006 - Intro to time series and forecasting

Notation

Autocovariance function	ACVF	$\gamma(h) = Cov(X_{t+h}, X_t)$
Autocorrelation function	ACF	$\rho(h) = \frac{\gamma(h)}{\gamma(0)}$
Weak stationarity		• $\mu_X(t)$ independent of t • $\gamma_X(t+h, t)$ independent of t for each h.
Models with trends		$X_t = \underbrace{m_t}_{\text{slowly changing function = trend component}} + \underbrace{Y_t}_{\text{zero-mean}}$ → Estimated via LS
Models with seasonality (Harmonic Regression)		$X_t = \underbrace{s_t}_{} + Y_t$ $s_t = a_0 + \sum_{j=1}^{K} (a_j \cos(\lambda_j t) + b_j \sin(\lambda_j t))$ estimate parameters via LS

GENERAL APPROACH TO TIME SERIES MODELING

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Plot and check for existence of

(a) Trend
(b) Seasonal component

→ Remove to get stationary residuals

(c) Apparent sharp changes in behavior
(d) Outlying observations

Section 1.5
→ Da leggere, spiega come si fa