Question

The following data on weekly family consumption expenditure "y" and weekly family income "x" are given.

Fit a simple linear regression line also show the sum of residual equal to zero

$$\hat{y} = 24.3 + 0.51x$$

$e = y - \hat{y}$

Y $	X $	X_iY_i	X_i^2
70	80	5600	6400
65	100	6500	10,000
90	120	10800	14400
95	140	13300	19600
110	160	17600	25600
115	180	20700	32400
120	200	24000	40000
140	220	30800	48400
155	240	37200	57600
150	260	39000	67600

- Fit regression line using normal equations.
- Coefficent of corelation
- Testing of α
- Testing of β

By using the following data apply least square and quadratic model

X:2,4,6,7,8,10

Y:7,6,3,9,8

Also find coefficient of correlation and interpret the result.

For the following data to test the hypothesis that α =0 at 5% level of significance.

X:80, 100, 120, 140, 160, 180, 200, 220, 240,260.

Y:70, 65, 90, 95, 110, 115, 120, 140, 155,150.

Practical No 1:-

From the following data fit
a regression line Y on X and
X on Y where Y is a price and
X sale also show that

(i) Sum of error is equal to zero.
(ii) Predict / estimate sale X = 120
(iii) Predict / estimate Price when Y = 200

X: 110, 100, 95, 90, 110, 115, 113, 112, 109, 111

Y: 160, 170, 180, 150, 155, 140, 170, 185, 165, 175

Practical No 2 :-

From the following time series data set of 30 year people killed in a road accident by using least Square method.

I Fit a regression line using normal equation.

II Predict number of road accidents for next 5 year.

III Plot actual and fitted value on a graph paper.

Practical No 3:-

Carry out the necessory computations to obtain the least square estimates of the parameters in multiple regression model

$$Y_i = B_0 + B_1 X_{1i} + B_2 X_{2i} + E_i$$

given

$Y_i : 12, 10, 9, 13, 20$

$X_{1i} : 2, 2, 3, 4, 4$

$X_{2i} : 1, 1, 0, 0, 3$

also calculate the S.E of estimate $\hat{\sigma}_u^2$ and test the overall significance of the regression coefficients.

Question no 4:-

Fit an equation of the form $Y = ax^b$ to the following data

X: 1, 2, 3, 4, 5, 6

Y: 2.98, 4.26, 5.21, 6.10, 6.80, 7.50

also find the predicted value.

Practical No 5:-

By using the following data apply least square model & quardratic model

X: 2, 4, 6, 8, 10
Y: 7, 6, 3, 9, 8

also find cofficient of correlation and interpret the result whoes model gives better prediction.

Practical No 6:-

By using the following data fit linear regression modal and multiple linear regression modal

Y_i : 12, 10, 9, 13, 20
X_{1i} : 2, 2, 3, 4, 4
X_{2i} : 4, 4, 9, 16, 16

find R and $\bar{R}^2$ of both modals and interpret the result.

Practical No 7:-

By using the following data find the sample correlation cofficient.

X : 1, 2, 3, 4, 5
Y : 20, 19, 18, 17, 10

Practical No 8 :-

By using the following data

X: 10, 20, 30, 40, 50
Y: 2, 4, 6, 8, 10

find the sample correlation coefficient.

Practical No 1 :-

For the following data fit a linear regression model and test $\beta = 0$

$Y = 120, 130, 135, 138, 142, 149, 155, 158$
$\quad\quad 160, 169$

$X = 34, 37, 39, 42, 41, 45, 40, 52, 50,$
$\quad\quad 62$

Practical no 21-

This is a sample of size 27 on the basis of a regression line was found to be $Y = 25 + 2x$ given that $\hat{\sigma}_{Yx} = 1.50$, $\hat{\sigma}_x = 3.00$, $\bar{x} = 7.50$. Test the hypothesis that population regression coefficient is as low as 1.70

(b) As high as 2.20. $\alpha = 1\%$.

Practical No 3:-

For the following data to test the hypothesis that $\alpha = 0$ at 5% Level of significance

X	Y
80	70
100	65
120	90
140	95
160	110
180	115
200	120
220	140
240	155
260	150

Practical No 4:-

Find the value of F-statistic by using the value's,

$$\hat{\beta} = 1.62 \qquad , \qquad n = 10 \qquad , \qquad k = 2$$
$$\Sigma y_i^2 = 2090.4 \qquad , \qquad \Sigma e_i^2 = 443.184$$

to test the hypothesis at 5% Level of significance.

Practical No 5:

Two random samples drawn from a population with equal variances

Sample I			Sample II	
X_{1i}	Y_{1i}		X_{2i}	Y_{2i}
4	12		1	6
3	12		2	5
3	10		3	8
5	13		1	7

Test the hypothesis that $\beta_1 = \beta_2$ at 5% Level of significance.

Practical No 6:-

For the following data to test the hypothesis that there is linear relationship between x and y, or not using F-statistic

$$F = \frac{\Sigma \hat{y_i}^2 / k-1}{\Sigma e_i^2 / n-k} \sim F\text{-dist}$$

by using ANOVA Table at 5% Level of significance.