STAT 3332 Statistics for Life Sciences

Fall 2007

Quiz 2

Your Name (Please **PRINT**):

Your *Signature*:

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1. The sample space of outcomes for tossing one coin and rolling one die is

   $S = \{$H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6$\}$.

The event $A = \{$die equals either 5 or 6$\}$ is given by

{H5, H6} {H5, T5} **{H5, H6, T5, T6}** {T5, T6}

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2. (Continuation) Let $B = \{$H1, H2, H3, H4, H5, H6$\}$ and $C = \{$H5, H6, T5, T6$\}$. Then the set {H5, H6} is

the *union* of B and C **the *intersection* of B and C** neither of these

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3. (Continuation) The *complement* of B is

$\overline{B} =$ **{T1, T2, T3, T4, T5, T6}**

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4. (Continuation) Let probability function P attach equal probability 1/12 to the 12 outcomes in S. Let $B = \{$H1, H2, H3, H4, H5, H6$\}$ and $C = \{$H5, H6, T5, T6$\}$. Then the conditional probability of B given C is

(A) $P(B \mid C) = \frac{P(B \cup C)}{P(C)} = \frac{8/12}{4/12} = 2$

(B) $P(B \mid C) = \frac{P(B \cap C)}{P(C)} = \frac{2/12}{4/12} = 1/2$

(C) $P(B \mid C) = P(B) \times P(C) = (6/12) \times (4/12) = 24/144 = 1/6$

(D) $P(B \mid C) = \frac{P(B)}{P(C)} = \frac{6/12}{4/12} = 3/2 = 1.5.$

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5. *Cardiovascular Disease.* For a population of persons, let

$A = \{$person exhibits chest pain$\}$

$B = \{$person is hypertensive$\}$.

Suppose it is known that for a randomly selected person

$P($person exhibits chest pain$) = P(A) = .051,$

$P($person is hypertensive$) = P(B) = .020,$

$P($person exhibits chest pain or is hypertensive or both$) = P(A \cup B) = .069.$

Then the probability that a randomly selected person both exhibits chest pain and is hypertensive is $P(A \cap B) =$

$.051 + .020 + .069 = .140$ $.051 \times .020 = .00102$ **$.051 + .020 - .069 = .002$**
