



Istanbul Technical University
Department of Civil Engineering
Hydraulics and Water Resources Engineering Graduate Program
Stochastic Modelling Techniques in Hydrology
Spring Semester

Assignment Four

1. Obtain a time series data and generate a new time series using Moving Average Methods from third order to seventh order.
2. Plot the time series using original data and the new generated time series by moving average techniques on the same figure, and comment on the characteristics of the uncertainty term by taking all the plots into consideration.
3. Calculate the mean and variance values of the generated time series data and compare these values with the mean and variance values of the original data.
4. Use 'Differencing Operation' to eliminate the 'Trend' and generate a new time series from the original data.
5. Generate a new time series using the modelling equation $x_i = \mu_x + \sigma_x \varepsilon_i$
Here, μ_x is the mean value; σ_x is the standard deviation and ε_i is the stochastic term (white error). Compute the mean and standard deviation values from the original data set. Generate an ε_i term for which the mean value is equal to zero and standard deviation is 1.