> # Exercise 3

> # Simulate time series data and see that conventional tests may not work in the time series.

> # e.g. GDP growth, stock price, a firm's revenue.... Marketing

> rm(list=ls())

>

> set.seed(102)

> reject <- 0

>

> for (i in 1:1000) {

+ Sales<- rep(NA,100)

+ Online <- rep(NA,100)

+ e <- rep(NA,100)

+

+ Online[1] <- 2\*rnorm(1)

+ e[1] <- rnorm(1)

+ b0 <- 1

+ b1 <- 0

+ Sales[1] <- b0 + b1\*Online[1] + e[1]

+ rho1 <- 0.7

+ rho2 <- 0.7

+

+ for (t in 2:100) {

+ Online[t] <- rho1\*Online[t-1] + rnorm(1)

+ e[t] <- rho2\*e[t-1] + rnorm(1)

+ Sales[t] <- b0 + b1\*Online[t] + e[t]

+ }

+

+ linear.fit <- lm(Sales~Online)

+ summary(linear.fit)

+ confint(linear.fit)[2,]

+ confint(linear.fit)

+ if (confint(linear.fit)[2,1] > 0 | confint(linear.fit)[2,2] < 0) {

+ reject <- reject + 1

+ }

+ }

> reject

[1] 237

> reject/i

[1] 0.237