

# Stochastic processes

- Introduction - Stochastic processes
- The Binomial Process
  - Introduction - The binomial process
  - Distribution of the number of successes  $s$  in  $n$  trials, each with probability  $p$
  - Distribution of the number of trials  $n$  needed to obtain  $s$  successes, each with probability  $p$
  - Estimation of the probability  $p$  after having observed  $s$  successes in  $n$  trials
  - Estimation of the number of trials  $n$  made after having observed  $s$  successes with probability  $p$
  - An example of using the estimate of binomial probabilities in risk analysis
- The Poisson process
  - Introduction - The Poisson Process
  - Deriving the Poisson distribution from the Binomial
  - Time to wait to observe  $\alpha$  events
  - Estimate of the mean number of events per period,  $\lambda$
  - Estimate of the elapsed period  $t$
  - An example of using the estimate of Poisson rates in risk analysis
  - Some Poisson models
- Hypergeometric process
  - Introduction - The Hypergeometric Process
  - Number of samples that were taken to have observed a specific  $s$
  - Estimate of population and sub-population sizes
  - Number in a sample with a particular characteristic
  - Number of samples to get a specific  $s$
- Renewal processes
- Mixture processes
- Martingales
- Central Limit Theorem - CLT