Chapter 6

Conclusion and Ideas for Future Work

In this research work we found that the generalized logistic distribution can also be used as a model for extremes in addition to the existing models of extremes described in Chapter 1. We have shown in Chapter 3 that the maximum $M_N$ of a random number $N$ of random variables, where $N$ is a geometric random variable, follows asymptotically the generalized logistic distribution. We saw that the generalized logistic distribution has a stability property in terms of random sample size $N$. Like the generalized extreme value model described in Chapter 1, the generalized logistic distribution also includes three well known families of distributions namely, the logistic, the loglogistic and the backward loglogistic distributions. We also verified that the generalized logistic model is a good fit for the Bombay stock exchange data. We introduced a goodness of fit measure in Chapter 5 and empirically verified that this has more power compared to other existing goodness of fit measures.
In Chapter 3, to prove that the generalized logistic distribution is the asymptotic distribution of the random maximum $M_N$, we used the main theorem of Chapter 2. The main theorem of Chapter 2 is proved for those function '$g$' which satisfies a property called $Q$ property. There may be bigger class of functions where the main theorem in Chapter 2 holds. One of the immediate interest is to identify such class of functions. The main theorem in Chapter 2 is also proved under the assumption that the general function $g$ has an asymptotic distribution. The condition under which such an assumption holds can be investigated. This is another problem of interest. Another aspect regarding the convergence results in Chapters 2 and 3 to be looked into is the rate of convergence. All the results in Chapters 2 and 3 are under the assumption that the sequences of random variables under consideration are independent and identically distributed. One can try to relax this assumption and look for convergence. This may lead to investigating whether the results in Chapters 2 and 3 hold for independent non identically distributed random variables and dependent sequences of random variables like stationary sequences.