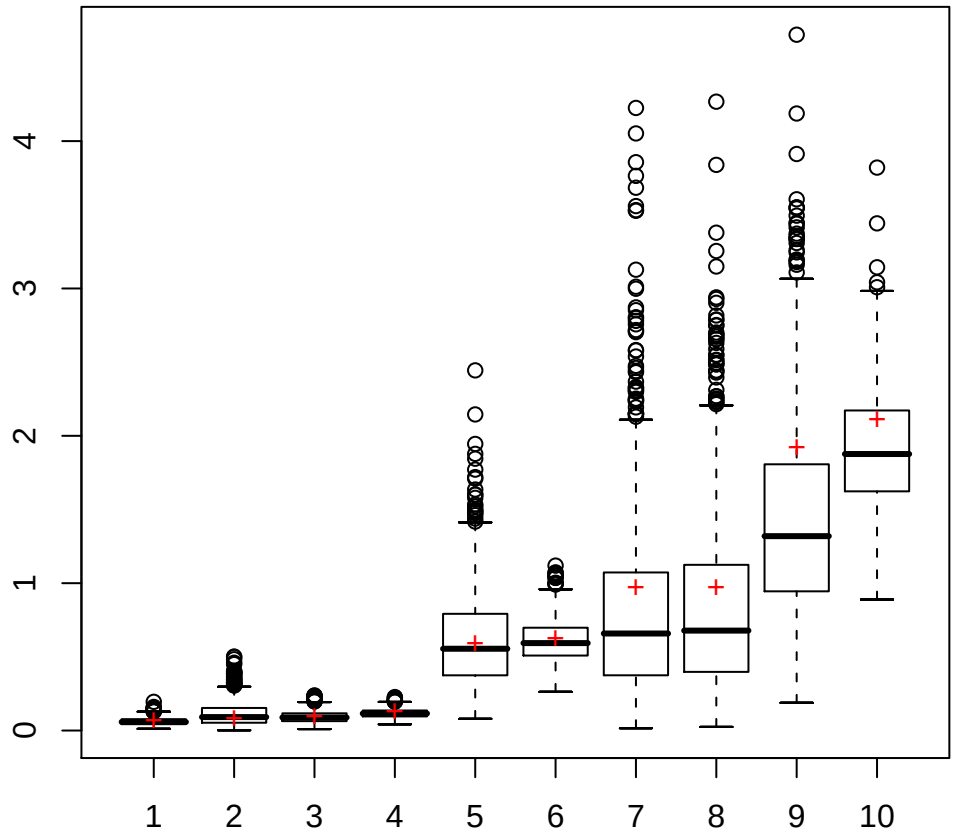
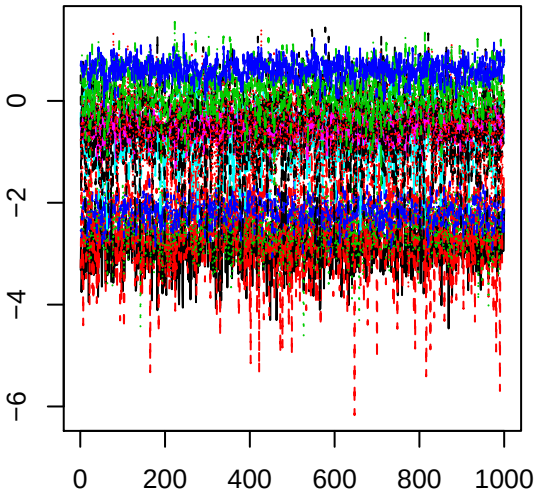
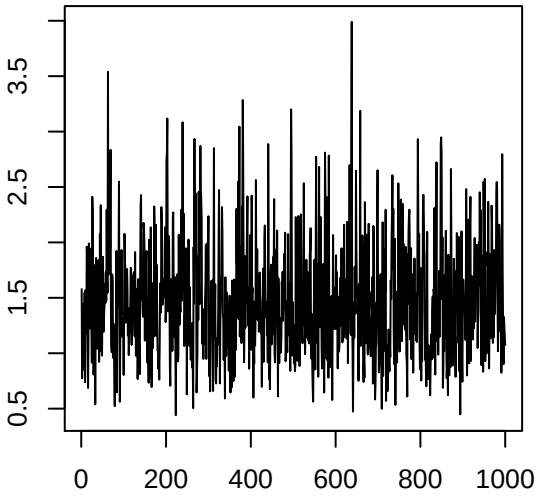
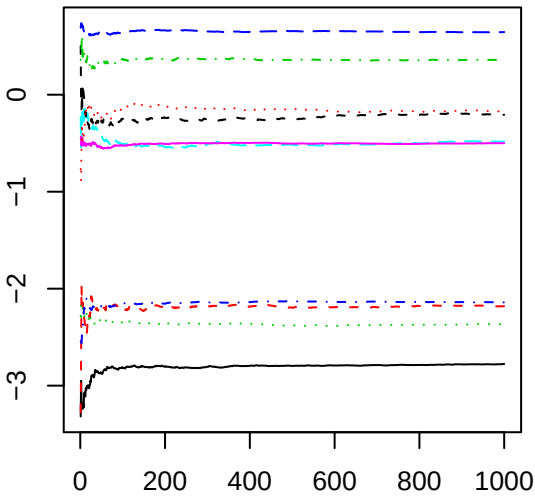
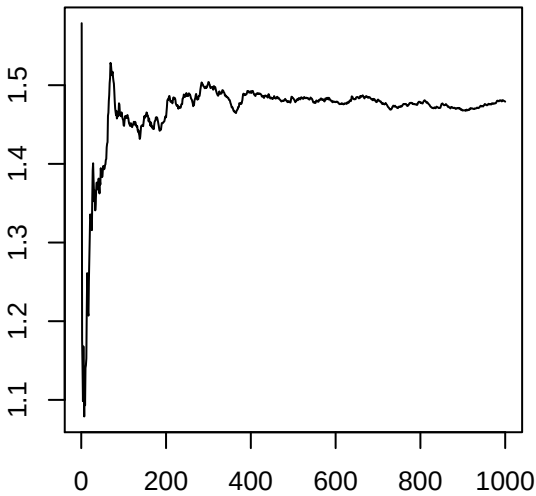
```
> # enter data
> y<-c(5,1,5,14,3,19,1,1,4,22)
> t<-c(94.3,15.7,62.9,126,5.24,31.4,1.05,1.05,2.1,10.5)
>
> # set fixed parameters and initialise others
> alpha<-1
> gamma<-delta<-1
> theta<-y/t
> beta<-alpha/mean(theta)
>
> # Gibbs sampling - a few trial updates
> for(i in 1:20)
+ {
+ theta<-rgamma(10,alpha+y,beta+t)
+ beta<-rgamma(1,gamma+10*alpha,delta+sum(theta))
+ }
>
> # a 'production' run, saving results
> nsweep<-1000
> theta_ts<-matrix(0,10,nsweep)
> beta_ts<-rep(0,nsweep)
>
> for(i in 1:nsweep)
+ {
+ theta<-rgamma(10,alpha+y,beta+t)
+ beta<-rgamma(1,gamma+10*alpha,delta+sum(theta))
+ theta_ts[,i]<-theta
+ beta_ts[i]<-beta
+ }
>
> # estimate posterior means
> apply(theta_ts,1,mean)
 [1] 0.06231097 0.11295048 0.09373830 0.11747165 0.61643587 0.60656781
 [7] 0.81312021 0.84154445 1.43470709 1.90805861
> mean(beta_ts)
[1] 1.479073
>
> # plot boxplots and superimpose data
> boxplot(theta_ts~row(theta_ts))
> points(1:10,y/t,col='red',pch='+')
>
> at<-matrix(0,10,1000)
> for(i in 1:10) at[i,]<-cumsum(theta_ts[i,])/(1:1000)
>
> # plot time series traces
> par(mfrow=c(2,2),mar=c(2,2,2,1))
> matplot(log(t(theta_ts)),type='l')
> plot(beta_ts,type='l')
> matplot(log(t(at)),type='l')
> plot(cumsum(beta_ts)/(1:1000),type='l')
>
> # plot posterior density estimates
> par(mfrow=c(3,4),mar=c(3,3,2,2))
> for(i in 1:10) plot(density(theta_ts[i,]),main=paste('theta',i),xlab='',ylab='')
> plot(density(beta_ts),main='beta',xlab='',ylab='')
>
```

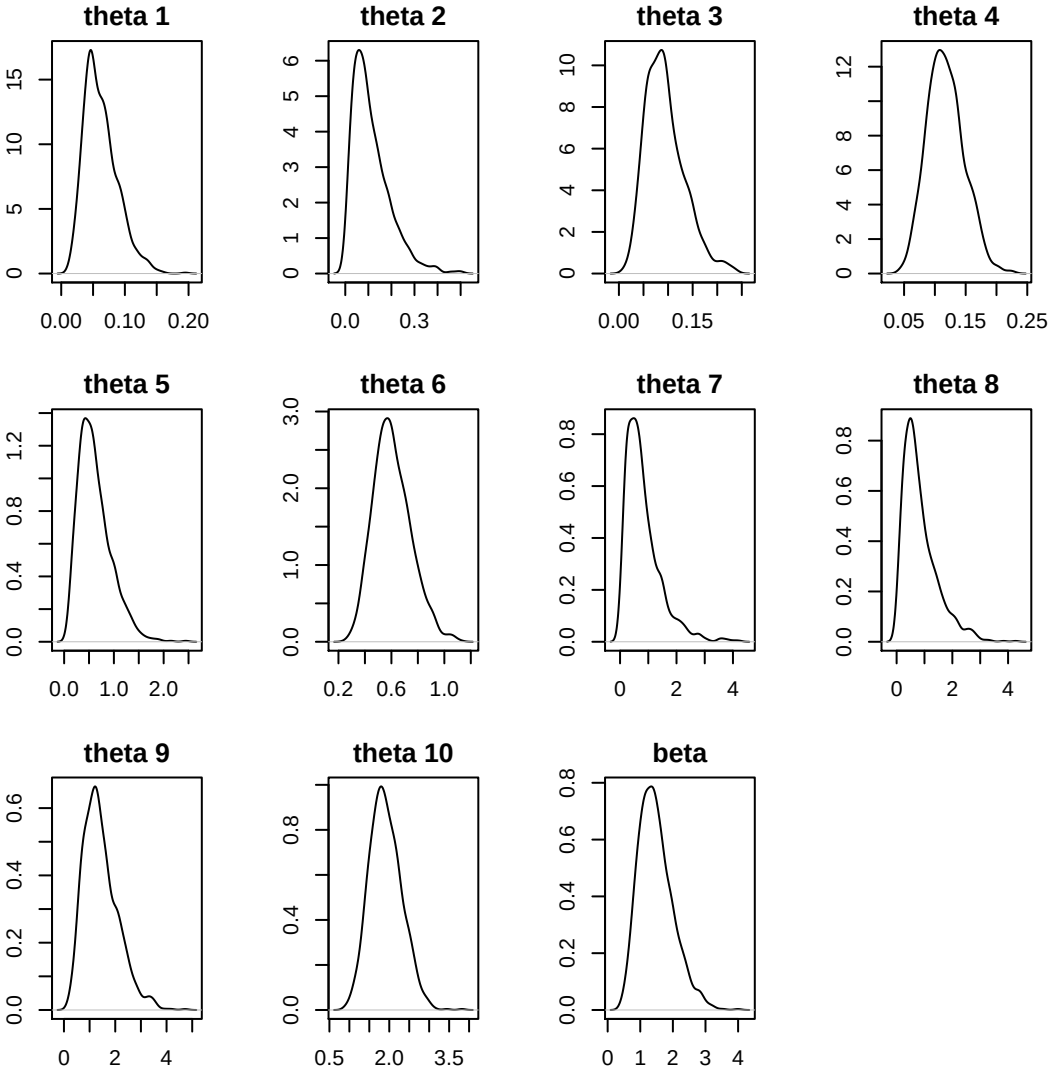

0
1
2
3
4
1
2
3
4
5
6
7
8
9
10


0
−2
−4
−6
0
200
400
600
800
1000


3.5
2.5
1.5
0.5
0
200
400
600
800
1000


0
−1
−2
−3
0
200
400
600
800
1000


1.5
1.4
1.3
1.2
1.1
0
200
400
600
800
1000


theta 1
theta 2
theta 3
theta 4
theta 5
theta 6
theta 7
theta 8
theta 9
theta 10
beta