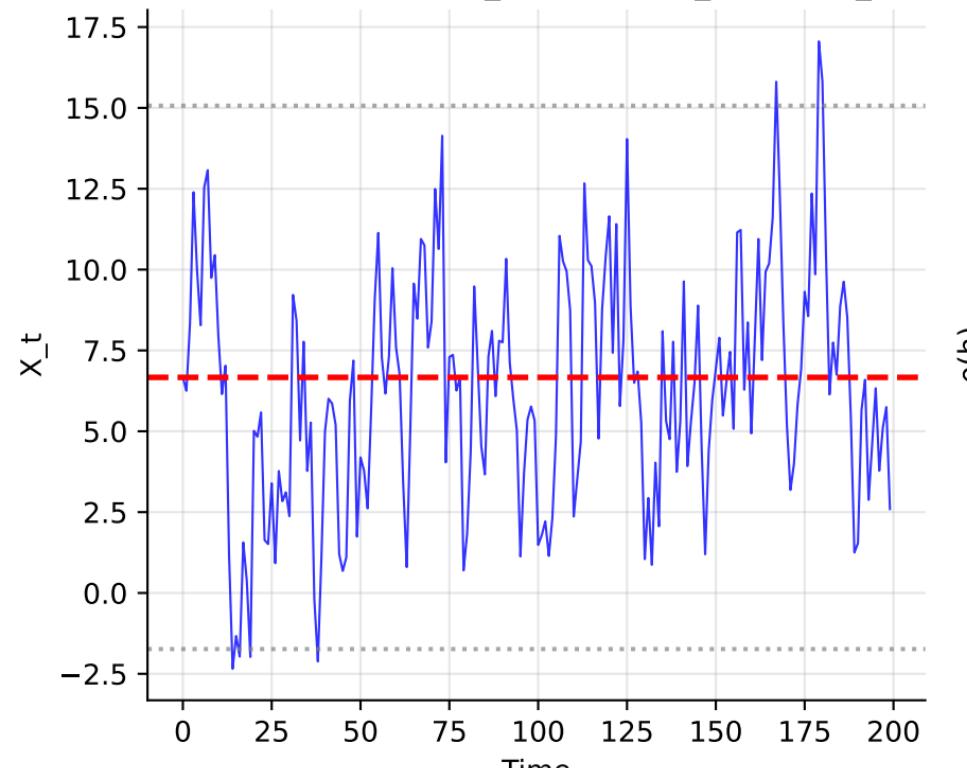
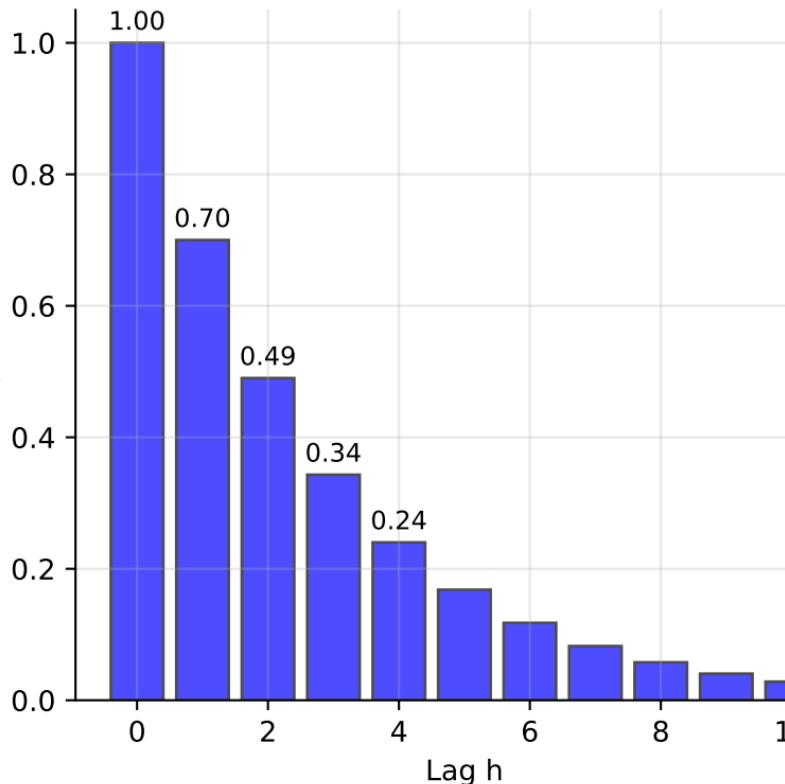


Simulated AR(1):  $X_t = 2 + 0.7X_{t-1} + \varepsilon_t$



— Mean  $\mu = 6.67$   
...  $\pm 2\sigma$

Theoretical ACF:  $\rho(h) = \varphi^h = 0.7^h$



## AR(1) Solution Summary

Model:  $X_t = 2 + 0.7X_{t-1} + \varepsilon_t$   
 $\varepsilon_t \sim WN(0, 9)$

Results:

1. Mean:  
 $\mu = c/(1-\varphi) = 2/(1-0.7) = 6.6667$

2. Variance:  
 $\gamma(0) = \sigma^2/(1-\varphi^2) = 9/0.5100$   
 $= 17.6471$

3. Autocovariance:  
 $\gamma(1) = \varphi \times \gamma(0) = 0.7 \times 17.65$   
 $= 12.3529$   
 $\gamma(2) = \varphi^2 \times \gamma(0) = 0.4899999999999994 \times 17.65$   
 $= 8.6471$

4. Autocorrelation:  
 $\rho(1) = \varphi = 0.7$   
 $\rho(2) = \varphi^2 = 0.4899999999999994$