

106th HOUSE EXAMPLE (Continued)

RtoWINBUGS

STATA OUTPUT

. summ

Variable	Obs	Mean	Std. Dev.	Min	Max
bush00	432	46.81019	14.36873	6	80
gore00	432	49.71296	14.005	20	93
black00	432	12.68333	16.25699	.3	96
south	432	.3101852	.4631056	0	1
hispanic00	432	12.31597	16.25281	.6	86
income	432	30.75224	8.319547	15.06	57.219
owner00	432	65.86875	11.92404	8	84.3
dwnomln	432	.0586875	.4671698	-.815	1.269
dwnom2n	432	-.0381065	.4706545	-1.123	1.27
ybush	432	.4861111	.5003865	0	1
ygore	432	.4375	.4966535	0	1

. probit ybush black00 south hispanic00 income owner00 dwnomln dwnom2n

Iteration 0: log likelihood = -299.27289
 Iteration 1: log likelihood = -154.89847
 Iteration 2: log likelihood = -134.46169
 Iteration 3: log likelihood = -130.43351
 Iteration 4: log likelihood = -130.12954
 Iteration 5: log likelihood = -130.12789
 Iteration 6: log likelihood = -130.12789

Probit estimates	Number of obs	=	432
	LR chi2(7)	=	338.29
	Prob > chi2	=	0.0000
Log likelihood = -130.12789	Pseudo R2	=	0.5652

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
black00	-.0285973	.0097913	-2.92	0.003	-.0477878 - .0094067
south	.7695862	.2545783	3.02	0.003	.2706219 1.268551
hispanic00	-.0089458	.0069163	-1.29	0.196	-.0225015 .0046099
income	-.0241489	.0126394	-1.91	0.056	-.0489217 .0006239
owner00	.0235461	.0143687	1.64	0.101	-.0046161 .0517083
dwnomln	2.761974	.2619813	10.54	0.000	2.2485 3.275448
dwnom2n	1.136417	.2339829	4.86	0.000	.6778186 1.595015
_cons	-.9697998	1.077738	-0.90	0.368	-3.082127 1.142528

R Program to Run RtoWINBUGS

```
#
# Attempt to Run simple Probit Copying Ernesto's Code
#
library(arm)
setwd("C:/calvo")
data = read.dta("hdmg106_2009_fixed.dta")
attach(data)

V <-
cbind(ybush,black00,south,hispanic00,income,owner00,dwnom1n,dwnom2n)

N = nrow(data)
K = ncol(V)
data.data = list(N=N,K=K,V=V)
data.inits = function() {list(beta=runif(K,-2,2), delta=runif(N,-1,1))}
data.parameters = c("beta")
wide.sim = bugs(data.data, data.inits,
data.parameters,"h106_probit_BUGS_model.txt", n.chains=4, n.thin=1,
n.burnin=15000,n.iter=40000, debug=T)

detach(data)
```

WINBUGS Model Called by R2WINBUGS

```
model
{
# X[,1] = 1 if bush vote >= 50%
# X[,2] = 1 if Gore vote >= 50%
# X[,3] = Bush Percentage in CD
# X[,4] = Gore Percentage in CD
# X[,5] = Black Percentage in CD
# X[,6] = 1 if Southern State (11 states of Confederacy + OK + KY
# X[,7] = Hispanic Percentage in CD
# X[,8] = Median Family Income (in thousands) in CD
# X[,9] = Percent Owner-Occupied Housing
# X[,10] = DW-NOMINATE 1st Dimension
# X[,11] = DW-NOMINATE 2nd Dimension
#
# PRIORS
#
#       for (k in 1 : K) { beta[k] ~ dnorm(0,0.001)} # vague priors
#
# LIKELIHOOD
#
#       for (i in 1 : N) # loop over congressional districts
#       {
#
#           V[i,1] ~ dbern(p[i]);
#           probit(p[i]) <- delta[i]
#           delta[i] ~ dnorm(mu[i], 1.0)I(-4, 4)
#           mu[i] <-
beta[1]+V[i,2]*beta[2]+V[i,3]*beta[3]+V[i,4]*beta[4]+V[i,5]*beta[5]+V[i
,6]*beta[6]+V[i,7]*beta[7]+V[i,8]*beta[8]
#
# Borrowed From Simon Jackman
#
#           llh[i] <- V[i,1]*log(p[i]) + (1-V[i,1])*log(1-p[i]);
#       }
#       sumllh <- sum(llh[]);
#
# }
}
```

Log File From R2WINBUGS

```
display(log)
check(C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/h106_probit_BUGS_model.txt)
model is syntactically correct
data(C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/data.txt)
data loaded
compile(4)
model compiled
inits(1,C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/inits1.txt)
chain initialized but other chain(s) contain uninitialized variables
inits(2,C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/inits2.txt)
chain initialized but other chain(s) contain uninitialized variables
inits(3,C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/inits3.txt)
chain initialized but other chain(s) contain uninitialized variables
inits(4,C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/inits4.txt)
model is initialized
gen.inits()
command #Bugs:gen.inits cannot be executed (is greyed out)
```

```

thin.updater(1)
update(15000)
set(beta)
set(deviance)
dic.set()
update(25000)
coda(*,C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/coda)
stats(*)

```

Node statistics

	mean	sd	MC error	2.5%	median	97.5%	start	sample
beta[1]	0.6562	0.8356	0.00638	-0.9668	0.6514	2.317	15001	100000
beta[2]	-0.011	0.006795	4.943E-5	-0.02414	-0.01107	0.002403	15001	100000
beta[3]	0.4022	0.2405	0.001883	-0.07176	0.4037	0.8701	15001	100000
beta[4]	-0.009365	0.006931	5.422E-5	-0.02291	-0.009402	0.00431	15001	100000
beta[5]	-0.03246	0.01346	1.107E-4	-0.05866	-0.03242	-0.006056	15001	100000
beta[6]	0.004265	0.01099	8.299E-5	-0.01747	0.004343	0.0256	15001	100000
beta[7]	2.781	0.234	0.001743	2.32	2.781	3.237	15001	100000
beta[8]	0.9219	0.2403	0.001982	0.451	0.9218	1.395	15001	100000
deviance	239.8	14.69	0.05129	211.9	239.5	269.4	15001	100000

dic.stats()

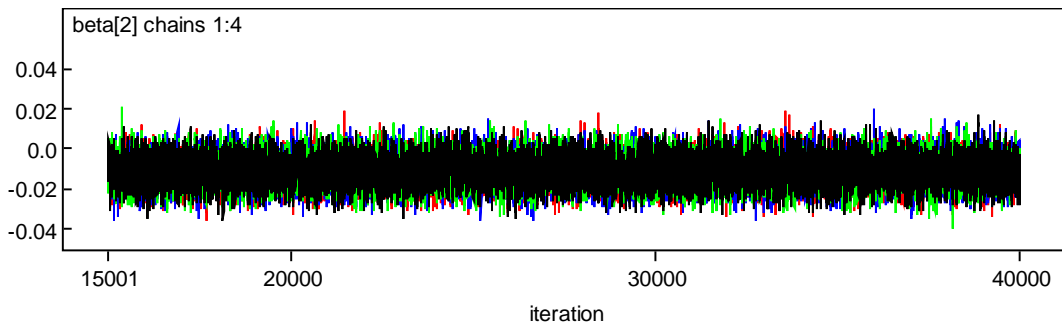
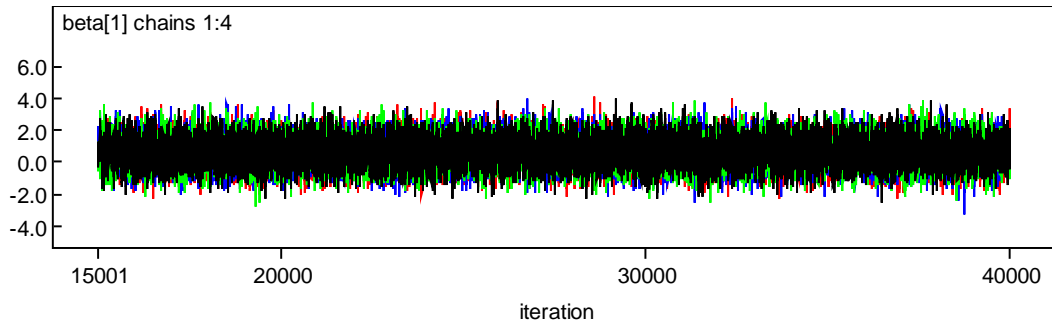
DIC

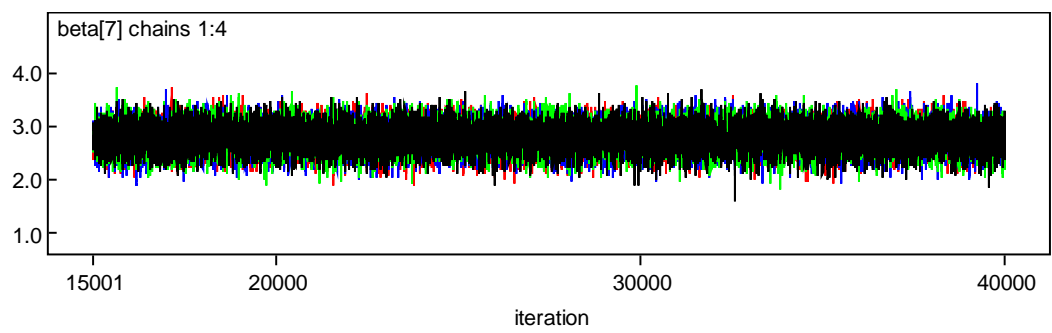
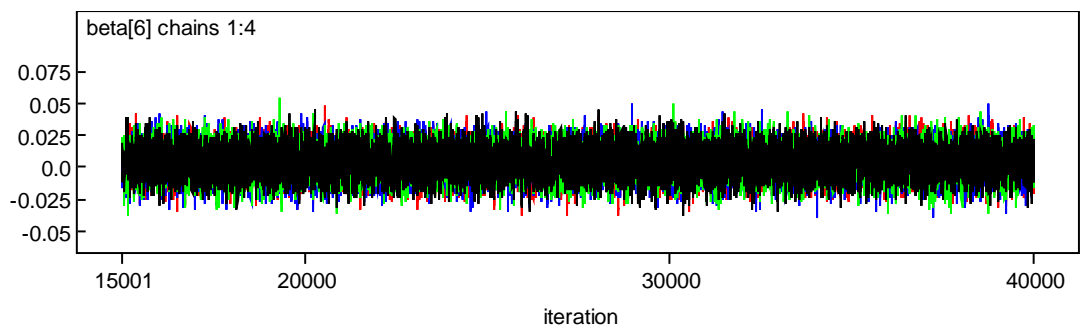
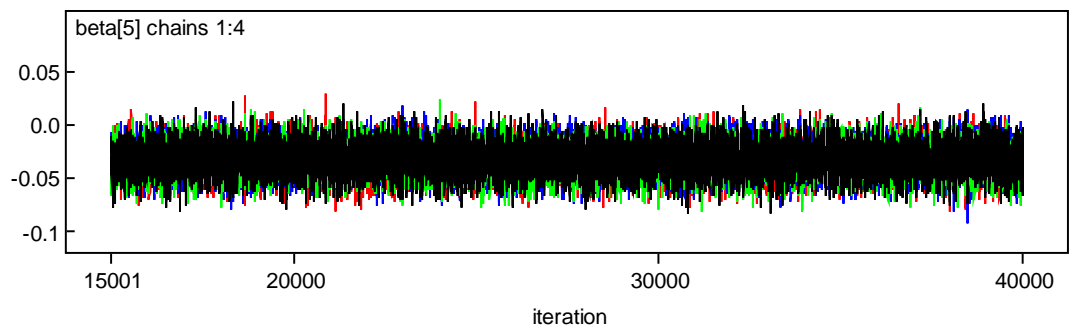
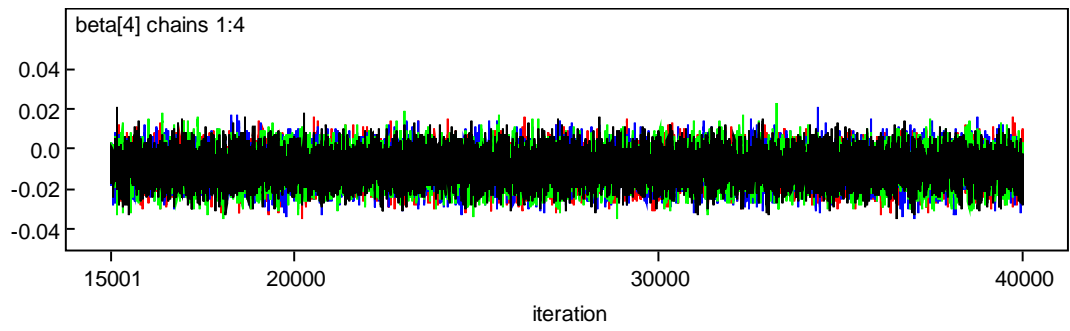
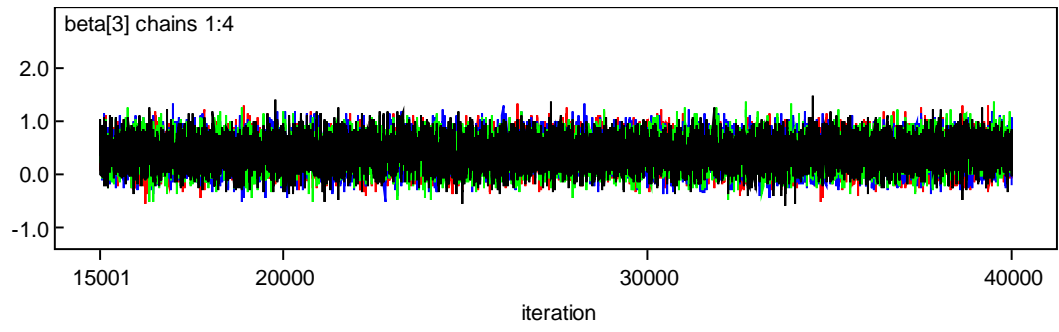
Dbar = post.mean of -2logL; Dhat = -2LogL at post.mean of stochastic nodes

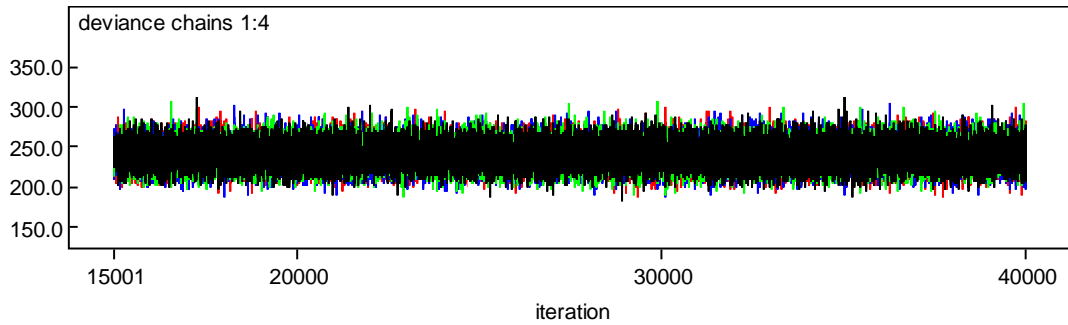
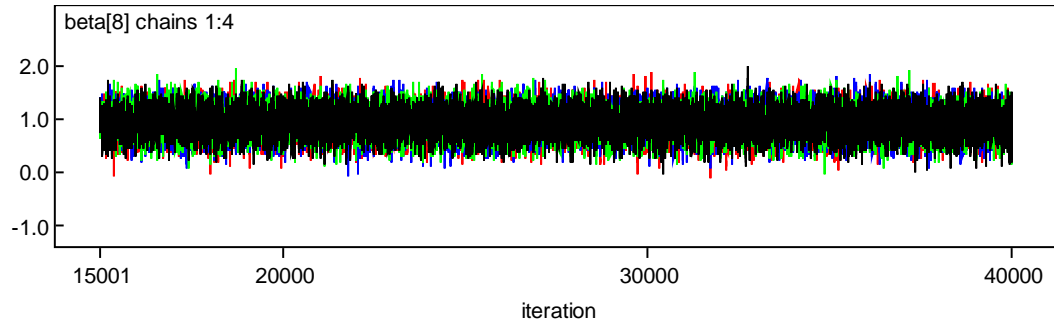
	Dbar	Dhat	pD	DIC
V	217.964	131.091	86.873	304.838
delta	21.844	19.205	2.639	24.483
total	239.809	150.296	89.512	329.321

history(*,C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/history.odc)

History



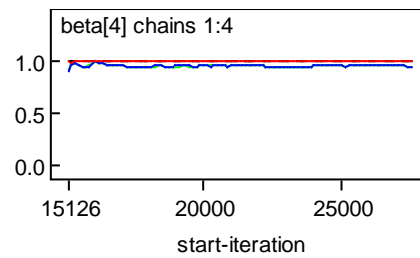
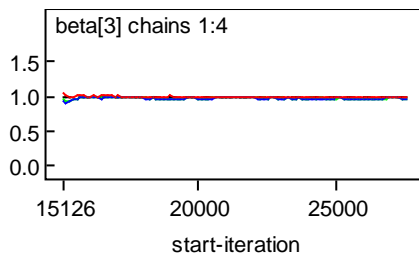
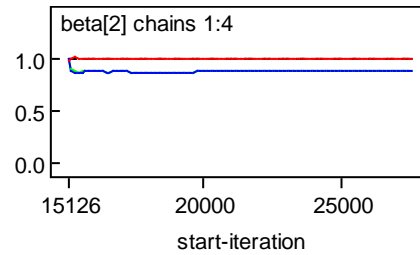
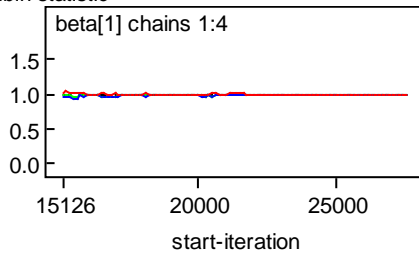


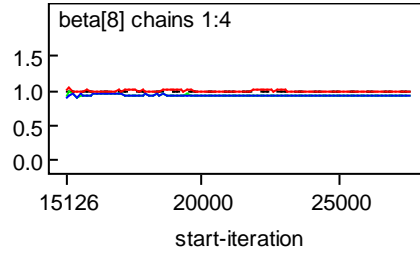
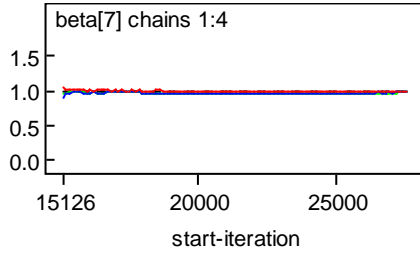
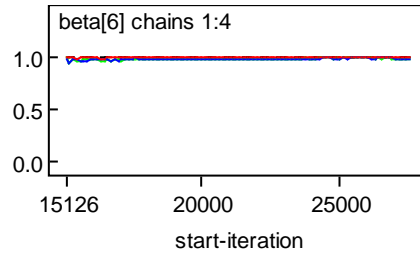
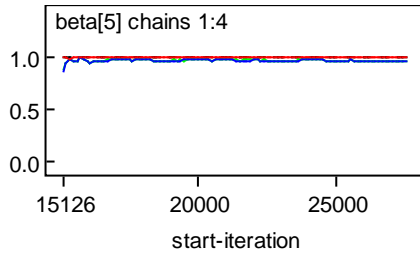


save(C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/log.odc)
 save(C:/DOCUME~1/ADMINI~1/LOCALS~1/Temp/Rtmp4n72cs/log.txt)

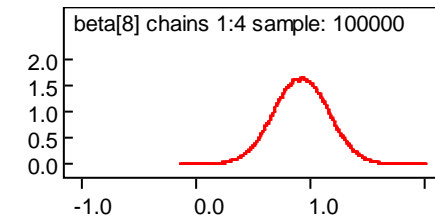
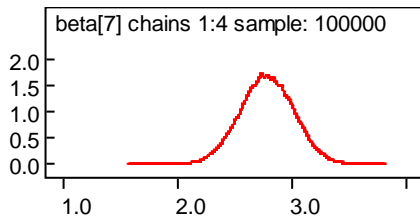
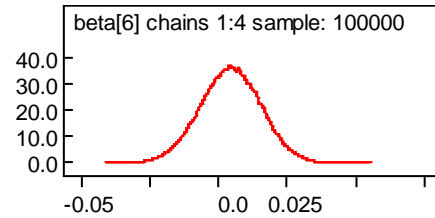
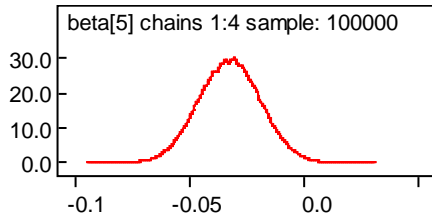
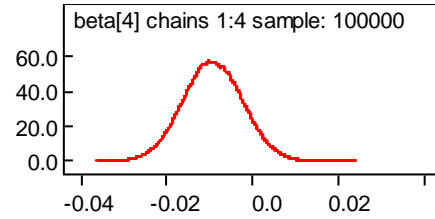
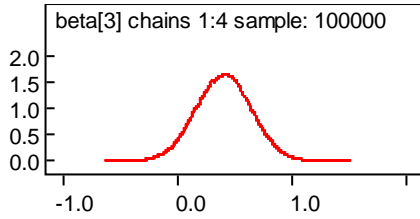
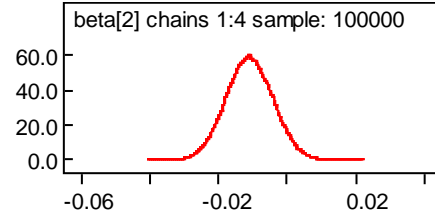
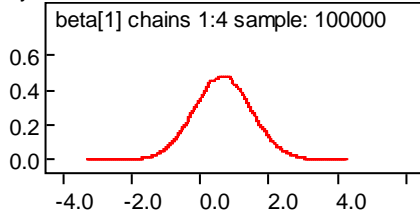
Output Done While WINBUGS Is Still Running

Gelman Rubin statistic





Kernel density



Autocorrelation function

