STA 243 Assignment 4

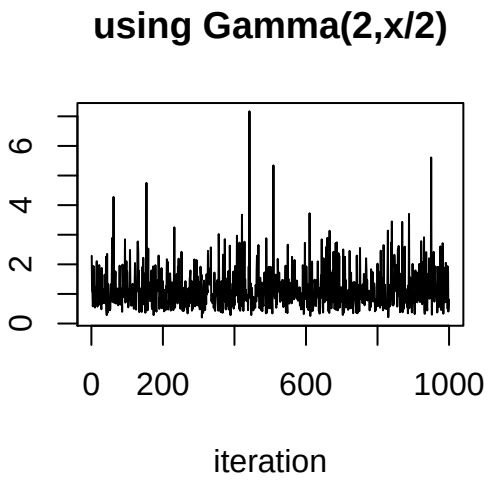
6.

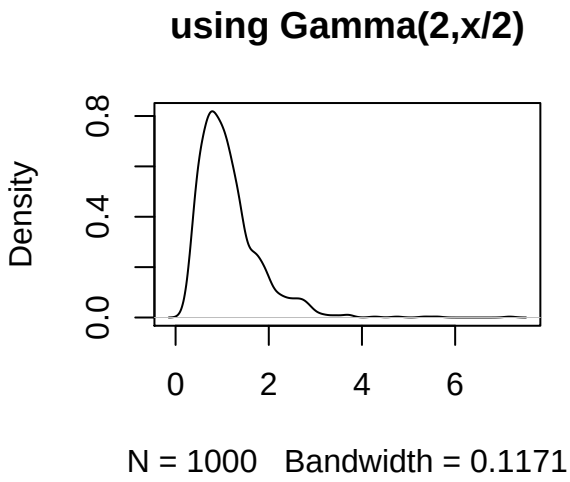
$Gamma(k, \theta)$ has mean $k\theta$

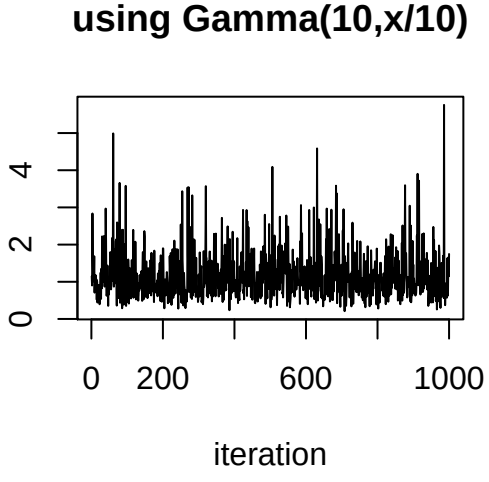
we can draw y_i from $Gamma(k, x_{i-1}/k)$ or $Gamma(x_{i-1}/\theta, \theta)$

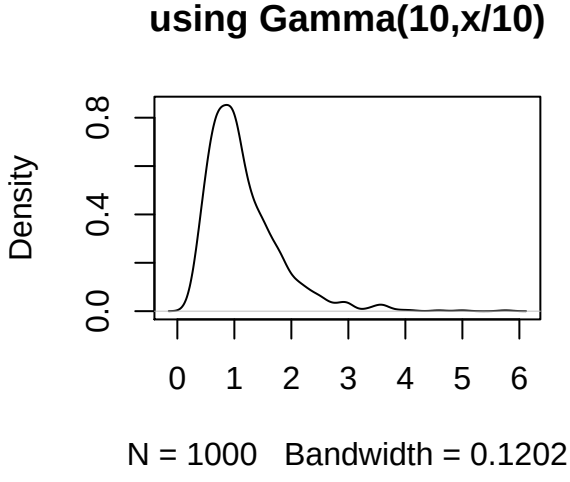
generate y_i from $q(y|x_{i-1})$ which is $gamma(k, x_{i-1}/k))$ or $gamma(x_{i-1}/\theta, \theta))$

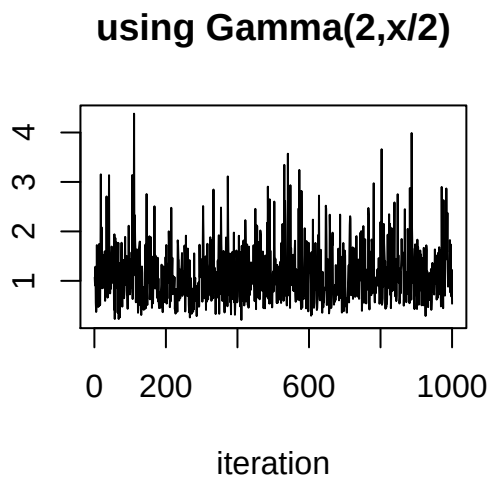
here is some plot of our output.

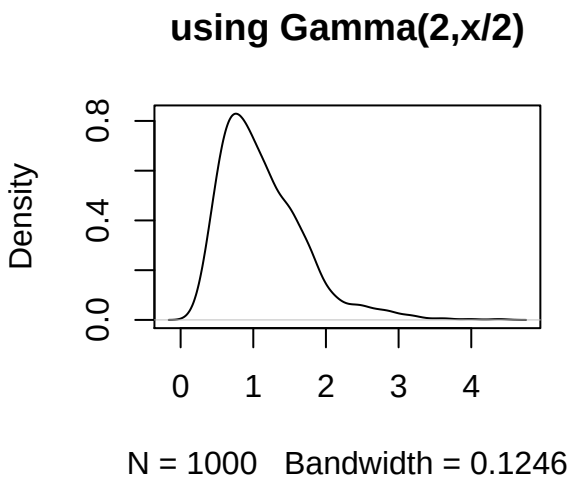


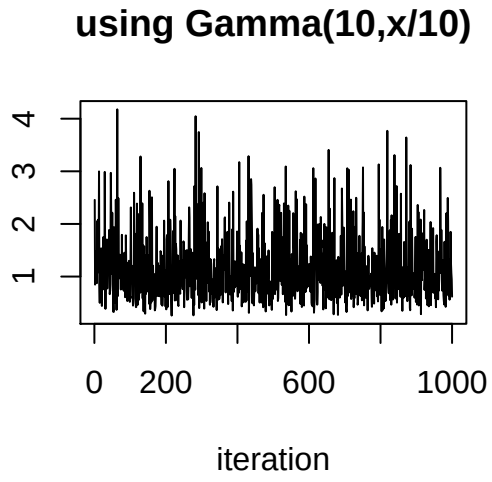


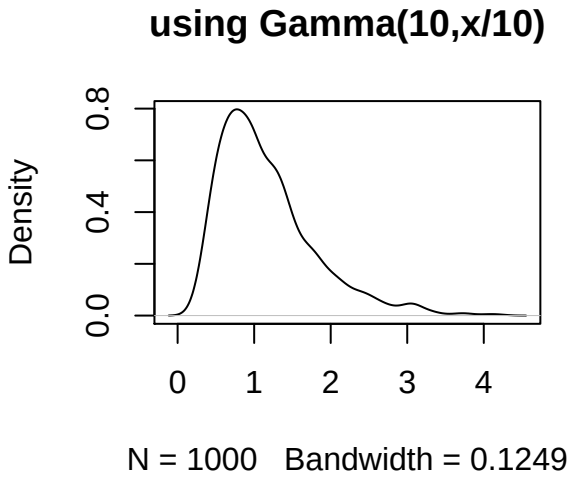












Here is the table showing the mean of the sampele and the mean of 1/sample

```
##                sample.mean X1.sample.mean
## True value        1.154701       1.116025
## Gamma(2,x/2)      1.146745       1.152220
## Gamma(10,x/10)    1.153957       1.127742
## Gamma(x/2,2)      1.130115       1.132655
## Gamma(x/10,10)    1.163459       1.124961
```

they are similar enough with each other and it seems all of them provide reasonable estimates.