Stat 134: Section 17

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Conceptual Review

Please discuss these short questions with those around you in section. These problems are intended to highlight concepts that will be relevant for today's problems.

a. What is a joint distribution? Can you come up with examples where the joint distribution is jointly independent and dependent?

b. What is the joint density function and marginal density?

c. Describe the joint uniform distribution.

Problem 1

Let X, Y be independently distributed and uniform on $(0, 1)$. Find:

$$P(Y \geq \frac{1}{2} | Y \geq 1 - 2X).$$

Ex 5.1.3 in Pitman's Probability

Problem 2

For a striaght stick, we pick two points uniformly and independently. What is the probability that the three parts can form a triangle? *Ex 5.1.9 in Pitman's Probability*

Problem 3

Suppose X_1, X_2, X_3 are independent exponential distributions with $\lambda_1, \lambda_2, \lambda_3$. Find $P(X_1 < X_2 < X_3)$.
Ex 5.2.16 in Pitman's Probability