Week8 (MCMC Diagnostics/ Bayesian Linear Regression)

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Metropolis algorithm for conjugate normal model with a known variance

Setup

```
s2<-1
t2<-10 ; mu<-5

set.seed(1)
n<-5
y<-round(rnorm(n,t2,s2),2)

mu.n<-( mean(y)*n/s2 + mu/t2 )/( n/s2+1/t2)
t2.n<-1/(n/s2+1/t2)

y
```

```
## [1]  9.37 10.18  9.16 11.60 10.33
```

```
mu.n
```

```
## [1] 10.02745
```

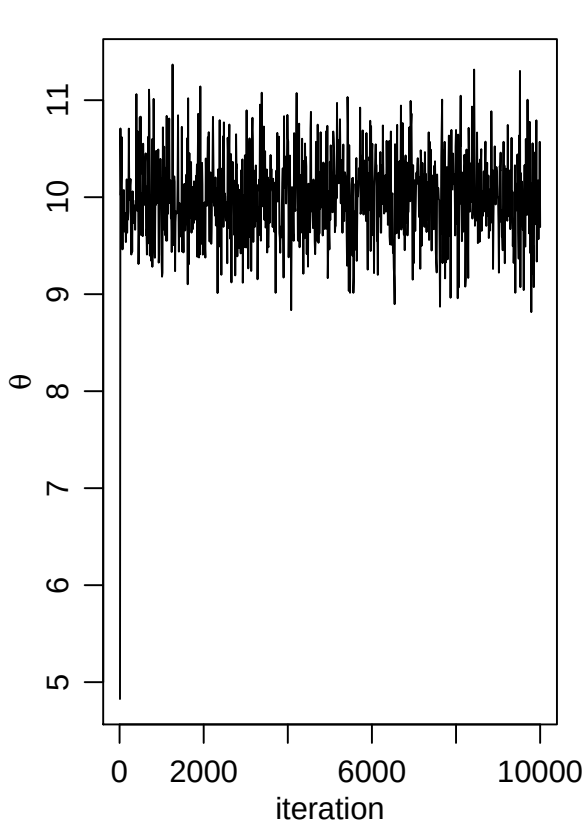
```
t2.n
```

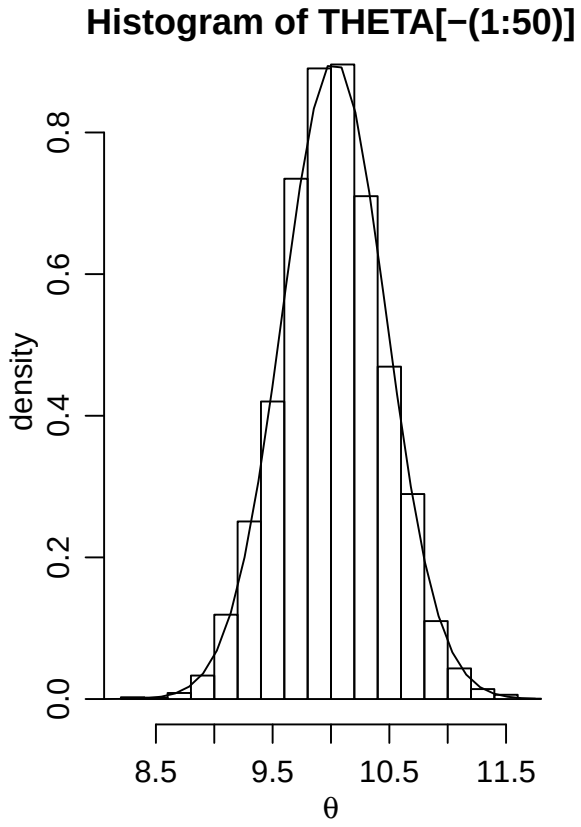
```
## [1] 0.1960784
```

MCMC

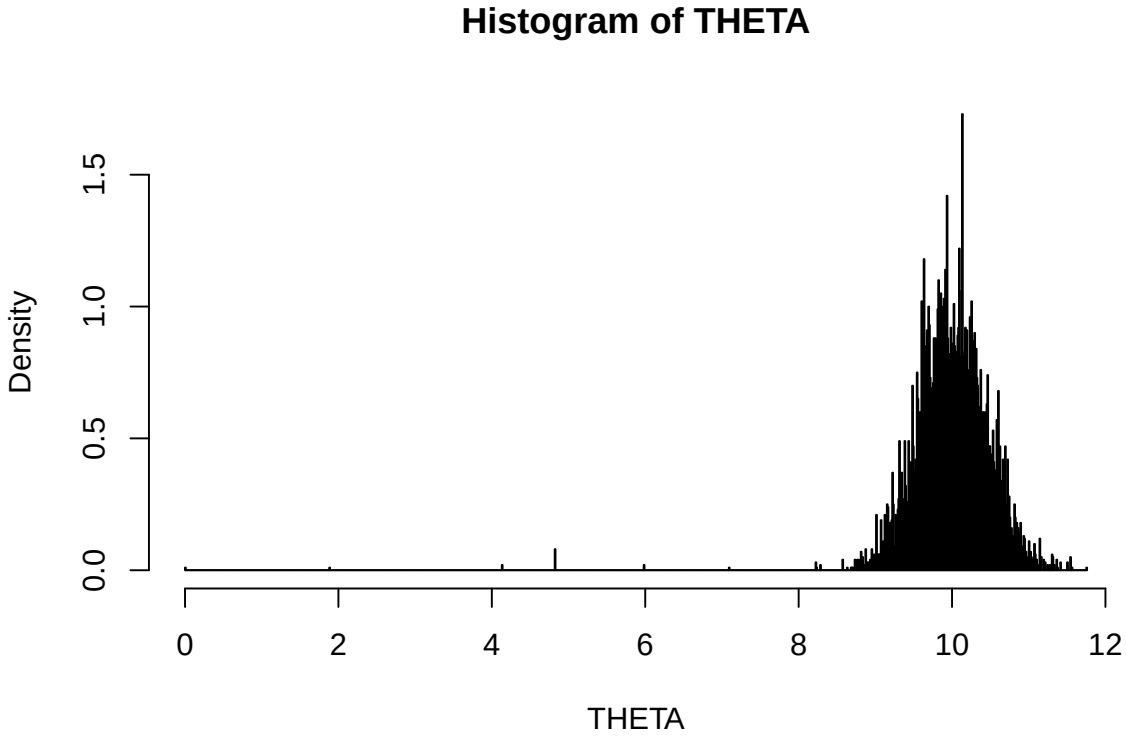
Results from the Metropolis algorithm for the normal model

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

skeep<-seq(10,S,by=10)
plot(skeep,THETA[skeep],type="l",xlab="iteration",ylab=expression(theta))

hist(THETA[-(1:50)],prob=TRUE,xlab=expression(theta),ylab="density")
th<-seq(min(THETA),max(THETA),length=100)
lines(th,dnorm(th,mu.n,sqrt(t2.n)) )
```






```
hist(THETA,breaks=1000,prob=TRUE)
```



```r
acf(THETA,main="Series THETA")
```