pstat274-lab02-aoxu

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Problem 1:

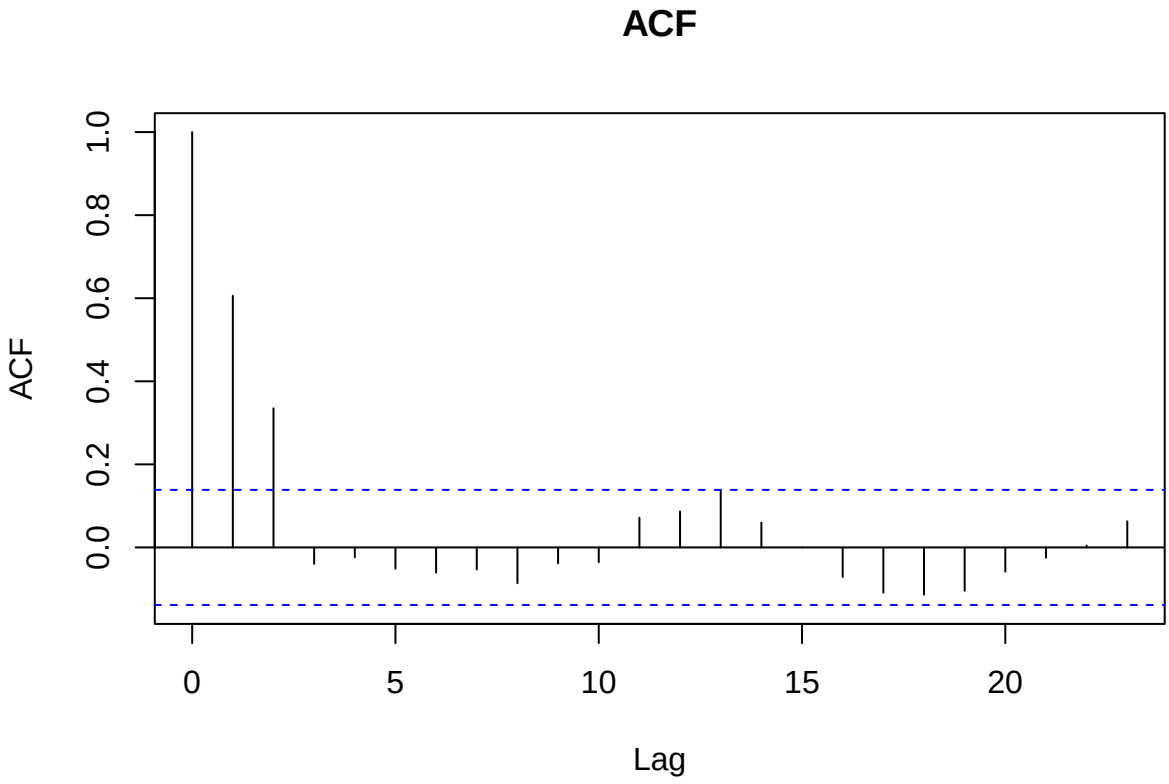
A white noise process is a random process of random variables that are uncorrelated, have mean zero, and a finite variance.

No, it doesn't have to be Gaussian.

Problem 2:

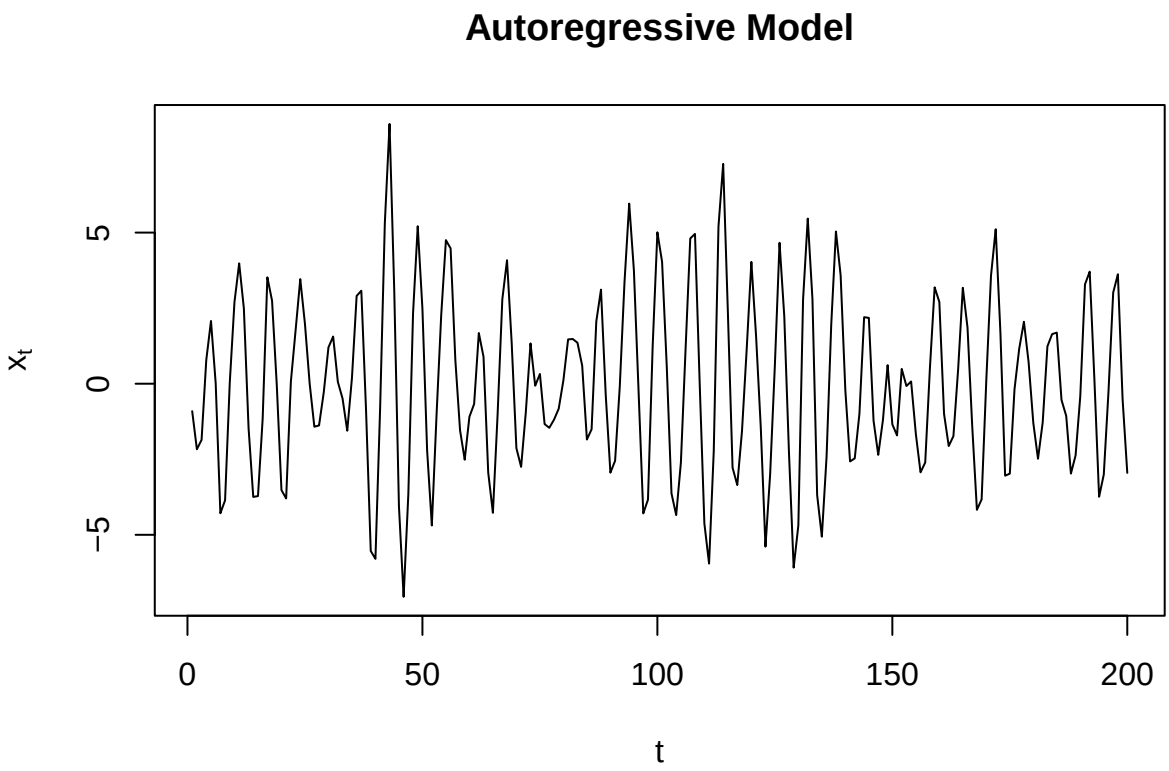
Yes, there is a difference that variability of Moving Avg is smaller than WN. It suggests that Moving Average as a data processing technique can reduce the effect of random variation and help to determine the underlying trend.

```
z_t <- rnorm(200,0,1)
y_t = filter(z_t, filter = rep(1/3,3), sides = 2, method = "convolution")
acf(y_t, na.action = na.pass, main="ACF")
```

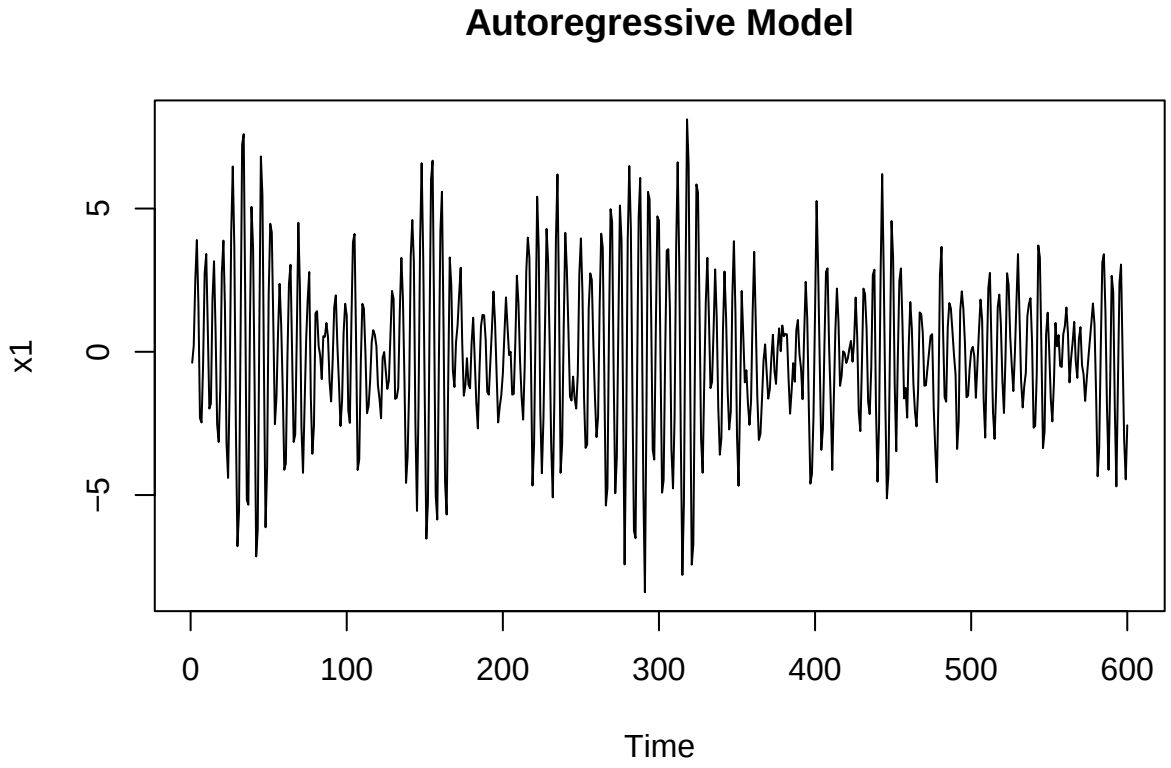


Problem 3:

```
x_t <- filter(z_t,filter = c(1,-0.9),method = "recursive")
plot(x_t,xlab = "t",ylab = expression(x[t]),type = "l", main = "Autoregressive Model")
```




```
x1 = arima.sim(n = 600, model = list(ar=c(1,-0.9)))
plot.ts(x1, main="Autoregressive Model")
```


Autoregressive Model
x1
5
0
−5
0
100
200
300
400
500
600
Time