A1 Q3

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“‘{r} # Q3 library(astsa) library(fpp2)

split data in half

n = length(varve) first_half = varve[1:(n/2)] second_half = varve[(n/2 + 1):n]

calculate sample variances

var_first_half = var(first_half) var_second_half = var(second_half)

cat(“Variance of First Half:”, var_first_half) cat(“Variance of Second Half:”, var_second_half)

take log of series and plot

log_varve = log(varve)

autoplot(log_varve) + ggtitle(“Log Transformed Series”)

autocorrelation of log series

acf(log_varve)

take first differences and plot histogram and acf

z_t = diff(log_varve) autoplot(z_t) + ggtitle(“First Order Difference”)

hist(z_t) acf(z_t)

calculate autocovariance and autocorrelation for z_t

autocov_values = acf(z_t, type = “covariance”, plot = FALSE) autocor_values =acf(z_t, type = “correlation”, plot = FALSE)

get estimated values autocovariance with lag 0 and autocorrelation with lag 1

gamma_0 = autocov_values$acf[1] $gamma_1 = autocov_values$acf[2]

rho_1 = autocor_values$acf[2]

print(gamma_0) print(rho_1) “‘