Formulas

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Statistics 2
PSBE2-07

Exercises

First partial exam

1. The strength (degree) of the correlation between a set of independent variables and a dependent variable is measured by
   (a) Coefficient of Correlation
   (b) Coefficient of Determination
   (c) Standard error of estimate
   (d) All of the above
2. The percent of total variation of the dependent variable explained by the set of independent variables is measured by
   (a) Coefficient of Correlation
   (b) Coefficient of Skewness
   (c) Coefficient of Determination
   (d) Standard Error of Estimate
   (e) Multicollinearity
3. A coefficient of correlation is computed to be -0.95 means that
   (a) The relationship between two variables is weak
   (b) The relationship between two variables is strong and positive
   (c) The relationship between two variables is strong and but negative
   (d) Correlation coefficient cannot have this value
4. Let the coefficient of determination computed to be 0.39 in a problem involving one independent variable and one dependent variable. This result means that
   (a) The relationship between two variables is negative
   (b) The correlation coefficient is 0.39 also
   (c) 39% of the total variation is explained by the independent variable
   (d) 39% of the total variation is explained by the dependent variable
5. Relationship between correlation coefficient and coefficient of determination is that
   (a) both are unrelated
   (b) The coefficient of determination is the coefficient of correlation squared
   (c) The coefficient of determination is the square root of the coefficient of correlation
   (d) both are equal

6. Multicollinearity exists when
   (a) Independent variables are correlated less than -0.70 or more than 0.70
   (b) An independent variables is strongly correlated with a dependent variable
   (c) There is only one independent variable
   (d) The relationship between dependent and independent variable is non-linear
7. If "time" is used as the independent variable in a simple linear regression analysis, then which of the following assumption could be violated
   (a) There is a linear relationship between the independent and dependent variables
   (b) The residual variation is the same for all fitted values of the dependent variable
   (c) The residuals are normally distributed
   (d) Successive observations of the dependent variable are uncorrelated
8. In multiple regression, when the global test of significance is rejected, we can conclude that
   (a) All of the net sample regression coefficients are equal to zero
   (b) All of the sample regression coefficients are not equal to zero
   (c) At least one sample regression coefficient is not equal to zero
   (d) The regression equation intersects the Y-axis at zero.
9. A residual is defined as
   (a) $y_i - \hat{y}_i$
   (b) Error sum of square
   (c) Regression sum of squares
   (d) Type I Error
10. What test statistic is used for a global test of significance?
   (a) Z test
   (b) t test
   (c) Chi-square test
   (d) F test
11. In multiple regression analysis, the correlation among the independent variables is termed
   (a) homoscedasticity
   (b) linearity
   (c) multicollinearity
   (d) adjusted coefficient of determination
12. In a multiple regression model, the error term e is assumed to
   (a) have a mean of 1
   (b) have a variance of zero
   (c) have a standard deviation of 1
   (d) be normally distributed

13. In order to test for the significance of a regression model involving 14 independent variables and 50 observations, the numerator and denominator degrees of freedom (respectively) for the critical value of F are
    (a) 13 and 48
    (b) 13 and 49
    (c) 14 and 48
    (d) 14 and 35
    (e) none of the above
14. A multiple regression analysis includes 4 independent variables results in sum of squares for regression of 1400 and sum of squares for error of 600. The VAF will be:
    (a) 0.300
    (b) 0.700
    (c) 0.429
    (d) 0.084
    (e) none of the above
15. There are situations where a set of explanatory variables forms a logical group. The test to determine whether the extra variables provide enough extra explanatory power to warrant inclusion in the equation is the:
    (a) complete F-test
    (b) reduced F-test
    (c) partial F-test
    (d) reduced t-test
    (e) none of the above
16. In the example of explaining a person's height by means of his/her right and left foot length, how would you treat for multicollinearity?
    (a) Eliminate the right foot variable
    (b) Eliminate the left foot variable
    (c) Eliminate either foot variable
    (d) Eliminate both feet variables
    (e) None of the above
17. Determining which variables to include in regression analysis by estimating a series of regression equations by successively adding or deleting variables according to prescribed rules is referred to as:
    (a) elimination regression
    (b) logical regression
    (c) forward regression
    (d) backward regression
    (e) stepwise regression
18. In Regression Analysis $\sum \hat{Y}$ is equal to
    (a) 0
    (b) $\sum Y$
    (c) b_0
    (d) $b_1 \sum X$
    (e) None

19. In the Least Square Regression Line, $\sum(Y - \hat{Y})^2$ is always

    (a) Negative
    (b) Zero
    (c) Non-Negative
    (d) Fractional
    (e) None

20. Which one is equal to explained variation divided by total variation?

    (a) Sum of squares due to regression
    (b) Coefficient of Determination
    (c) Standard Error of Estimate
    (d) Coefficient of Correlation

21. The best fitting trend is one for which the sum of squares of error is

    (a) Zero
    (b) Minimum (Least)
    (c) Maximum
    (d) None

22. If a straight line is fitted to data, then

    (a) $\sum Y = \sum \hat{Y}$
    (b) $\sum Y > \sum \hat{Y}$
    (c) $\sum Y < \sum \hat{Y}$
    (d) $\sum(Y - \hat{Y})^2 = 0$

23. In Regression Analysis two regression lines intersect at the point

    (a) (0, 0)
    (b) (b_0, b_0)
    (c) (X, Y)
    (d) $(\overline{X}, \overline{Y})$
    (e) None

24. In the Least Square Regression line the quantity $\sum(Y - \hat{Y})$ is always

    (a) Negative
    (b) Zero
    (c) Positive
    (d) Fractional
    (e) None