Lecture on July 1st, 2019
Conditional Probability and Conditional Expectations I

1 Conditional Probability (Discrete Case) - See Chap 2.1

- Definitions of conditional probabilities, conditional mass function.
- Conditional mass function is a probability mass function!
- Example: If $X \sim B(N, p)$, $N \sim B(M, q)$, then $X \sim B(M, pq)$.

2 Conditional Expectation (Discrete Case) - See Chap 2.1

- Definitions and important properties of conditional expectations.
- $\mathbb{E}[g(X)|Y = y]$ is a function of y, and $\mathbb{E}[g(X)|Y]$ is a random variable.

3 Random Sums - See Chap 2.3

- Definition of random sum.
- Definition and properties of conditional distribution function and density function.