Candidate Details

Linear Regression Quiz

Attempt all questions !!

1. The regression model includes a random error or disturbance term for a variety of reasons. Which of the following is NOT one of them? 1 point

- (●) omitted influences on Y (other than X)
- ( ) linear functional form is only an approximation
- ( ) the observable variables do not exactly correspond with their theoretical counterparts
- ( ) there may be approximation errors in the calculation of the least squares estimates

2. Which of the following assumptions about the error term is not part of the so called "classical assumptions"? 1 point

- ( ) it has a mean of zero
- (●) it has a constant variance
- ( ) its value for any observation is independent of its value for any other observation
- ( ) it has a normal distribution

3. Which of the following is NOT true? 1 point

- [x] the point Xbar, Ybar always lies on the regression line
- [ ] the sum of the residuals is always zero
- [ ] the mean of the fitted values of Y is the same as the observed values of Y
- [ ] there are always as many points above the fitted line as there are below it
- [ ] the regression line minimises the sum of the squared residuals

4. In a simple linear regression model the slope coefficient measures. 1 point

- [ ] the elasticity of Y with respect to X
- [ ] the change in Y which the model predicts for a unit change in X
- [ ] the change in X which the model predicts for a unit change in Y
- [ ] the ratio Y/X
- [ ] the value of Y for any given value of X

5. Changing the units of measurement of the Y variable will affect all but which one of the following? 1 point

- [ ] the estimated intercept parameter
- [ ] the estimated slope parameter
- [ ] the Total Sum of Squares for the regression
- [ ] R squared for the regression
- [ ] the estimated standard errors

6. A fitted regression equation is given by Yhat = 20 + 0.75X. What is the value of the residual at the point X=100, Y=90? 1 point

- 5
- -5
- 0
- 15

7. What is the number of degrees of freedom for a simple bivariate linear regression with 20 observations? 1 point

- 20
- 22
- 18
- 2

8. R squared measures 1 point

- the correlation between X and Y
- the amount of variation in Y
- the covariance between X and Y
- the residual sum of squares as a proportion of the Total Sum of Squares
- the explained sum of squares as a proportion of the Total Sum of Squares (correct answer)

9. What is a straight line that attempts to predict the relationship between two points, also known as a trend line or line of best fit? 1 point

- ◯ Scatterplot
- ◯ Regression line
- ◯ Slope formula
- ◯ Line segment

10. Multiple linear regression (MLR) is a _____ type of statistical analysis. 1 point

- ◯ univariate
- ◯ bivariate
- ◯ multivariate

11. The following types of data can be used in MLR (choose all that apply) 1 point

- ☐ Interval or higher dependent variable (DV)
- ☐ Interval or higher independent variables (IVs)
- ☐ Dichotomous IVs

12. A linear regression (LR) analysis produces the equation Y = 0.4X + 3. This indicates that: 1 point

- ◯ When Y = 0.4, X = 3
- ◯ When Y = 0, X = 3
- ◯ When X = 3, Y = 0.4
- ◯ When X = 0, Y = 3

13. A LR analysis produces the equation Y = -3.2X + 7. This indicates that: 1 point

- ◯ A 1 unit increase in X results in a 3.2 unit decrease in Y.
- ◯ A 1 unit decrease in X results in a 3.2 unit decrease in Y.
- ◯ A 1 unit increase in X results in a 3.2 unit increase in Y.
- ◯ An X value of 0 would would increase Y by 7.

14. The main purpose(s) of (LR) is/are (choose all that apply): 1 point

- ☐ Predicting one variable on the basis of another
- ☐ Explaining one variable in terms of another
- ☐ Describing the relationship between one variable and another
- ☐ Exploring the relationship between one variable and another

15. When writing regression formulae, which of the following refers to the predicted value on the dependent variable (DV)? 1 point

- Y
- Y (hat)
- X
- X (hat)

16. The major conceptual limitation of all regression techniques is that one can only ascertain relationships, but never be sure about underlying causal mechanism. 1 point

- True
- False

17. In MLR, the square of the multiple correlation coefficient or R2 is called the 1 point

- Option 1
- Coefficient of determination
- Variance
- Covariance
- Cross-product

18. What types of data require a multiple regression analysis? 1 point

- [ ] Continuous Y response and multiple continuous X variables.
- [ ] Continuous Y response and multiple discrete X variables
- [ ] Multiple discrete Y responses and a continuous X variable

19. What does the following expression (H0: β1 = β2 = 0) mean? 1 point

- ○ One of the independent variables is useful in predicting the dependent variable
- ○ Both of the independent variables are useful in predicting the dependent variable
- ○ None of the independent variables is useful in predicting the dependent variable
- ○ There is a third independent variable predicting the dependent variable

20. Which of the following criteria is the most optimal for assessing the goodness of the fit of a multiple linear regression model? 1 point

- ○ Adjusted R2
- ○ R2
- ○ The intercept
- ○ The coefficient

21. Why should we not include irrelevant variables in our regression analysis? 1 point

- ◯ Your R-squared will become too high
- ◯ Because of data limitations
- ◯ It is bad academic fashion not to base your variables on sound theory
- ◯ We increase the risk of producing false significant results

22. Which statistics can help us detect multicollinarity 1 point

- ☐ Variance inflation factor (VIF)
- ☐ F-statistic
- ☐ Durbin-Watson
- ☐ Tolerance values (1-VIF)

23. What does heteroskedasticity mean? 1 point

- ◯ The variance in the residuals are the same regardless of their predicted values.
- ◯ There is variance in the residuals
- ◯ That we are unable to produce residuals
- ◯ The variance in the residuals differ depending on their predicted values

24. What are the two ways we can check for heteroskedasticity? 1 point

- [ ] We can examine a plot of predicted values vs the residuals
- [ ] We can run the Hausman test
- [ ] We can run the hettest command
- [ ] We can compare the F-test of two models

25. What formula would you use to calculate the coefficient of multiple determination (r2)? 1 point

- ◯ SSR/SST
- ◯ SSE/SST
- ◯ SSR/SSE
- ◯ (SSR+SSE)/SST

26. What is adjusted r2 "adjusted" for? 1 point

- ◯ The number of predictors only.
- ◯ The sample size only.
- ◯ The number of predictors and the sample size.
- ◯ None of the above.

27. What test would you use to test for the significance of individual regression coefficients in a multiple regression model with more than two explanatory variables? 1 point

- The Z test.
- The t test.
- The F test.
- None of the above.

28. Which of the following is correct regarding the value of the adjusted r2 in a multiple regression model? 1 point

- It can be negative.
- It has to be positive.
- It has to be larger than the coefficient of multiple determination.
- It can be larger than 1.

29. If one wishes to incorporate seasonal dummy variables for monthly data into a regression model, how many dummy variables should be in the model? 1 point

- 12
- 11
- 10
- 1

30. Besides the estimated regression coefficient and appropriate t statistic, what else is needed to construct a confidence interval for a regression coefficient? 1 point

- ◯ The standard error of the regression coefficient.
- ◯ The F statistic.
- ◯ The standard error of the estimate.
- ◯ The coefficient of determination

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