**30.05.2021**

Curve Fitting -Method of least squares

1. Fitting of a straight line:
2. Fitting of a parabola:
3. Fitting of an exponential curve:
4. Fitting of an exponential curve:

Fitting of a straight line

Normal equations are:

Fitting of a Parabola:

Normal equations are:

Fitting of an exponential curve:

Normal equations are:

After solving for and , take antilog to get back the original values.

Mean

Variance

Covariance

Correlation

Where

**Karl pearson’s coefficient of correlation**

**31.05.2021**

Spearman’s Rank Correlation Coefficient:

where

**Tie or Repeated Ranks:**

When there is repetition in ranks...

Here

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | Y | Rank | Rank |  |  |
| 78 | 124 | 7 | 3 |  |  |
| 89 | 123 | 4 | 7 |  |  |
| 79 | 124 | 6 | 3 |  |  |
| 89 | 124 | 4 | 3 |  |  |
| 89 | 125 | 4 | 5.5 |  |  |
| 98 | 125 | 1.5 | 5.5 |  |  |
| 98 | 126 | 1.5 | 1 |  |  |

Where correlation factor

Consider x:

98 is repeated twice, therefore

Correlation factor for 98

89 is repeated thrice, therefore

Correlation factor for 98

Consider y:

125 is repeated twice, therefore

Correlation factor for 125

124 is repeated thrice, therefore

Correlation factor for 124

Multiple correlation formula:

Regression line for on :

Where

and

From the tabulated value, how to find

Regression line for on :

Where

From the tabulated value, how to find

**Formula for correlation coefficient from given regression coefficients (say**  and  **):**

**For problems:**

[**https://www.brainkart.com/article/Solved-Example-Problems-for-Regression-Analysis\_37036/#:~:text=The%20two%20regression%20lines%20were%20found%20to%20be%204X%E2%80%935Y,and%202Y%3D5%E2%80%93X%20**](https://www.brainkart.com/article/Solved-Example-Problems-for-Regression-Analysis_37036/#:~:text=The%20two%20regression%20lines%20were%20found%20to%20be%204X%E2%80%935Y,and%202Y%3D5%E2%80%93X%20)**.**

**Partial Regression**

How to write regression equations:

Regression equation of on and :

Partial Correlation coefficient:

Regression equation of on and :

Partial Correlation coefficient:

Regression equation of on and :

Partial Correlation coefficient:

Computation of partial standard deviation:

**Relation between partial correlation coefficient and partial regression coefficients:**