$X'X$

The REG Procedure
Model: MODEL1

Model Crossproducts X'X X'Y Y'Y

Variable	Intercept	x1	x2	x2sq	y
Intercept	10	190.09	56.51	412.7623	165.35
x1	190.09	8061.8657	1640.4116	14679.655592	6574.034
x2	56.51	1640.4116	412.7623	3323.565419	1348.5262
x2sq	412.7623	14679.655592	3323.565419	28273.561383	12004.502344
y	165.35	6574.034	1348.5262	12004.502344	5438.2429

→ $X'Y$

→ $Y'Y$

The REG Procedure
Model: MODEL1
Dependent Variable: y

Number of Observations Read	10
Number of Observations Used	10

$(X'X)^{-1}$

X'X Inverse, Parameter Estimates, and SSE

Variable	Intercept	x1	x2	x2sq	y
Intercept	1.4489080779	-0.085966558	-0.856100865	0.1241163792	9.9107930382
x1	-0.085966558	0.0140719141	0.0854121885	-0.016091361	0.306459682
x2	-0.856100865	0.0854121885	0.684714617	-0.112336367	-5.24022871
x2sq	0.1241163792	-0.016091361	-0.112336367	0.0197832292	0.73677386
y	9.9107930382	0.306459682	-5.24022871	0.73677386	6.7990811384

→ $\hat{\beta}$

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	2697.38157	899.12719	793.45	<.0001
Error	6	6.79908	1.13318		
Corrected Total	9	2704.18065			

Root MSE	1.06451	R-Square	0.9975
Dependent Mean	16.53500	Adj R-Sq	0.9962
Coeff Var	6.43792		

→ R^2 for model in subquestion 1

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	9.91079	1.28136	7.73	0.0002
x1	1	0.30646	0.12628	2.43	0.0514
x2	1	-5.24023	0.88085	-5.95	0.0010
x2sq	1	0.73677	0.14973	4.92	0.0027

The REG Procedure
Model: MODEL1
Dependent Variable: y

Durbin-Watson D	1.702
Pr < DW	0.2927

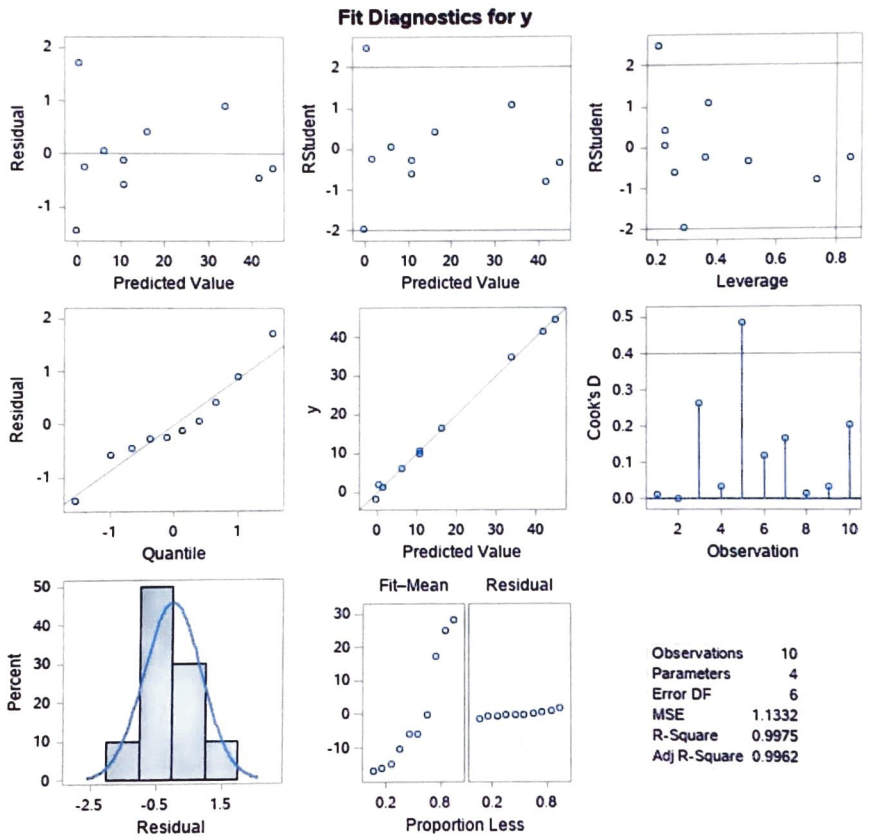
→ Test statistic

→ p-value for +ve autocorrelation

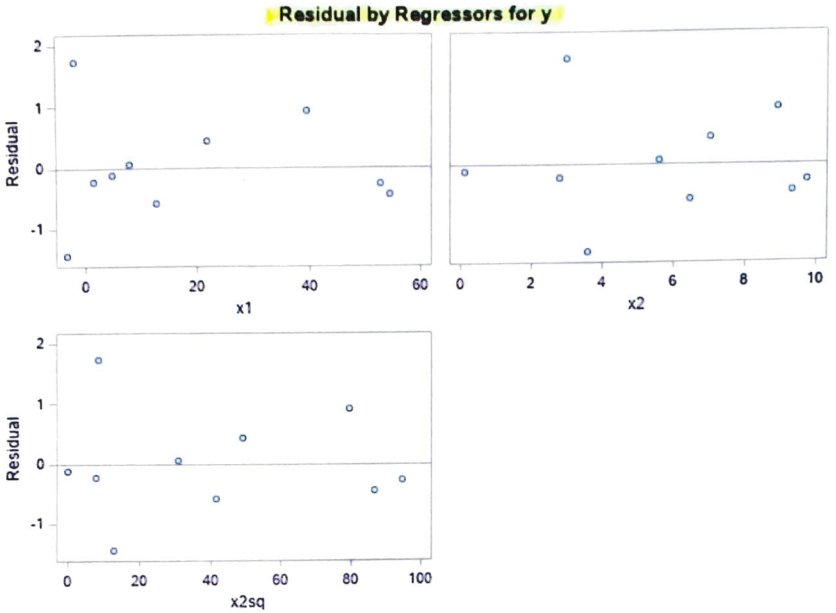
Number of Observations	10
1st Order Autocorrelation	-0.075

Note: Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

The REG Procedure
Model: MODEL1
Dependent Variable: y



Observations	10
Parameters	4
Error DF	6
MSE	1.1332
R-Square	0.9975
Adj R-Square	0.9962



The REG Procedure
Model: MODEL1

F-test for goodness of model

Test mytest Results for Dependent Variable y

Source	DF	Mean Square	F Value	Pr > F
Numerator	2	25.63895	22.63	0.0016
Denominator	6	1.13318		

p-value

T.S.

The REG Procedure
Model: MODEL1
Dependent Variable: y

Output Statistics			
Obs	Dependent Variable	Predicted Value	Residual
1	1.23	1.4639	-0.2339
2	6.12	6.0617	0.0583
3	-1.90	-0.4484	-1.4516
4	44.61	44.8784	-0.2684
5	41.28	41.7381	-0.4581
6	10.56	10.6824	-0.1224
7	34.78	33.8718	0.9082
8	16.57	16.1495	0.4205
9	10.09	10.6732	-0.5832
10	2.01	0.2794	1.7306
11	.	5.1936	.

93-4) prediction of y_0 for $x_{01}=10, x_{02}=5$

The REG Procedure
Model: MODEL1
Dependent Variable: y

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	2670.07318	890.02439	156.57	<.0001
Error	6	34.10747	5.68458		
Corrected Total	9	2704.18065			

R^2 for question 2

Root MSE	2.38424	R-Square	0.9874
Dependent Mean	16.53500	Adj R-Sq	0.9811
Coeff Var	14.41932		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	5.37954	2.04228	2.63	0.0388
x1	1	0.86145	0.30138	2.86	0.0289
x2	1	-1.05999	0.51644	-2.05	0.0859
x1x2	1	0.00469	0.03095	0.15	0.8844

The REG Procedure
Model: MODEL1
Dependent Variable: y