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| --- | --- | --- |
| 1 | What is correlation? Sketch the scatter plots for positive correlation, negative correlation, strong correlation, no correlation. |  |
| 2 | Explain in brief about standard deviation. Write a short note on the measure of skewness. |  |
| 3 | Find Karl Pearson's coefficient of correlation for the given data:  X: 65, 66, 67, 67, 68, 69, 70, 72  Y: 67, 68, 65, 68, 72, 72, 69, 71 |  |
| 4 | If the tangent of the angle made by the line of regression of y on x is 0.6, find the correlation coefficient between x and y. Given: standard deviation of y is equal to standard deviation of x. |  |
| 5 | Give the values of correlation coefficient for perfectly positive correlation, perfectly negative correlation and zero correlation. Hence, give the range of correlation coefficient. Write the equations for lines of regression of y on x and x on y respectively. |  |
| 6 | Find the estimated value of X when Y=12.2. Mean of X = 14.8, Mean of Y = 7.6, Standard deviation of X = 2.5 and Standard deviation of Y =3.6. Consider r =1. |  |
| 7 | The coefficient of correlation between two variables x and y is 0.48. The covariance is 36. Variance of x is 16. Find standard deviation of y. |  |
| 8 | Define Regression. Explain Measure for Model Fit. What are the types of regression |  |
| 9 | From the following Data   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | X | 68 | 66 | 67 | 67 | 68 | 69 | 70 | 72 | | Y | 67 | 68 | 65 | 63 | 72 | 72 | 69 | 71 |   Find : 1. Coefficient of Regression  2. lines of Regression  3. Coefficient of correlation |  |
| 10 | Find out the regression equations, x on y and y on x from the following data.  x 10 20 30 40 50 60 70  y 11 25 35 43 60 67 7 |  |
| 11 | Find out the regression equations from the following data:  x 17 22 29 31 37 42 51  y 8 25 14 27 13 17 37 |  |
| 12 | From the following data, calculate  1. Correlation co-efficient  2. Standard Deviation of y (sy)  bxy = 0.95y; byx = 0.99x |  |
| 13 | From the following data, calculate the expected value of y when x = 22  x y  Average 8.6 15.5  Standard Deviation 4.6 3.5  r = 0.98 |  |
| 14 | Obtain the lines of two regressions for the following data and calculate the  co-efficient of correlation.  X 10 20 30 40 50 60 70  Y 8 6 10 14 7 12 9  Obtain the value of y when x = 6.5. |  |
| 15 | The following table gives the various values of two variables:  X 21 22 29 28 43 49 33  Y 28 24 29 26 33 37 28  Determine the regression equations which may be associated with these values and calculate co-efficient of correlation. |  |
| 16 | In a correlation analysis between production and price of a commodity, the following constants were obtained.  Production Index Price Index    x 110 98  S.D. 12 5  R 0.4  Write down the two regression equations. Find the price index when the production index is 116. |  |
| 17 |  |  |
| 18 |  |  |
| 19 | Find the mean value of variables x and y and the correlation co-efficient from the following regression equations:  2y - x = 50; 3y - 2x = 10 |  |
| 20 | The following calculation has been made for prices of twelve stocks (x) on the Calcutta Stock Exchange on a certain day along with the volume of sales in thousands of shares (y). From these calculations, find the regression equation of prices on stocks, on the volume of sales of shares.  ∑x = 600 ; ∑ y = 400 ; ∑xy = 12300; ∑ x2 = 41658;∑ y2 = 17300. |  |
| 21 |  | B.L.Aggarwal |
| 22 | Following information is obtained from the records of a business organization     1. Compute regression coefficients 2. Obtain the two regression equations and 3. Estimate the advertisement expenditure for a sale of Rs. 1,20,000 |  |
| 23 | Two random variables have the regression equations  3X + 2Y-26 = 0  6X+Y-31 = 0  Find the mean values and the coefficient of correlation between X and Y. If the variance of X=25, find the standard deviation of Y from the data given above. |  |
| 24 | Given the Following Data:-  **X Y**  **A Mean** 36 85  **S.D** 11 8  Correlation co-efft – 0.66   1. Find two Regression Equation:- 2. Estimate the Value of X when Y = 75 |  |
| 25 | Find the regression of X on Y from the following data    Find the estimated value of x when y = 6 |  |
| 26 | The weight of the person is related to his height. Find the relationship between height and weight using linear regression and also predict the weight of the person whose height is 170cm   |  |  | | --- | --- | | Height | Weight | | 151 | 63 | | 174 | 81 | | 138 | 56 | | 186 | 91 | | 128 | 47 | | 136 | 57 | | 179 | 76 | | 163 | 72 | | 152 | 62 | | 131 | 48 | |  |
| 27 | Discuss briefly your understanding about Intercept ,Slope , R2 ,MAE and MAPE |  |
| 28 | What do you understand by regression model? What are its uses | Statistical method by S.P. Gupta  Page no regression analysis 11.3 |
| 29 | Differentiate between correlation and regression Analysis | Statistical method by S.P. Gupta  Page no regression analysis 11.4 |
| 30 | What is linear regression? Explain least square method of fitting a regression line. | B.L.Agaarwal  Page no.387 |
| 31 | Explain following Error terms  i) Mean Squared Error ii) Mean absolute error iii) Root Mean Squared Error iv) R-squared | https://www.studytonight.com/post/what-is-mean-squared-error-mean-absolute-error-root-mean-squared-error-and-r-squared |
| 32 | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Test Scores(X) | 14 | 19 | 24 | 21 | 28 | 22 | 15 | 20 | 19 | | Sales In Rs (’00)(Y) | 31 | 36 | 48 | 37 | 50 | 45 | 33 | 41 | 39 |   Departmental store gives in service training to salesman. In post training test, consider whether it should terminate the services of any of the salesman who does not qualify in the test. The above data gives test scores and sales made by nine salesmen during fixed period. If the firm wants a minimum sales volume of Rs.3000, what is the minimum test score that will ensure continuation of the service? | Basic Statistics by B.L.Agaarwal  Page no.433 |
| 33 | The table below gives the total grain production and production of cereals in lakh tonnes for nine years, Estimate the total production of the cereal production of 90lakhs   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Total grain production(Y) | 400 | 440 | 480 | 550 | 620 | 650 | 660 | 740 | 760 | | Cereal production(Y) | 50 | 60 | 70 | 85 | 95 | 100 | 105 | 115 | 120 | | Basic Statistics by B.L.Agaarwal  Page no.396 |
| 34 | Following are data pertaining to the production and export of sugar in lakh tonnes in India from 1971 to 1982.  Production(X)  Export(Y)   |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | (X) | 37.4 | 31.1 | 38.7 | 39.5 | 47.9 | 42.6 | 48.4 | 64.6 | 58.4 | 38.6 | 51.4 | 84.0 | | (Y) | 3.9 | 1.33 | 1.10 | 4.39 | 9.41 | 9.67 | 3.41 | 2.51 | 8.62 | 9.90 | 6.64 | 6.50 |   (a) Fit a regression line of y on x and hence predict Y if X=50 Lakh. | Basic Statistics by B.L.Agaarwal  Page no.432 |
| 35 | Departmental store gives in service training to salesman. In post training test, it is experienced that the performance regarding sales of any salesman is linearly related to the scores secured by him. The above data gives test scores and sales made by nine salesmen during fixed period. Predict the sales done by salesman having score 30.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Test Scores(X) | 16 | 22 | 28 | 24 | 29 | 25 | 16 | 23 | 24 | | Sales In Rs(Y) | 35 | 42 | 57 | 40 | 54 | 51 | 34 | 47 | 45 | | Basic Statistics by B.L.Agaarwal  Page no.391 |
| 36 | Given the bivariate data   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | (X) | 6 | 2 | 10 | 4 | 8 | | (Y) | 9 | 11 | 5 | 8 | 7 |   Find regression equation Yon X and X on Y | Statistical method by S.P. Gupta  Page no regression analysis 11.7 |
| 37 | Given the bivariate data   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | (X) | 1 | 5 | 3 | 2 | 1 | 1 | 7 | 3 | | (Y) | 6 | 1 | 0 | 0 | 1 | 2 | 1 | 5 |   (a) Fit a regression line of y on x and hence predict Y if X=10.  (b) Fit a regression line of x on y and hence predict X if Y=2.5 | Statistical method by S.P. Gupta  Page no regression analysis 11.7 |
| 38 | Describe Linear regression in detail. |  |
| 39 | Explain Regression Equation of Y on X and Regression Equation of X on Y. Also derive the relation of two regression coefficients with correlation coefficient |  |
| 40 | Define the following terms  i) MAE  ii) MSE  iii) RMSE  iv) R2 |  |
| 41 | Find out the regression equations. X on Y and Y on X from the following data |  |
| 42 | The following calculations have been made for prices of twelve stocks (x) on the Calcutta stock Exchange on a certain day along with the volume of sales in thousands of shares (y). From these calculations find the regression equation of prices on stocks, on the volume of  Ʃ x= 600, Ʃ y= 400, Ʃ xy=12300, Ʃx2= 41658, Ʃy2=17300 |  |
| 43 |  |  |
| 44 | Introduction to Linear Regression and Correlation Analysis | <https://drive.google.com/file/d/1o42O66khxagQC4lLdoXalsKHjwv4uiTI/view?usp=sharing> |
| 45 | Karl Pearson’s Coefficient of Correlation | <https://drive.google.com/file/d/1o42O66khxagQC4lLdoXalsKHjwv4uiTI/view?usp=sharing> |
| 46 | Introduction to Regression Analysis and Coefficient of Determination (R2) | <https://drive.google.com/file/d/1o42O66khxagQC4lLdoXalsKHjwv4uiTI/view?usp=sharing> |
| 47 | Linear Regression Algorithm, Mean Square Error, Checking the Goodness of fit, Standard Error of the Estimate | <https://drive.google.com/file/d/1j5VFZpF2UUeUqVIyhT_tWHXU79i4h3Xi/view?usp=sharing> |
| 48 | a) General form of the regression equation of X on Y & Regression Lines X on Y  b) General form of the regression equation of Y on X & Regression Lines Y on X | <https://drive.google.com/file/d/1Gw9KhQ0Qj9xNDwlblCs-jCj3BK6kzx1R/view?usp=sharing> |
| 49 | Determining Correlation Coefficient (r) | <https://drive.google.com/file/d/1Gw9KhQ0Qj9xNDwlblCs-jCj3BK6kzx1R/view?usp=sharing> |
| 50 | Methods to Check the Performance of Regression Models: MAE, MSE, R2, MAPE (Moving Averages) | <https://drive.google.com/file/d/1mQK2Y-NuNkHLwsHI5W6Ok0sPuE_-Il1k/view?usp=sharing> |
| 51 | Derivation of Linear regression by Least Square method |  |
| 52 | What is mean Bias (Error) & Precision (Variance) with formula and example |  |
| 53 | Define MAPE, MAE, RMSE with formula and example |  |
| 54 | Derivation for R2 and Adjusted R2. What is Degree of freedom. |  |
| 55 | Relationship between degree of freedom and training data. |  |
| 56 | Relationship of R2 and Adjusted R2 with additional of one independent variable |  |
| 57 | Using t-test check significance of independent variable. |  |
| 58 | Perform simple linear regression    Determine slope and intercept | 1. C. Gupta Chapter 10 and 11   Net |
| 59 | Perform simple linear regression    Determine slope and intercept |  |
| 60 | Exercise on find correlation of the following data   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | | y | 15 | 16 | 14 | 13 | 11 | 12 | 10 | 8 | 9 | |  |
| 61 | Compare regression and correlation |  |
| 62 | Compare regression line of y on x and regression line of x on y. |  |
| 63 | Calculate regression lines (x on y and y on x) for the following data   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 6 | 2 | 10 | 4 | 8 | | y | 9 | 11 | 5 | 8 | 7 | |  |
| 64 | For the following data   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | y | 8 | 8 | 10 | 12 | 11 | 13 | 14 | 16 | 15 |  1. Obtain two regression lines 2. Calculate Correlation Coefficient 3. Estimate the value of y for x=6.2 |  |