

JOINT DISTRIBUTIONS

Evaluating probabilities given a joint pmf or a joint pdf

Obtaining the “marginal” distributions from a joint distribution

Calculating distribution of a random variable given as a function of other random variables

Assuming independence, obtaining joint pdf (pmf) from marginals

EXPECTATIONS

Evaluating the expectation, variance, covariance, or correlation coefficient given a (joint) pmf or a (joint) pdf

Evaluating the expectation of a random variable given as a function of another random variable or as a function of several random variables

Expectation of a product of independent random variables

Expectations and variances for linear combinations of random variables

Calculation of expectations using indicator random variables

CONDITIONAL DISTRIBUTIONS

Conditioning on the values of discrete and continuous random variables

Calculation of probabilities using conditioning

Conditional density given value of continuous random variable

SEQUENCES OF INDEPENDENT RANDOM VARIABLES

Random samples (repeated replications of an experiment)

Bernoulli trials: Relationship to binomial and geometric distributions

LIMIT THEOREMS

Law of large numbers

Relationship of law of large numbers to relative frequency interpretation of probability

Central limit theorem

Use of the central limit theorem to approximate probabilities involving sums of independent random variables (random samples)

Sample size problems