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Statistics 248 - Homework 3

Let $\cdots, \varepsilon(-2), \varepsilon(-1), \varepsilon(0), \varepsilon(1), \varepsilon(2), \cdots$ be a sequence of independent identically distributed random variables with mean 0 and variance σ^2, (*white noise*). Consider the *random walk process*

$$Y(t) = \sum_{s=0}^{t} \varepsilon(s), \qquad t \geq 0$$

a) What is the mean level, $E\{Y(t)\}$, of the series? Is there a trend?

b) What is the variance function $var\ \{Y(t)\}$?

c) What is the covariance, $cov\{Y(s), Y(t)\}$ for $s, t = 0,1,2,...$?