

DM-Quiz-2020-Q2

41.18% (7/17)

- ✓ 1. Select the intercept-only models, if any:
- ☐ A $y=b_0+b_1*x$
 - ☐ B $y=b_0+b_1*x_1+b_2*x_2$
 - ☒ C $\ln(y)=b_0$
 - ☐ D $y=e^{(b_1*x)}$
 - ☐ E I do not know
- ✓ 2. The interpretation of adjusted R^2 for multiple linear regression is the same as the interpretation of R^2 for simple linear regression.
- ☐ A True
 - ☒ B False
 - ☐ C I do not know
- ✗ 3. Which one is observable ("visible")?
- ☐ A e (residuals)
 - ☒ B ε (regression error)
 - ☐ C neither
 - ☐ D I do not know
- ✗ 4. The estimation of β is distributed as:
- ☒ A $b \sim N(0, \sigma^2)$
 - ☐ B $b \sim N(\beta, \sigma^2)$
 - ☐ C $b \sim N(\beta, \sigma^2(X^T X)^{-1})$
 - ☐ D It does not have distribution
 - ☐ E I do not know

✗ 5. How many parameters are estimated by OLS in the case of simple linear regression?

- ☐ A 1
- ☒ B 2
- ☐ C 3
- ☐ D I do not know

✗ 6. Estimation of e (residuals) is distributed as:

- ☒ A $e \sim N(0, \sigma^2)$
- ☐ B $e \sim N(0, \sigma^2 M)$ (M is a matrix)
- ☐ C It does not have distribution
- ☐ D I do not know

✗ 7. b parameters can be computed using only

- ☐ A OLS
- ☒ B ML
- ☐ C Neither
- ☐ D I do not know

✓ 8. In the case of multiple linear regression

- ☒ A $\text{adj } R^2 < 1$ (always)
- ☐ B $\text{adj } R^2 \leq 1$ (always)
- ☐ C I do not know

✓ 9. $b =$

- ☒ A $(X'X)^{-1}X'Y$
- ☐ B $(X'X)^{-1}Y'X$
- ☐ C $(Y'X)^{-1}Y'X$
- ☐ D I do not know

✗ 10. The total sum of squares equals

- ☐ A $\text{Sum}((y - \text{mean}(y))^2)$
- ☐ B $\text{Sum}((\hat{y} - \text{mean}(y))^2)$
- ☒ C $\text{Sum}((y - \hat{y})^2)$
- ☐ D I do not know

✓ 11. The regression sum of squares equals

- A $\text{Sum}((y - \text{mean}(y))^2)$
- B $\text{Sum}((\hat{y} - \text{mean}(y))^2)$
- C $\text{Sum}((y - \hat{y})^2)$
- D I do not know

✗ 12. If RSS is the regression sum of squares and ESS is the error sum of squares then

- A $R^2 = 1 - \text{ESS}/\text{TSS}$
- B $R^2 = \text{ESS}/\text{TSS}$
- C $R^2 = \text{ESS}/\text{RSS}$
- D I do not know

✗ 13. Multicollinearity occurs when

- A $\text{rank}(X) < m$ (m is the number of explanatory variables)
- B $\text{var}(\epsilon) = \sigma^2 I$
- C $E(\epsilon) = 0$
- D $\text{cov}(\epsilon_i, \epsilon_j) = \text{const}$
- E I do not know

✓ 14. In simple linear regression model response variable (y) can be

- A binary
- B categorical
- C numeric
- D ordinal
- E I do not know

✗ 15. In a simple linear regression model, explanatory variables can be

- A binary
- B categorical
- C numeric
- D ordinal
- E I do not know
- F all answers are correct
- G Neither

✗ 16. If A is a matrix, X is the vector of random variables, then $\text{var}(AX) =$

- ☐ A $A'\text{var}(X)A$
- ☒ B $A^2\text{var}(X)$
- ☐ C $\text{var}(x)$
- ☐ D Can not be calculated
- ☐ E I do not know

✓ 17. Which of the answers can be used to conclude about the significance of variables (if any)?

- ☒ A t values
- ☐ B Estimated coefficients (only)
- ☐ C SE of estimated coefficients (only)
- ☐ D I do not know