This study was conducted by using autoregressive (AR) modeling and data-driven techniques which include gene expression programming (GEP), radial basis function network (RBFN) and feed forward neural networks (FFNN) and adaptive neural-based fuzzy inference system (ANFIS) techniques to forecast monthly mean flow for Kızılirmak River in Turkey. The lagged monthly river flow measurements from 1955 to 1995 were taken into consideration for development of the models. The correlation coefficient and root mean square error performance criteria were used for evaluating the accuracy of the developed models. When the results of developed models were compared with flow measurements using these criteria, it was shown that the AR(2) model gave the best performance among all developed models and the GEP and ANFIS models had good performance in data driven techniques.