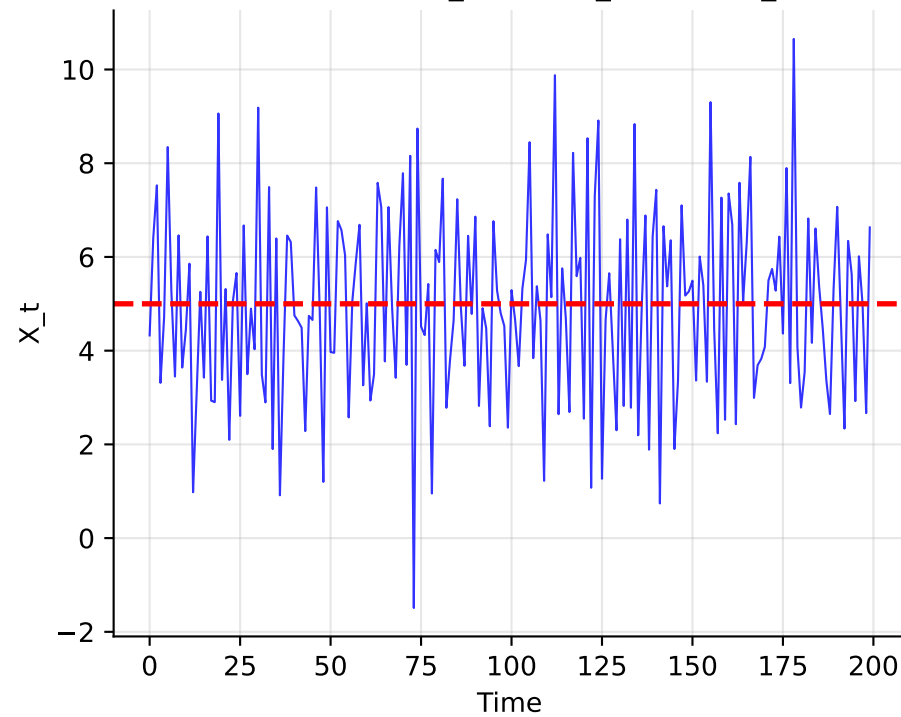
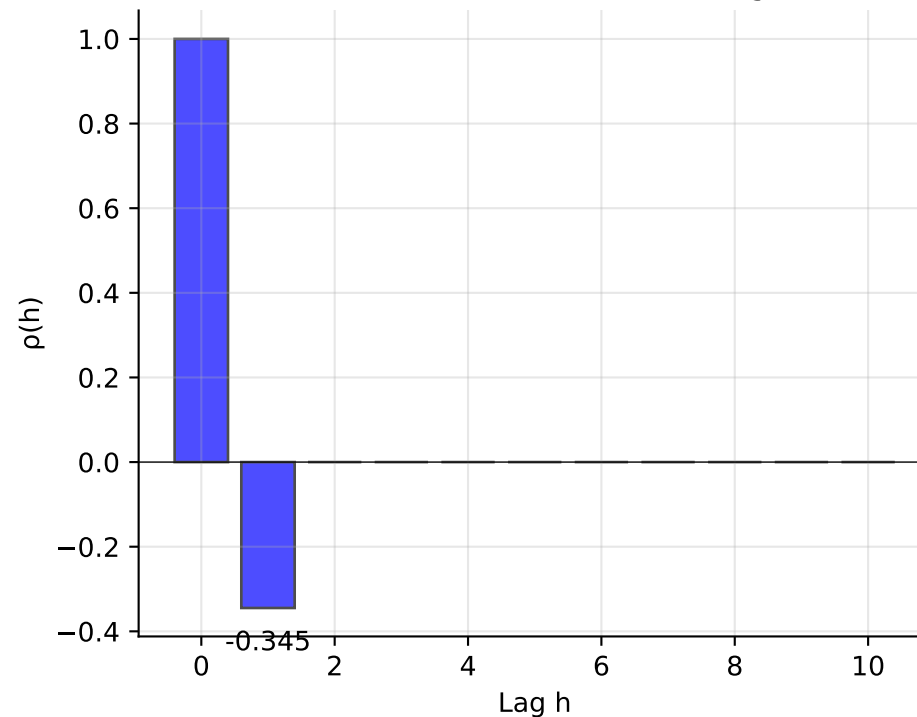


Simulated MA(1): $X_t = 5 + \varepsilon_t + (-0.4)\varepsilon_{t-1}$



-- Mean = 5

Theoretical ACF: Cuts off after lag 1



MA(1) Solution Summary

Model: $X_t = 5 + \varepsilon_t + (-0.4)\varepsilon_{t-1}$
 $\varepsilon_t \sim \text{WN}(0, 4)$

Results:

- Mean:
 $E[X_t] = 5$
- Variance:
 $\gamma(0) = \sigma^2(1+\theta^2) = 4 \times 1.16$
 $= 4.64$
- Autocovariance at lag 1:
 $\gamma(1) = \theta\sigma^2 = -0.4 \times 4$
 $= -1.6$
- Autocorrelation:
 $\rho(1) = \theta/(1+\theta^2) = -0.3448$
 $\rho(h) = 0$ for $h > 1$
- Invertibility:
 $|\theta| = 0.4 < 1$
 \rightarrow INVERTIBLE ✓