

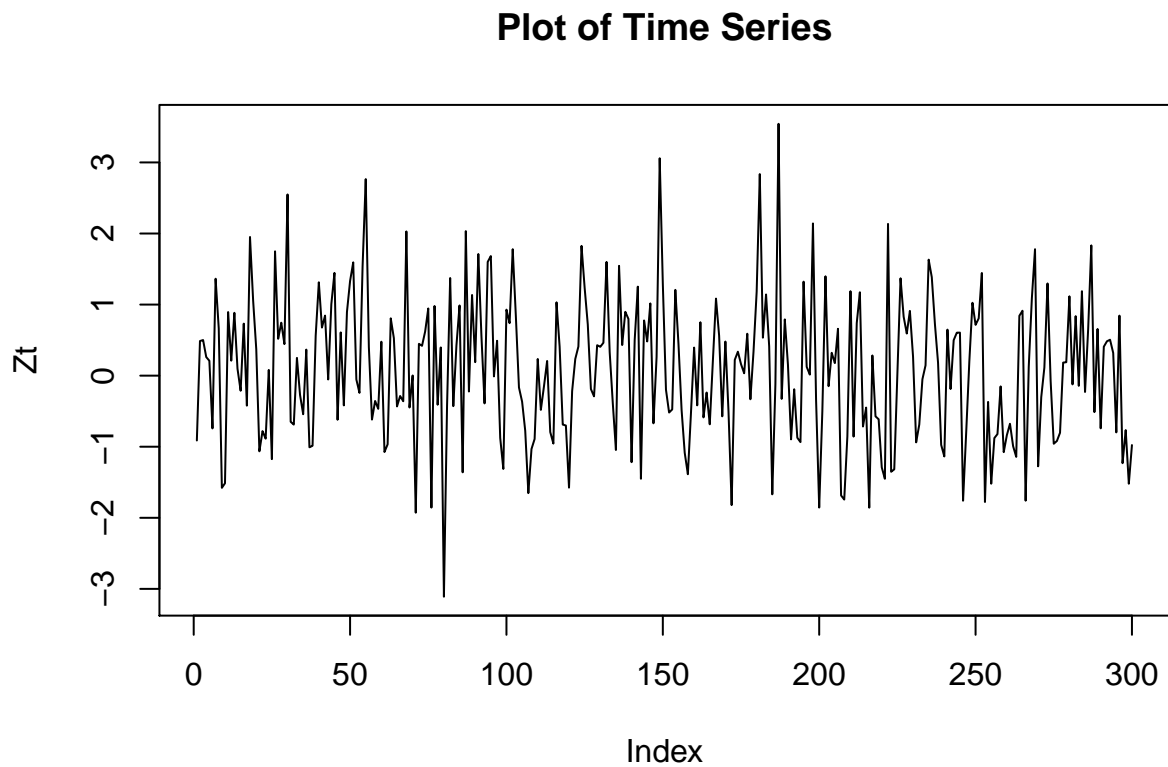
Questions 3, 4, and 5

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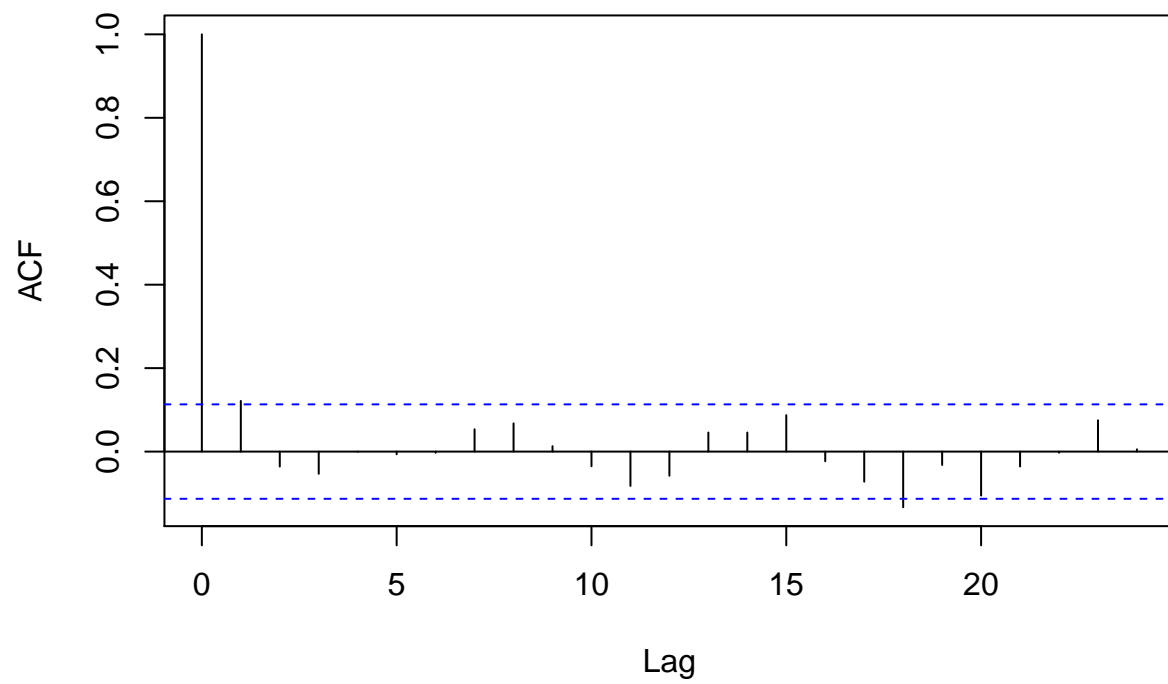
3a.

```
Zt=rnorm(300)
plot(Zt, main="Plot of Time Series", type='l')
```



```
Ztacf=acf(Zt,plot=F)
plot(Ztacf,main="Plot of Auto Covariance Function")
```

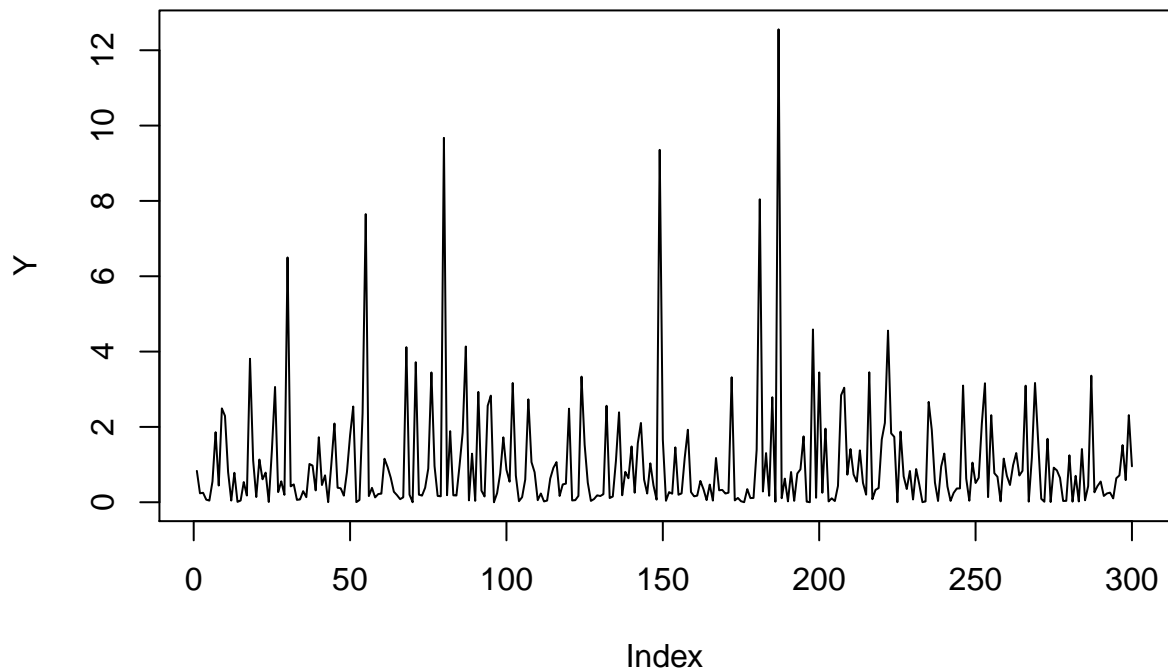
Plot of Auto Covariance Function



3b.

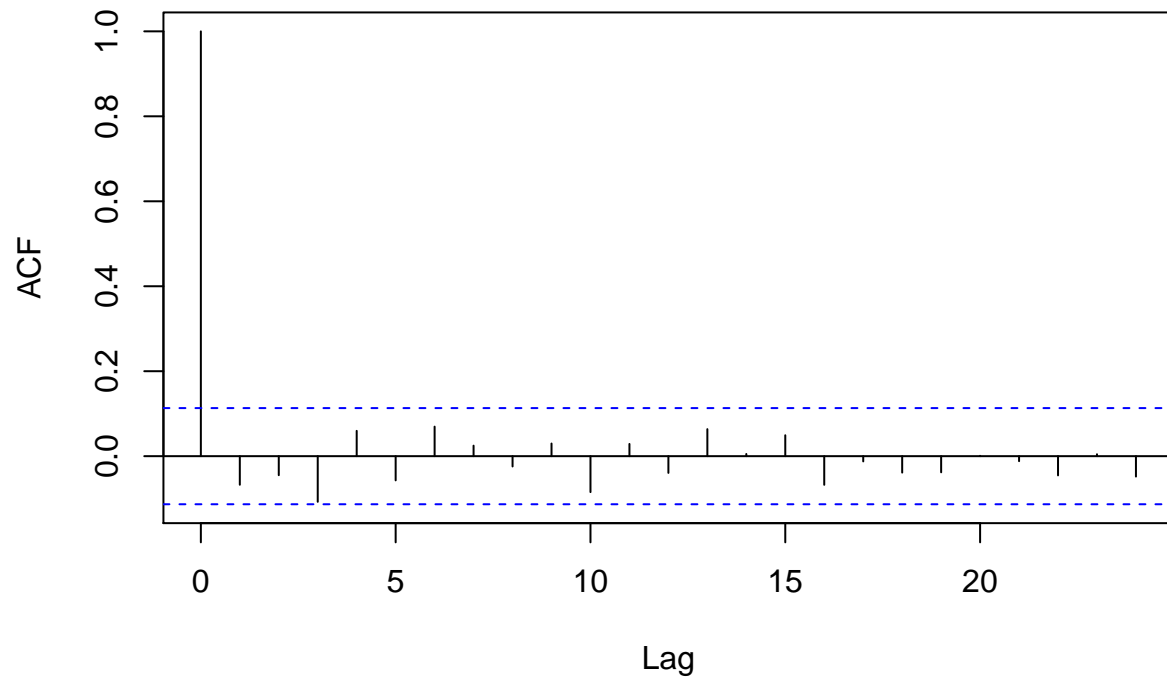
```
Y=Zt^2  
plot(Y, main="Plot of Time Series Y=Zt^2", type='l')
```

Plot of Time Series $Y=Zt^2$



```
Yacf=acf(Y,plot=F)
plot(Yacf,main="Plot of Auto Covariance Function  $Y=Zt^2$ ")
```

Plot of Auto Covariance Function $Y=Zt^2$



3c. The acf of Y and Z_t appear to be similar enough to be from a gaussian white noise function with both functions being stationary. However, one stark difference of the Y acf function is that the values appear to vary less implying that Y could very well come from a non-gaussian distribution.

4b.

```
matA=matrix(c(6,4,-2,1,-1,2,-2,1,-1),3,3,byrow=TRUE)
matA
```

```
##      [,1] [,2] [,3]
## [1,]    6    4   -2
## [2,]    1   -1    2
## [3,]   -2    1   -1
```

```
matB=matrix(c(2,-1,0),3,1)
matB
```

```
##      [,1]
## [1,]    2
## [2,]   -1
## [3,]    0
```

```
matAin=solve(matA)
matAin
```

```
##      [,1] [,2] [,3]
## [1,] 0.0625 -0.125 -0.375
## [2,] 0.1875  0.625  0.875
## [3,] 0.0625  0.875  0.625
```

```
matAin%*%matB
```

```
##      [,1]  
## [1,]  0.25  
## [2,] -0.25  
## [3,] -0.75
```

5.

```
polyroot(c(1,-2))
```

```
## [1] 0.5+0i
```

```
polyroot(c(1,-.45,.05))
```

```
## [1] 4+0i 5-0i
```