Tutorial 8

Ch. 4 and 5 $\,$

Nov. 11

| Summary | of | the | discrete | distri | butions: |
|---------|----|-----|----------|--------|----------|
| | | | | | |

| X | X Counts | p(x) | Values of X | E(x) | V(x) |
|----------------------|---|---|---|---------------------|---|
| Binomial | Number of sucesses in n fixed trials | $\binom{n}{x}p^{x}(1-p)^{n-1}$ | ^{-x} x = 0,1,,n | np | np(1-p) |
| Poisson | Number of arrivals in a fixed time period | $\frac{e^{-\lambda}\lambda^{x}}{x!}$ | x = 0,1,2, | λ | λ |
| Geometric | Number of trials up through 1st success | (1-p) ^{x-1} p | x = 1,2,3, | 1 p | $\frac{1-p}{p^2}$ |
| Negative Binomial | Number of trials up through kth success | $\binom{x-1}{k-1}(1-p)^{x-k}$ | ^k p ^k x = k, k + 1, | k p | $\frac{k(1-p)}{p^2}$ |
| Hyper - geometric | Number of marked individuals in sample taken without replacement | $\frac{\binom{M}{x}\binom{N-M}{n-x}}{\binom{N}{n}}$ | max (0,M + n – N ≤ x ≤ min (M,n) |) n* <mark>M</mark> | <u>nM(N – M)(N – n)</u> N ² (N – 1) |

Chapter 4 Example 9c page 157

Find the expected value of the sum obtained when n fair dice are rolled.

Chapter 5 Problem 5.1 page 212

$$f(x) = \begin{cases} c(1-x^2) & -1 < x < 1 \\ 0 & otherwise \end{cases}$$

- a. What is the value of c?
- b. What is the cumulative distribution function?

Suggested Problem

Find the cumulative distribution function of the following density:

$$f(x) = \begin{cases} x & 0 < x < 1 \\ 1 & 1 \le x < 1.5 \\ 0 & otherwise \end{cases}$$