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MULTIPLE REGRESSION ESTIMATION AND PREDICTION

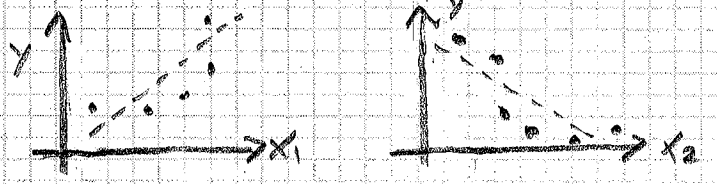
estimate Mean of y x_1 and x_2

Predict Individual value of y x_1 " x_2

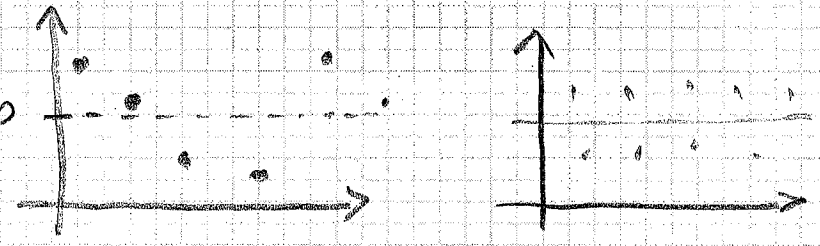
y	x_1	x_2
5	1	50
8	2	51
14	3	34
23	4	22
45	5	15
48	6	10

1) too few observations that produce an unreliable R^2

2) Scatter plots showed "bias" in x_1 and x_2



3) the Residual plot showed a "pattern" confirming our observations of the scatter plots



4) there was no reason to include x_2 into the model, after x_1 was already in it, because it didn't improve our model:

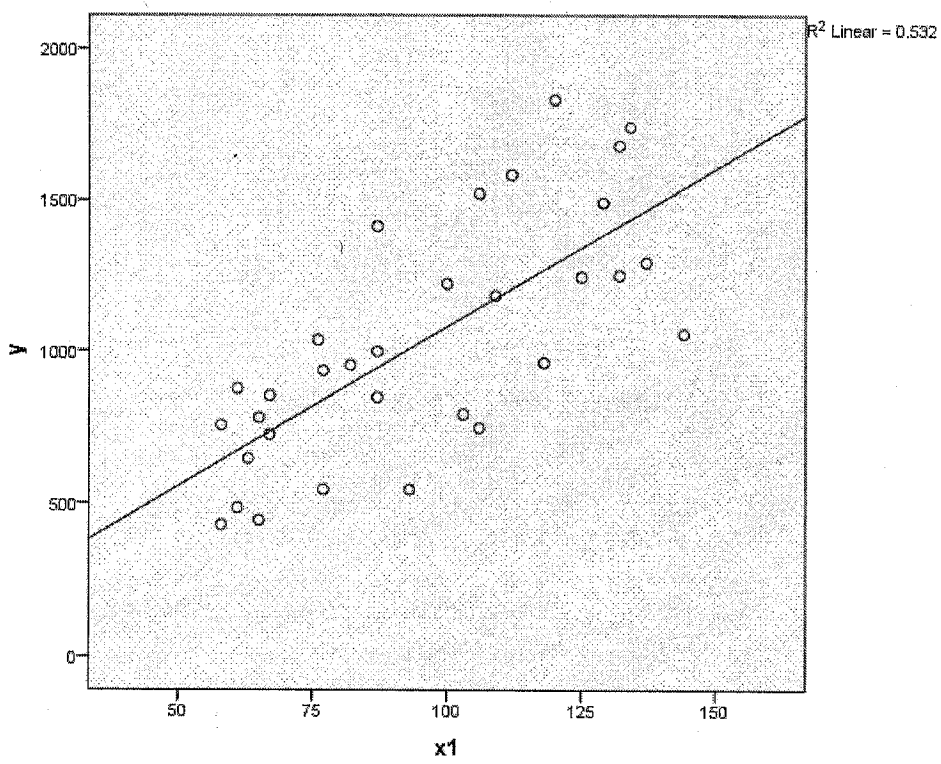
	R^2	F	pvalue
x_1 only	.924	48.723	.002
x_1 and x_2	.925	18.504	.021

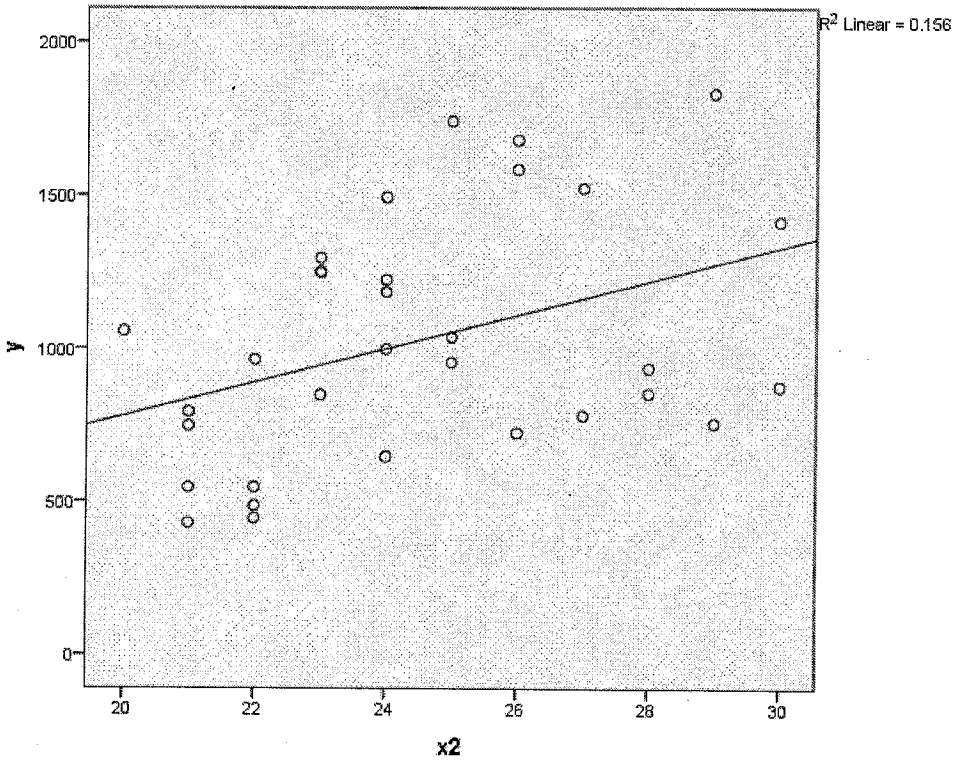
Estimate the mean value of y for all cases where $x_1 = 100$ and $x_2 = 20$

(609.29455 , 794.50484)

Predict the individual value of y for a single case where $x_1 = 100$ and $x_2 = 20$

(413.61438 , 990.18501)


R^2 Linear = 0.532
2000
1500
1000
500
0
y
50
75
100
125
150
x1


R^2 Linear = 0.156
2000
1500
1000
500
0
y
20
22
24
26
28
30
x2

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.730[a]	.532	.517	273.530	.532	34.152	1	30	.000
2	.945[b]	.892	.885	133.485	.360	96.971	1	29	.000

a. Predictors: (Constant), x1

b. Predictors: (Constant), x1, x2

c. Dependent Variable: y

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2555224.483	1	2555224.483	34.152	.000[b]
	Residual	2244565.017	30	74818.834		
	Total	4799789.500	31			
2	Regression	4283062.960	2	2141531.480	120.188	.000[c]
	Residual	516726.540	29	17818.157		
	Total	4799789.500	31			

a. Dependent Variable: y

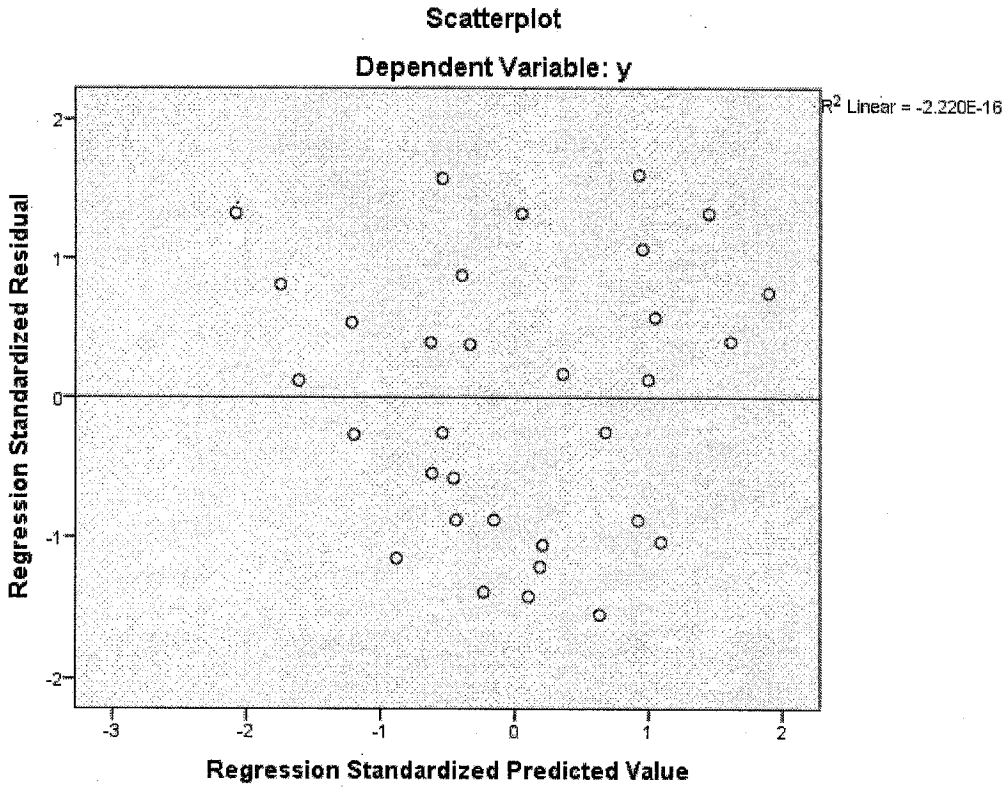
b. Predictors: (Constant), x1

c. Predictors: (Constant), x1, x2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	31.945	176.982		.180	.858	-329.501	393.391
	x1	10.480	1.793	.730	5.844	.000	6.817	14.142
2	(Constant)	-2291.217	251.230		-9.120	.000	-2805.040	-1777.395
	x1	12.741	.905	.887	14.082	.000	10.890	14.591
	x2	85.953	8.729	.620	9.847	.000	68.101	103.805

a. Dependent Variable: y



y	x1	x2	LMCI_1	UMCI_1	LICI_1	UICI_1
1036	76	25	766.91375	884.86793	546.58633	1105.19535
1831	120	29	1617.49830	1843.07777	1434.89976	2025.67632
1250	132	23	1284.82369	1450.09035	1082.21856	1652.69548
1584	112	26	1303.91942	1437.08956	1089.49509	1651.51389
1741	134	25	1475.78953	1653.89874	1277.67966	1852.00861
545	93	21	618.47733	778.86000	414.12804	983.20928
1183	109	24	1105.87033	1214.88327	881.98199	1438.77161
755	58	29	837.42733	1043.31756	648.60128	1232.14360
1245	125	23	1204.79434	1351.75166	995.55083	1560.99517
429	58	21	138.02558	367.47156	-43.38329	548.88043
1492	129	24	1337.15994	1493.21663	1131.24967	1699.12689
875	61	30	951.88640	1177.20790	769.20810	1359.88620
1293	137	23	1341.41285	1520.90693	1143.77993	1718.53986
485	61	22	278.15708	475.68947	86.60022	667.24633
444	65	22	334.55714	521.21400	139.36710	716.40404
1056	144	20	1146.78029	1378.18962	965.97141	1558.99850
962	118	22	1030.93104	1175.34095	820.74218	1385.52982
.	100	20	609.29455	794.50484	413.61438	990.18501