Analisis Deret Waktu

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```r
# PLOT ACF (AUTOCORRELATION FUNCTION)

# Model MA(2): Y_t = e_t - 0.9 * e_{t-1} - 0.5 * e_{t-2}

dev.new()
par(mfrow = c(1, 2))

# PLOT KIRI (ACF Teoretis)
acf_teori_vector <- ARMAacf(ma = c(-0.9, -0.5), lag.max = 10)
lags <- 1:10
nilai_acf <- acf_teori_vector[2:(10 + 1)]
plot(lags, nilai_acf, type = "h",
     main = "ACF Teoretis MA(2)",
     xlab = "Lag", ylab = "ACF",
     ylim = c(-1, 1),
     lwd = 3, col = "red",
     xaxt = "n")
axis(1, at = seq(1, 10, by = 1))
abline(h = 0)

# PLOT KANAN (ACF Sampel)
set.seed(123)
data_sim <- arima.sim(model = list(ma = c(-0.9, -0.5)), n = 500)
acf_sampel_obj <- acf(data_sim, lag.max = 10, plot = FALSE)
plot(acf_sampel_obj$lag[-1], acf_sampel_obj$acf[-1], type = "h",
     main = "ACF Sampel MA(2)",
     xlab = "Lag", ylab = "ACF",
     ylim = c(-1, 1),
     lwd = 2,
     xaxt = "n")
axis(1, at = seq(1, 10, by = 1))
abline(h = 0)

n <- 500
batas_signifikan <- 1.96 / sqrt(n)
abline(h = c(batas_signifikan, -batas_signifikan), lty = 2, col = "blue")

par(mfrow = c(1, 1))


# PLOT PACF (PARTIAL AUTOCORRELATION FUNCTION)

dev.new()
par(mfrow = c(1, 2))
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```r
# PLOT KIRI (PACF Teoretis)
pacf_teori <- ARMAacf(ma = c(-0.9, -0.5), lag.max = 10, pacf = TRUE)
plot(pacf_teori, type = "h",
     main = "PACF Teoretis MA(2)",
     xlab = "Lag", ylab = "PACF",
     ylim = c(-1, 1),
     lwd = 3, col = "red")
abline(h = 0)

# PLOT KANAN (PACF Sampel)
set.seed(123)
data_sim <- arima.sim(model = list(ma = c(-0.9, -0.5)), n = 500)
pacf(data_sim, main = "PACF Sampel MA(2)", lag.max = 10)

par(mfrow = c(1, 1))
```