Lecture on July 3rd, 2018
Conditional Probability and Conditional Expectations II

1 Random Sums - See Chap 2.3

- Definition of random sum.
- Definition and properties of conditional distribution function and density function.
- Moments (mean and variance) of random sum.
- Distribution of random sum.
- Example: $\xi_i \sim Exp(\lambda)$, $N \sim Geo(\beta)$, then random sum $X \sim Exp(\lambda\beta)$.

2 Conditional Probability and Expectations (Continuous Case) - See Chap 2.4

- Definitions and properties of conditional probability density function, conditional distribution function, conditional expectation.
- Example: If $X, Y \sim f_{X,Y}(x,y) = \frac{1}{y}\exp^{-x/y-y}$ for $x, y > 0$, then $f_{X|Y}(x|y) = \frac{1}{y}\exp^{-x/y}$, for $x, y > 0$.