**E1 243**

**Birth, death and catastrophe process**

Recently there have been some studies of the birth and death process modified to allow large random decrements which occur at a rate proportional to the population size. The decrement component is regarded as modeling "catastrophes" due either to large scale mortality or emigration. Brockwell [1982] derived the distribution of the time to extinction in the case of three specific decrement distributions and later Buhler [1989] and Nan Fu Peng [1983] further developed for the random sequence of catastrophes.

This paper is a sequel to Brockwell. Here, we consider a discrete state Markov model for growth of population subject to catastrophe. In this model catastrophe rate and the birth rate are population dependent. We also assume that catastrophe reduces population size by a uniformly distributed random amount.

We have studied the problem of the population extinction for a model where the reduction of the population occur due to occurrence of catastrophe and obtained the results of the distribution of the time to extinction. Various extensions, to the model studied are possible. Some of these are,

We have studied the problem of the population extinction for a model where the reduction of the population occur due to occurrence of catastrophe and obtained the results of the distribution of the time to extinction. Various extensions, to the model studied are possible. Some of these are,

1. to obtain similar results for Binomial and Geometric Catastrophes,
2. this results can be extended for a model with frequently occurring catastrophes,

Another possible direction is to try and generalize the results of this paper to continuous state space models which have state dependent catastrophe rates.