

Working Problems for BSE 5034 Stochastic Hydrology (2017)

WP-9 Stochastic time series modeling of stream flow series

1. Daily stream flow data (in cms) observed at the Xia-Yuan station during the 1964 – 2003 period can be found in Xia_Yuan_DailyFlow.csv.
 - (1) In the same figure, plot daily flow series of individual years and the long-term average daily flow series.
 - (2) Repeat (1) by using the ten-day-period (TDP, 旬) flow series and monthly flow series.
2. Use daily flow data of 1964 – 1993 (30 years) to build an AR(k) model. In building the model, please conduct the following analyses:
 - (1) Use the *spec.pgram* function in R to identify periodic components embedded in the daily flow series.
 - (2) After removing the periodic components, build an AR(k) model for the residual series by using the *pacf* and *ARIMA* function in R.
3. Use the model built in Problem 2 to forecast the daily flow of Jan. 1 to Jan 31 of 1994.
 - (1) By the realtime forecasting method
 - (2) By the batch forecasting method