Topics Covered in Lecture 5

7-August, 2002

- Bernouli Trials
  - Two outcomes on each trial. In general there may be multiple outcomes for each trial, this will be done with *generalized Bernouli trial.*
  - Successive trials are independent: Relaxing this assumption leads to *descrete time Markov Chains.*
  - Probability of success/failure on each trial is the same. Relaxing this assumption leads to *Nonhomogeneous Bernouli Trials.*
- The elementary event {s} can be written as

$$\{s\} = A_1 \cap A_2 \ldots \cap A_k \cap \bar{A}_{k+1} \cap \bar{A}_{k+2} \cap \ldots \cap \bar{A}_n$$

- $$\begin{aligned} P(s) &= P(A_1 \cap A_2 \ldots \cap A_k \cap \bar{A}_{k+1} \cap \bar{A}_{k+2} \cap \ldots \cap \bar{A}_n) \\ &= P(A_1)P(A_2) \ldots P(A_k)P(\bar{A}_{k+1})P(\bar{A}_{k+2}) \ldots P(\bar{A}_n)) \end{aligned}$$

  by independece therefore

$$P(s) = p^k q^{n-k}$$

- Probability of exact k successes out of n.
  $P(k) = \left(\begin{array}{c} n \\ k \end{array} \right) p^k q^{n-k}$
- Hamming code
- TMR
- DOSS example