Candidate Details

Total points 18/30

Hackathon Quiz

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0 of 0 points

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Linear Regression Quiz

18 of 30 points

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? 0/1

- (●) 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

Correct answer

- (●) 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"? 0/1

- ( ) 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

Correct answer

- (●) it has a normal distribution

✓ 3. Which of the following is NOT true? 1/1

- ○ 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. 1/1

- ○ 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? 0/1

- (●) 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

Correct answer

- (●) R squared for the regression

✓ 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? 1/1

- ( ) 5
- (●) -5 ✓
- ( ) 0
- ( ) 15

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

- 20
- 22
- 18 ✓
- 2

✓ 8. R squared measures 1/1

- 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? 1/1

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

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

- ○ univariate
- ○ bivariate
- ◉ multivariate ✓

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

- ☑ 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: 1/1

- ○ 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: 1/1

- (●) 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): 0/1

- [x] Predicting one variable on the basis of another ✓
- [x] Explaining one variable in terms of another ✓
- [x] Describing the relationship between one variable and another ✗
- [x] Exploring the relationship between one variable and another ✗

Correct answer

- [x] Predicting one variable on the basis of another
- [x] Explaining one variable in terms of another

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

- ○ 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. 1/1

- ◉ True ✓
- ○ False

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

- ○ Option 1
- ◉ Coefficient of determination ✓
- ○ Variance
- ○ Covariance
- ○ Cross-product

✗ 18. What types of data require a multiple regression analysis? 0/1

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

Correct answer

- [x] Continuous Y response and multiple continuous X variables.

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

- ( ) 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? 1/1

- (•) Adjusted R2 ✓
- ( ) R2
- ( ) The intercept
- ( ) The coefficient

✗ 21. Why should we not include irrelevant variables in our regression analysis? 0/1

- (●) 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

Correct answer

- (●) We increase the risk of producing false significant results

✗ 22. Which statistics can help us detect multicollinarity 0/1

- [x] Variance inflation factor (VIF) ✓
- [ ] F-statistic
- [x] Durbin-Watson ✗
- [x] Tolerance values (1-VIF) ✓

Correct answer

- [x] Variance inflation factor (VIF)
- [x] Tolerance values (1-VIF)

✗ 23. What does heteroskedasticity mean? 0/1

- (●) 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

Correct answer

- (●) The variance in the residuals differ depending on their predicted values

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

- [x] We can examine a plot of predicted values vs the residuals ✓
- [ ] We can run the Hausman test
- [x] 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)? 0/1

- ○ SSR/SST
- ◉ SSE/SST ✗
- ○ SSR/SSE
- ○ (SSR+SSE)/SST

Correct answer

- ◉ SSR/SST

✓ 26. What is adjusted r2 "adjusted" for? 1/1

- ○ 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? 1/1

- ○ 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? 0/1

- ○ 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.

Correct answer

- ◉ It can be negative.

✗ 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? 0/1

- (●) 12 ✗
- ( ) 11
- ( ) 10
- ( ) 1

Correct answer

- (●) 11

✗ 30. Besides the estimated regression coefficient and appropriate t statistic, what else is needed to construct a confidence interval for a regression coefficient? 0/1

- ( ) The standard error of the regression coefficient.
- ( ) The F statistic.
- (●) The standard error of the estimate. ✗
- ( ) The coefficient of determination

Correct answer

- (●) The standard error of the regression coefficient.