.cores = parallel::detectCores())
rstan_options(auto_write = TRUE)

#load npc data
dnpc <- read.csv("New Policy Count.csv", sep = "\t")
#View(dnpc)



dnpc <- dnpc[,1:3] #get rid of cols
names(dnpc) <- c("t", "date", "y") #name cols
dnpc <- subset(dnpc, !is.na(y)) #get rid of nans (missing data for most recent months)
dnpc$y <-  dnpc$y/1e3 #make smaller
dnpc$date <- as.Date(dnpc$date, '%m/%d/%Y')
plot(dnpc$y~dnpc$date,type='l')
```



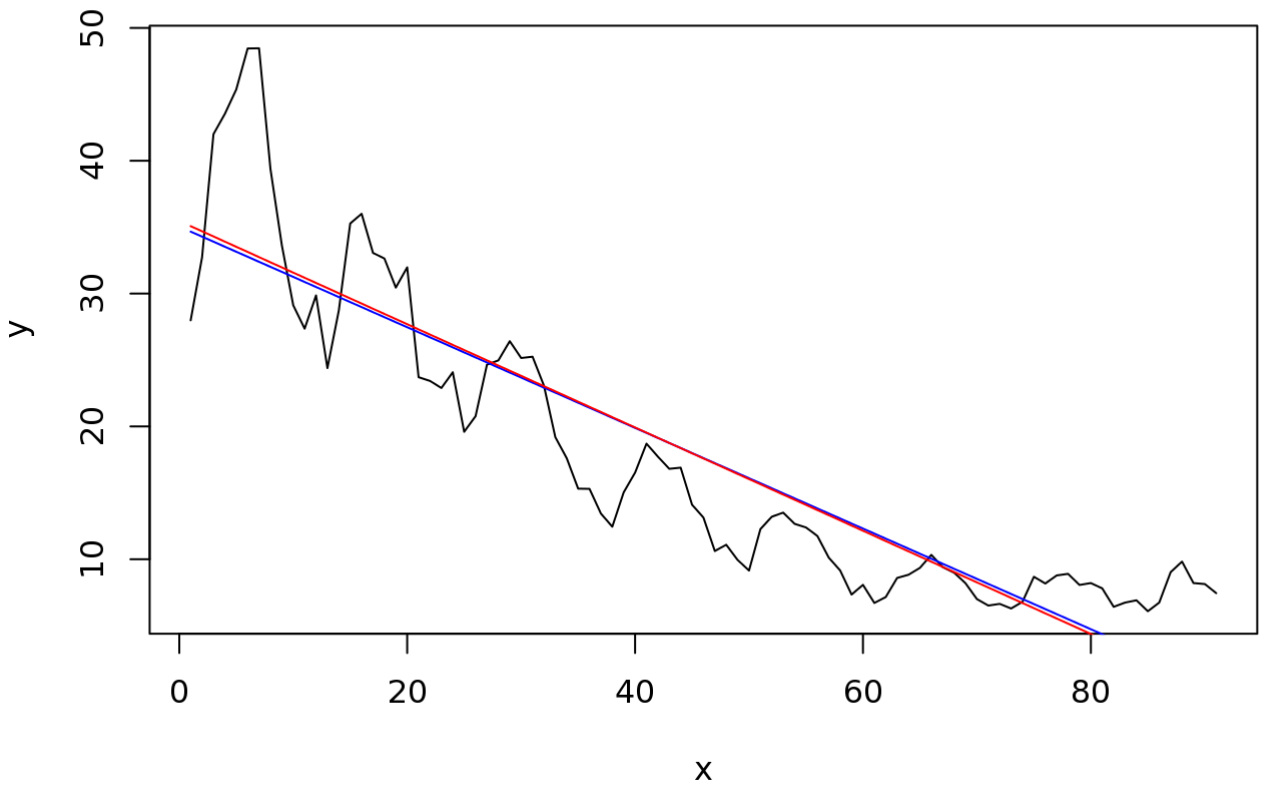
```
#do linear regression w/ r
linregr <- lm(y ~ t, data = dnpc) #do linreg
lrrsum <- summary(linregr)$coefficients
alphar <-  lrrsum['(Intercept)','Estimate']
betar <-  lrrsum['t','Estimate']

dnpc$yhatlrr <- fitted(linregr) #add linreg prediction to dnpc
#View(dnpc)

#do linear regression w/ stan
##get data, need Ndates,x,y
N <- nrow(dnpc) #dim(dnpc)[1]
x <- dnpc$t
y <- dnpc$y
standata <- list(N=N, x=x, y=y)

#fit
linregstan <- stan(file='npc_linreg.stan', data=standata, warmup = 500, iter = 5500)

#look at fit parms/convergence
plot(linregstan, plotfun='trace', pars = c('alpha','beta'), inc_warmup=TRUE)
```




```
pairs(linregstan, pars=c('alpha','beta','sigma'))
```




```
lrstansum <- summary(linregstan, pars=c('alpha','beta','sigma'))$summary
alphastan <-  lrstansum['alpha','mean']
betastan <- lrstansum['beta','mean']
dnpc$yhatlrstan <- betastan*dnpc$t+alphastan
#View(dnpc)

#plot results
plot(x,y,type='l')
lines(x, dnpc$yhatlrr, col='blue')
lines(x, dnpc$yhatlrstan, col='red')
```




```
##kewl, they are consistent
```