4. Indicator notation

Problem 3. Indicator notation

4.0/4.0 points (graded)

Let A, B, C be three events, and let $X = I_A$, $Y = I_B$, and $Z = I_C$ be the associated indicator random variables.

We already know that $X \cdot Y$ is the indicator random variable of the event $A \cap B$. In the same spirit, give an algebraic expression, involving X, Y and Z, for the indicator random variable of the following events.

Note: Express your answers in terms of X, Y, and Z (the answer box is case sensitive) using standard notation.

1. The event $A^c \cap B \cap C$.

(1-X)*Y*Z ✔ **Answer:** (1-X)*Y*Z

2. At most two of the events A, B, C occurred.

1-(X*Y*Z) ✔ **Answer:** 1-X*Y*Z

STANDARD NOTATION

Solution:

1. The indicator random variable for A^c is $1 - X$. Hence, the indicator random variable for the event, $A^c \cap B \cap C$ is $(1 - X)YZ$.

2. The event of interest is the complement of the event that all three events have occurred, and it is the same as

$$(A \cap B \cap C)^c,$$

Thus, the associated indicator random variable is,

$1 - XYZ.$

提交 You have used 1 of 2 attempts

Answers are displayed within the problem

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