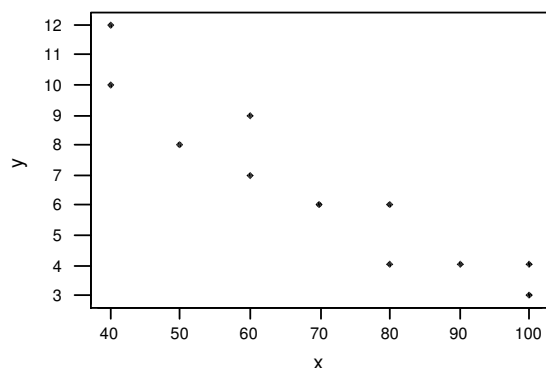


Lack of Fit Test when there are replicated x-settings

Ex Let x = amount calcium in diet, y = change in blood pressure over specified time period for each of 11 experimental subjects.

Row	x	y
1	40	10
2	40	12
3	50	8
4	60	7
5	60	9
6	70	6
7	80	4
8	80	6
9	90	4
10	100	3
11	100	4



Regression Analysis

The regression equation is
 $y = 15.2 - 0.123 x$

Predictor	Coef	StDev	T	P
Constant	15.241	1.113	13.70	0.000
x	-0.12292	0.01523	-8.07	0.000

S = 1.055 R-Sq = 87.9% R-Sq(adj) = 86.5%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	72.521	72.521	65.11	0.000
Residual Error	9	10.025	1.114		
Total	10	82.545			

Do you think you should try amending your model? (quadratic model? Transformation?)

Testing for the lack of fit of a linear model

Step 1 Calculate Pure Error SS = 6.5
and d.f pure error = 4

Step 2 Calculate Lack of fit SS = SSE – P. E SS
= 10.025 – 6.5
= 3.525
and d.f. LOF = d.f Error – d.f P.E.
= 9 – 4 = 5

Step 3 Calculate $MS_{LOF} = SS_{LOF}/d.f_{LOF}$
 $= 3.525/5 = 0.705$

and $MS_{PE} = SS_{PE}/d.f_{PE}$
 $= 6.5/4 = 1.625$

Step 4 Calculate the test statistic

$$F = MS_{LOF}/MS_{PE} = 0.705/1.625$$

$$= 0.43$$

Step 5 Compare this value with the
critical value from $F(5,4)$.

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	72.521	72.521	65.11	0.000
Residual Error	9	10.025	1.114		
Lack of Fit	5	3.525	0.705	0.43	0.808
Pure Error	4	6.500	1.625		
Total	10	82.545			