

STAT 3332 Statistics for Life Sciences

Fall 2006

Quiz 5

Your Name (Please **PRINT CLEARLY**):

Your *Signature*:

1. In studying relationships among random variables that are dependent on each other, we

- (A) use equations to describe relationships
 - (B) use correlation to measure strength of linearity in the relationship
 - * (C) use both of these approaches
 - (D) use neither of these approaches
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2. The linear regression model for the relation between X and Y is described by

- (A) $Y = \alpha + \beta X + \varepsilon$ with $E(\varepsilon) = 0$.
 - (B) $E(Y | X = x) = \alpha + \beta x$
 - * (C) both of these
 - (D) neither of these
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3. For a data set of bivariate observations $(X_1, Y_1), \dots, (X_n, Y_n)$, the line $\hat{\alpha} + \hat{\beta}x$ which minimizes $\sum_{i=1}^n [Y_i - (\hat{\alpha} + \hat{\beta}X_i)]^2$

- (A) is called the least squares line
 - (B) satisfies $\hat{\beta} = \frac{\sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})}{\sum_{i=1}^n (X_i - \bar{X})^2}$ and $\hat{\alpha} = \bar{Y} - \hat{\beta}\bar{X}$
 - * (C) both of these are true
 - (D) neither of these is true
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4. From a set of hematologic data for patients with aplastic anemia, a regression line relating number of lymphocytes (per mm²) (Y) to % reticulocytes (X) was fitted: $Y = 1894.8 + 112.1X$. Using this, the estimated average number of lymphocytes for patients with 3% reticulocytes is

- 1894.8
 - 112.1
 - 3×112.1
 - * $1894.8 + 3 \times 112.1$
 - $3 \times (1894.8 + 112.1)$
-

5. (Continuation) For subjects whose reticulocytes differ by 1%, what is the expected difference in their numbers of lymphocytes?

- 1894.8
 - * 112.1
 - 3×112.1
 - $1894.8 + 3 \times 112.1$
 - $3 \times (1894.8 + 112.1)$
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