

# HWA1

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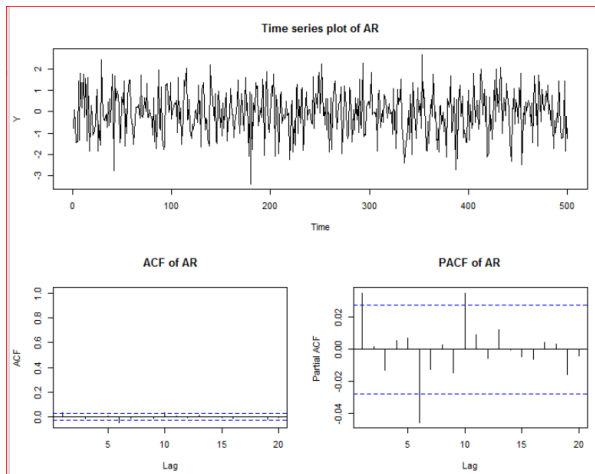
```
# Set parameters
phi_1      = 0 # AR(1) parameter
phi_2      = 0 # AR(2) parameter
sigma2     = 1  # variance of noise term
NumObsSim  = 5000 # Simulated Sample size
numObsToPlot = 500
ACFLagstoPlot = 20
sigma2     = 1  # variance of noise term
```

```
# Set seed for random number generation
set.seed(960231)

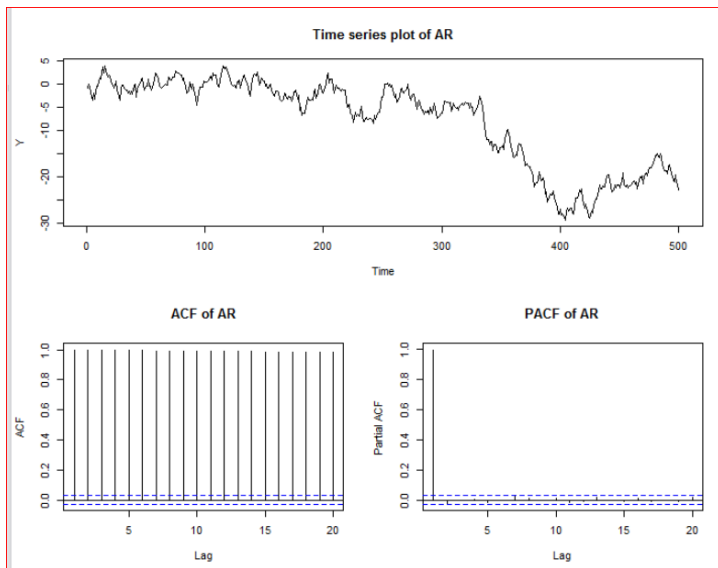
# initiate series. Let the first two elements of y_AR be innovations
y_AR <- c(rnorm(1)*sqrt(sigma2), rnorm(1)*sqrt(sigma2), rep(0, NumObsSim-2))
e      <- rnorm(NumObsSim)*sqrt(sigma2) # residual
```

```
# Simulate/generate realization of AR
for(i in 3:NumObsSim){
  y_AR[i] <- phi_1*y_AR[i-1] + phi_2*y_AR[i-2] + e[i]
}
# should be stored as time series object, makes for easier plotting.
y_AR <- as.ts(y_AR)
```

```
# Set parameters
phi_1      = 0 # AR(1) parameter
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sigma2     = 1  # variance of noise term
NumObsSim  = 5000 # Simulated Sample size
numObsToPlot = 500
ACFLagstoPlot = 20
sigma2     = 1  # variance of noise term
```

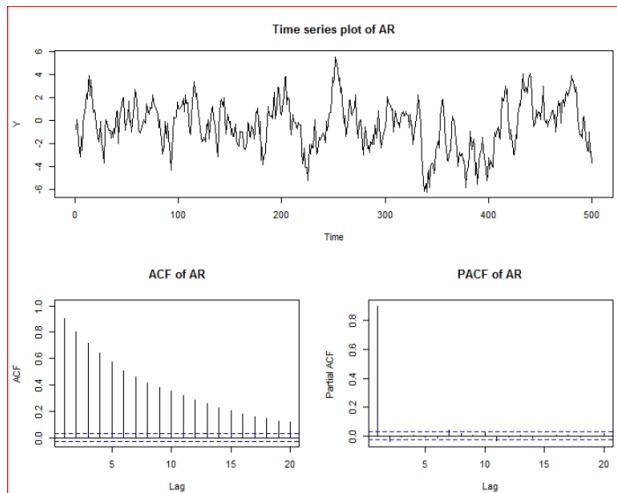


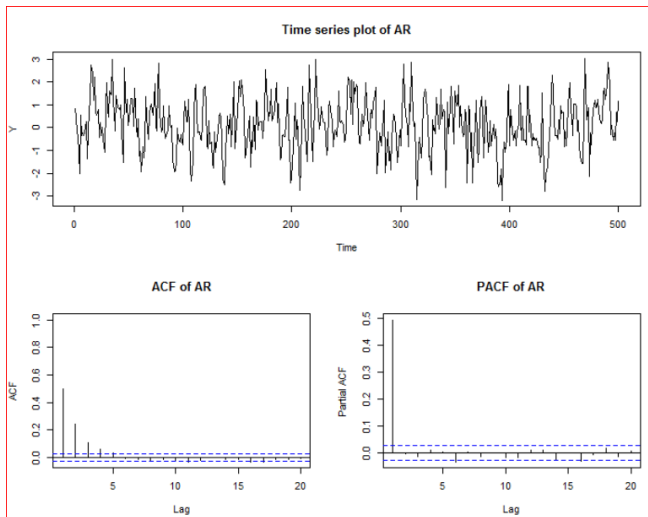
```
# Set parameters
phi_1      = 1 | # AR(1) parameter
phi_2      = 0 # AR(2) parameter
sigma2     = 1  # variance of noise term
NumObsSim  = 5000 # Simulated Sample size
numObsToPlot = 500
ACFLagstoPlot = 20
sigma2     = 1  # variance of noise term
```

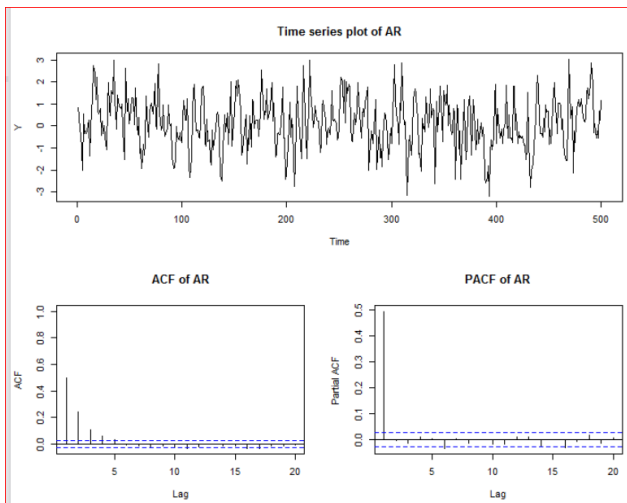




```
# Set parameters
phi_1      = 0.9 | # AR(1) parameter
phi_2      = 0   # AR(2) parameter
sigma2     = 1    # variance of noise term
NumObsSim  = 5000 # Simulated Sample size
numObsToPlot = 500
ACFLagstoPlot = 20
sigma2     = 1    # variance of noise term
```







```
# Set parameters
phi_1      = 0.4 | # AR(1) parameter
phi_2      = 0   # AR(2) parameter
sigma2     = 1    # variance of noise term
NumObsSim  = 5000 # Simulated Sample size
numObsToPlot = 500
ACFLagstoPlot = 20
sigma2     = 1    # variance of noise term
```

```
# Set parameters
phi_1      = -0.9 # AR(1) parameter
phi_2      = 0    # AR(2) parameter
sigma2     = 1     # variance of noise term
NumObsSim  = 5000  # Simulated Sample size
numObsToPlot = 500
ACFLagstoPlot = 20
sigma2     = 1     # variance of noise term
```

