[ESC] Bayes Week6 HW

SonJiwoo

2021-02-21

1. Poisson Regression

```
#### Sparrow data
load("data/sparrows.RData")
fledged<-sparrows[,1] ; age<-sparrows[,2] ; age2<-age^2
```

Figure 10.5

```
#### Figure 10.5
par(mar=c(2.75,2.75,.5,.5),mgp=c(1.7,.7,0))
par(mfrow=c(1,3))
blabs<-c(expression(beta[1]),expression(beta[2]),expression(beta[3]))
thin<-c(1,(1:1000)*(S/1000))
j<-3
plot(thin,BETA[thin,j],type="l",xlab="iteration",ylab=blabs[j])
abline(h=mean(BETA[,j]) )

acf(BETA[,j],ci.col="gray",xlab="lag")
acf(BETA[thin,j],xlab="lag/10",ci.col="gray")
```

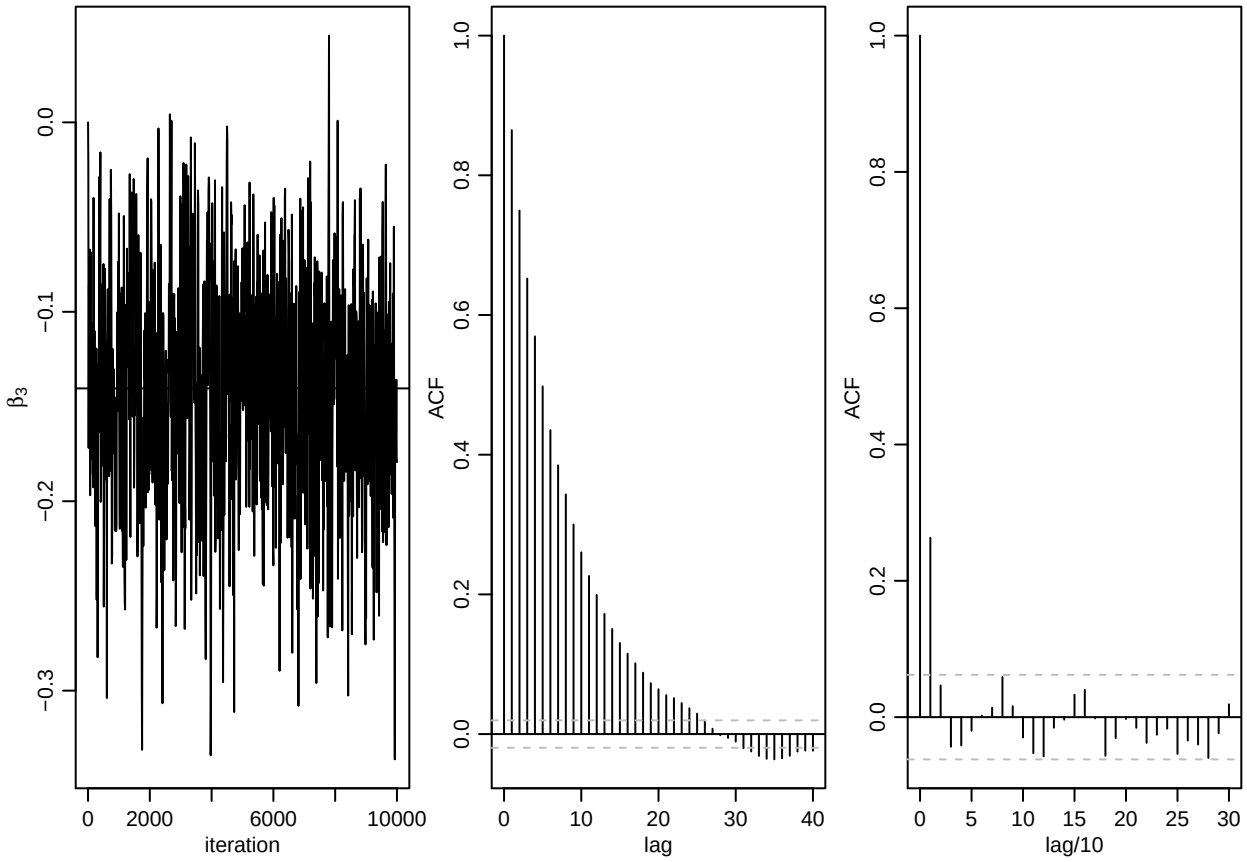


Figure 10.6

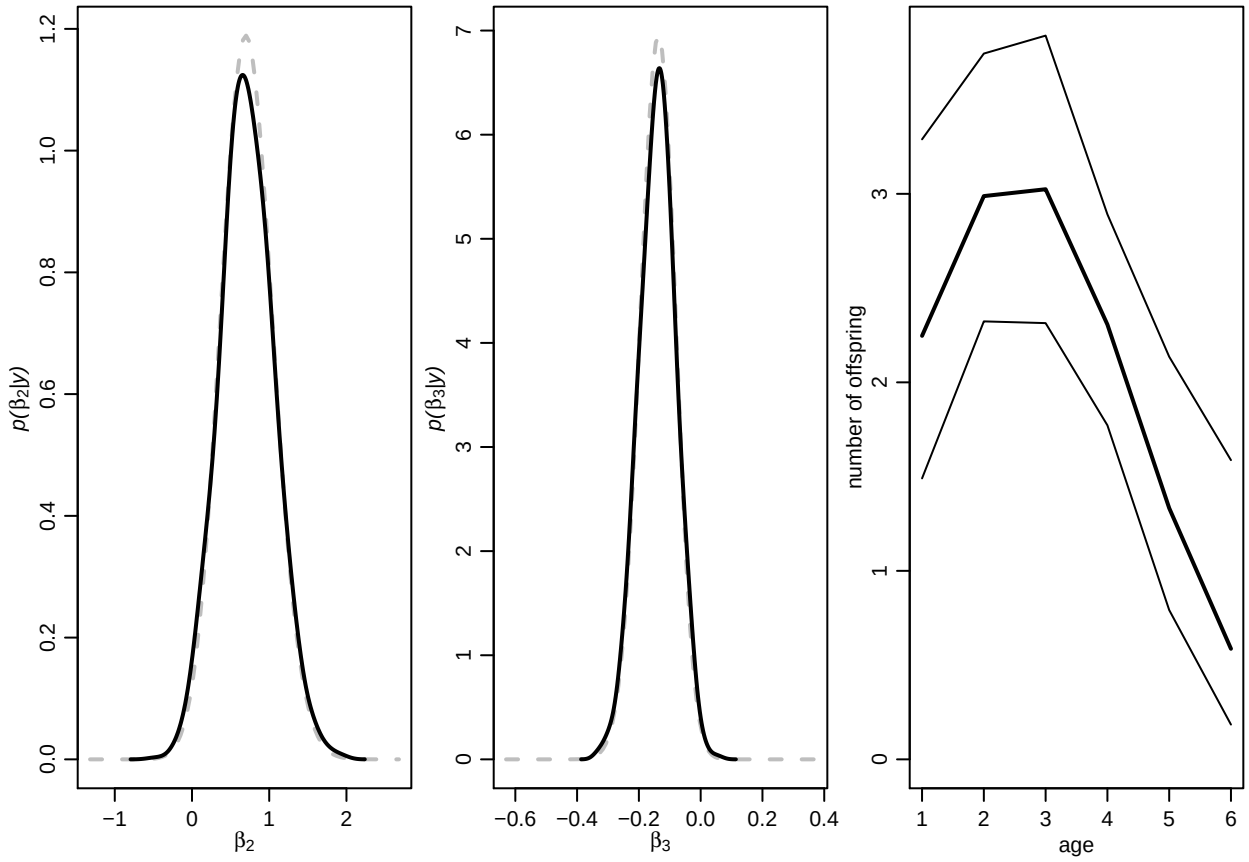
```
#### Figure 10.6
par(mar=c(2.75,2.75,.5,.5),mgp=c(1.7,.7,0))
par(mfrow=c(1,3))

plot(beta2,PB2*length(beta2)/(max(beta2)-min(beta2)) ,type="l",xlab=expression(beta[2]),ylab=expression
lines(density(BETA[,2],adj=2),lwd=2)

plot(beta3,PB3*length(beta3)/(max(beta3)-min(beta3)),type="l",xlab=expression(beta[3]),ylab=expression(
lines(density(BETA[,3],adj=2),lwd=2)

Xs<-cbind(rep(1,6),1:6,(1:6)^2)
eXB.post<- exp(t(Xs%*%t(BETA )) )
qE<-apply( eXB.post,2,quantile,probs=c(.025,.5,.975))

plot( c(1,6),range(c(0,qE)),type="n",xlab="age",
      ylab="number of offspring")
lines( qE[1,],col="black",lwd=1)
lines( qE[2,],col="black",lwd=2)
lines( qE[3,],col="black",lwd=1)
```



2. Regression Model with Autocorrelation Errors

```
#### Ice core example
load("data/icecore.RData")
```

Figure 10.9

```
#### Figure 10.9
par(mar=c(3,3,1,1),mgp=c(1.75,.75,0))
par(mfrow=c(1,2))
plot(OUT.1000[,4],xlab="scan",ylab=expression(rho),type="l")
acf(OUT.1000[,4],ci.col="gray",xlab="lag")
```

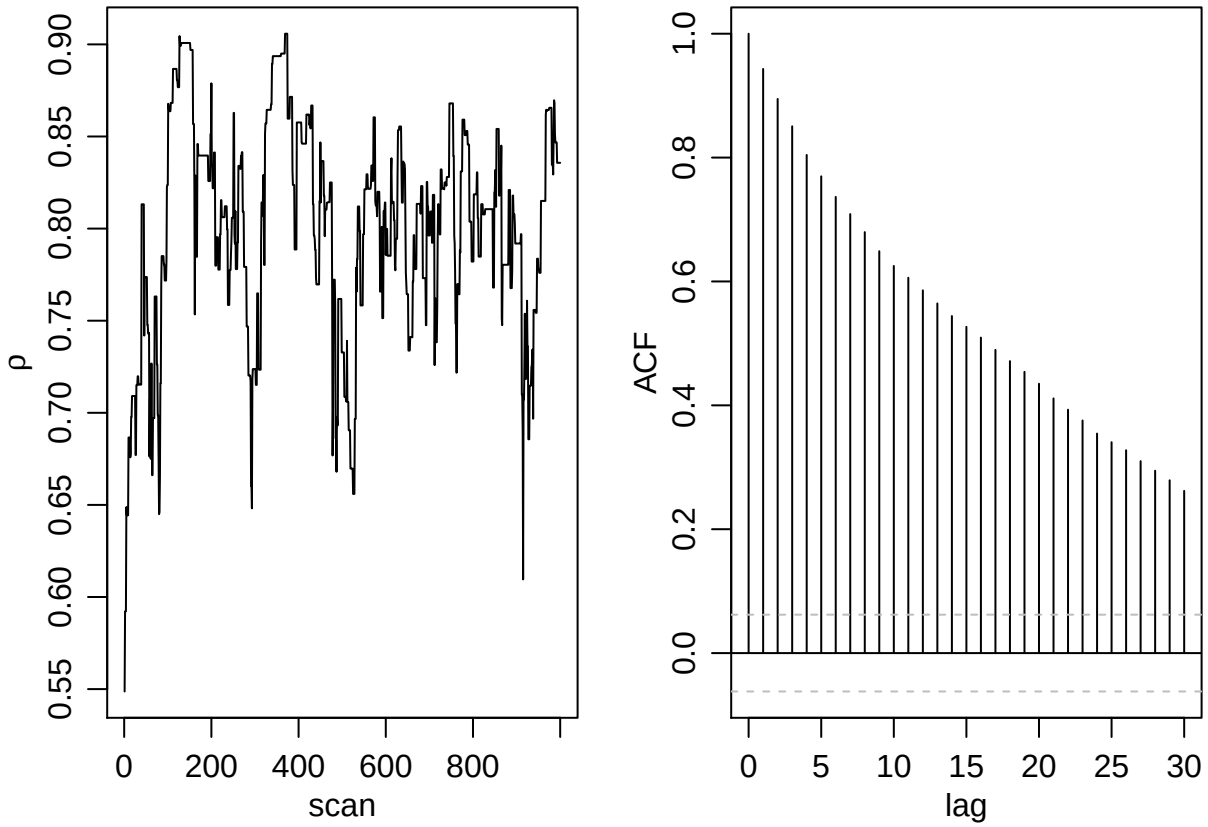


Figure 10.10

```
#### Figure 10.10
par(mar=c(3,3,1,1),mgp=c(1.75,.75,0))
par(mfrow=c(1,2))
plot(OUT.25000[,4],xlab="scan/25",ylab=expression(rho),type="l")
acf(OUT.25000[,4],ci.col="gray",xlab="lag/25")
```

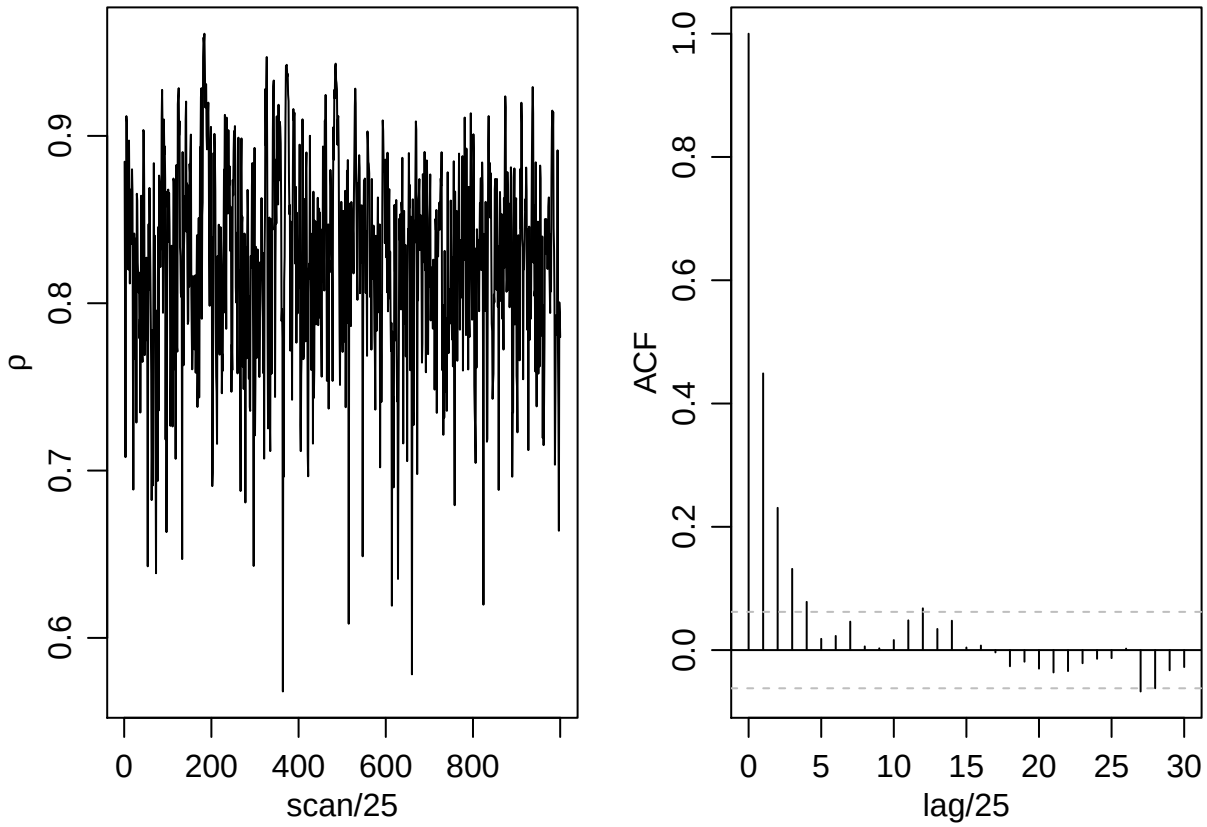
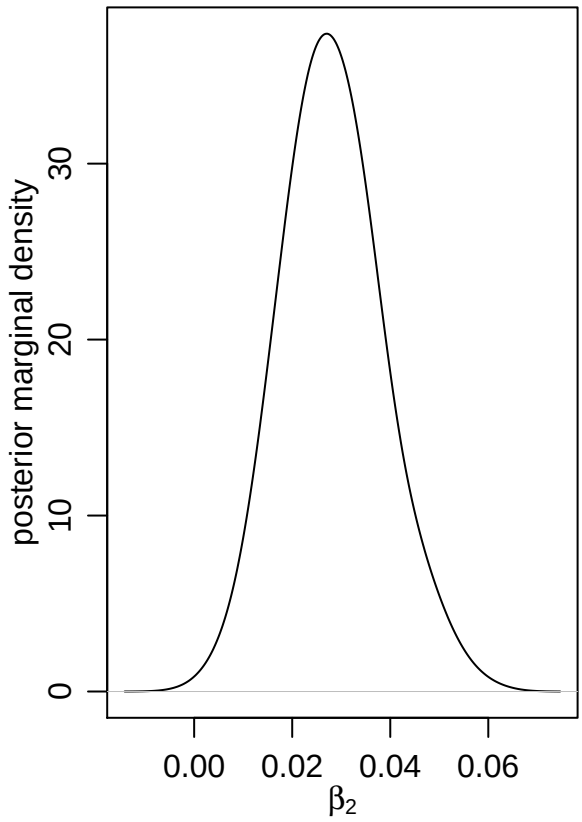


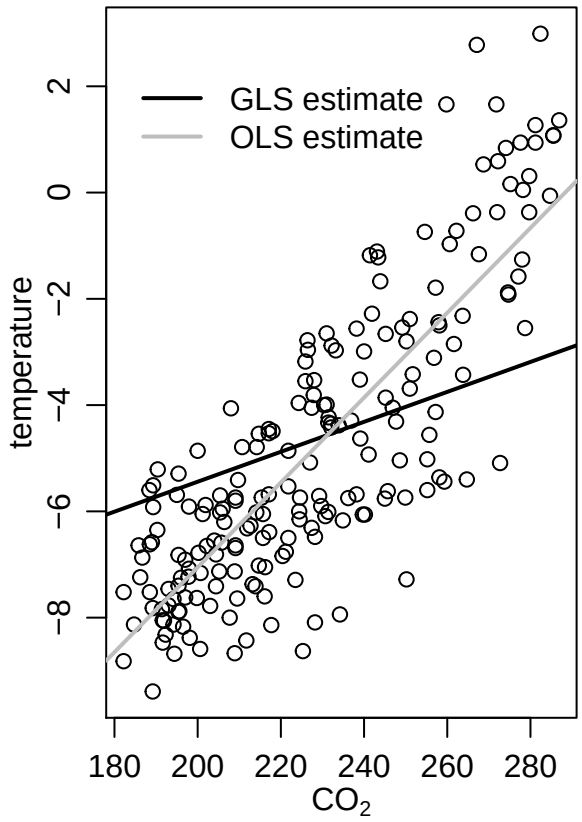
Figure 10.11

```
#### Figure 10.11
par(mar=c(3,3,1,1),mgp=c(1.75,.75,0))
par(mfrow=c(1,2))

plot(density(OUT.25000[,2],adj=2),xlab=expression(beta[2]),
     ylab="posterior marginal density",main="")

plot(y~X[,2],xlab=expression(CO[2]),ylab="temperature")
abline(mean(OUT.25000[,1]),mean(OUT.25000[,2]),lwd=2)
abline(lmfit$coef,col="gray",lwd=2)
legend(180,2.5,legend=c("GLS estimate","OLS estimate"),bty="n",
       lwd=c(2,2),col=c("black","gray"))
```


posterior marginal density
0
10
20
30
0.00
0.02
0.04
0.06
β2


GLS estimate
OLS estimate
temperature
−8
−6
−4
−2
0
2
180
200
220
240
260
280
CO2