

التمرين 1: ليكن لديك النماذج التالية :

النموذج الأول:

Dependent Variable: Y
 Method: Least Squares
 Date: 04/13/26 Time: 09:52
 Sample (adjusted): 1 1289
 Included observations: 1289 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.183338	1.015788	-7.071691	0.0000
X1	-3.074875	0.364616	-8.433184	0.0000
X2	-1.565313	0.509188	-3.074139	0.0022
X3	1.095976	0.506078	2.165626	0.0305
X4	1.370301	0.065904	20.79231	0.0000
X5	0.166607	0.016048	10.38205	0.0000
R-squared	0.323339	Mean dependent var	12.36585	
Adjusted R-squared	0.320702	S.D. dependent var	7.896350	
S.E. of regression	6.508137	Akaike info criterion	6.588627	
Sum squared resid	54342.54	Schwarz criterion	6.612653	
Log likelihood	-4240.370	Hannan-Quinn criter.	6.597646	
F-statistic	122.6149	Durbin-Watson stat	1.897513	
Prob(F-statistic)	0.000000			

النموذج الثاني:

Dependent Variable: Y
 Method: Least Squares
 Date: 04/13/26 Time: 09:58
 Sample (adjusted): 1 1289
 Included observations: 1289 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.419035	1.035710	-8.128758	0.0000
X1	-3.009360	0.361432	-8.326210	0.0000
X2	-1.536077	0.504448	-3.045066	0.0024
X3	1.026979	0.501521	2.047728	0.0408
X4	1.323745	0.065937	20.07597	0.0000
X5	0.424463	0.053580	7.922075	0.0000
X5^2	-0.006183	0.001227	-5.039494	0.0000
R-squared	0.336483	Mean dependent var	12.36585	
Adjusted R-squared	0.333378	S.D. dependent var	7.896350	
S.E. of regression	6.447128	Akaike info criterion	6.570563	
Sum squared resid	53286.93	Schwarz criterion	6.598593	
Log likelihood	-4227.728	Hannan-Quinn criter.	6.581084	
F-statistic	108.3548	Durbin-Watson stat	1.901169	
Prob(F-statistic)	0.000000			

النموذج الثالث:

Dependent Variable: Y
 Method: Least Squares
 Date: 04/13/26 Time: 10:03
 Sample (adjusted): 1 1289
 Included observations: 1289 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.200668	1.072115	-8.581791	0.0000
X1	-1.433980	0.680797	-2.106326	0.0354
X2	-1.481891	0.503577	-2.942731	0.0033
X3	0.949027	0.501081	1.893958	0.0585
X4	1.318365	0.065801	20.03554	0.0000
X5	0.471974	0.056212	8.396344	0.0000
X5^2	-0.006274	0.001224	-5.124559	0.0000
X5*X1	-0.084151	0.030848	-2.727939	0.0065
R-squared	0.340315	Mean dependent var	12.36585	
Adjusted R-squared	0.336711	S.D. dependent var	7.896350	
S.E. of regression	6.430992	Akaike info criterion	6.566322	
Sum squared resid	52979.16	Schwarz criterion	6.598357	
Log likelihood	-4223.994	Hannan-Quinn criter.	6.578346	
F-statistic	94.40528	Durbin-Watson stat	1.892702	
Prob(F-statistic)	0.000000			

المطلوب:

- قارن بين النماذج الثلاثة؛
- لماذا تم اعتماد النموذج الأول الثاني وكيف نسمي النموذج الأول، الثاني والثالث.
- هل النموذج الأول به أخطاء التوصيف مقارنة مع النموذج الثالث (قم بحساب قيمة F)؛
- أشرح خطوات اختبار Ramsey's Reset؛
- أشرح خطوات The Lagrange multiplier (LM) test؛
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	Value	df	Probability
F-statistic	20.12362	(2, 1281)	0.0000
Likelihood ratio	39.87540	2	0.0000

Unrestricted Test Equation:

Dependent Variable: Y

Method: Least Squares

Date: 04/13/26 Time: 10:46

Sample: 1 1289

Included observations: 1289

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.412981	2.453617	1.798561	0.0723
X1	-0.059017	0.797535	-0.073999	0.9410
X2	-0.195466	0.631646	-0.309454	0.7570
X3	0.124108	0.564161	0.219987	0.8259
X4	0.080124	0.302395	0.264966	0.7911
X5	0.000969	0.042470	0.022809	0.9818
FITTED^2	0.044738	0.020767	2.154294	0.0314
FITTED^3	-0.000311	0.000601	-0.517110	0.6052

R-squared	0.343951	Mean dependent var	12.36585
Adjusted R-squared	0.340366	S.D. dependent var	7.896350
S.E. of regression	6.413247	Akaike info criterion	6.560795
Sum squared resid	52687.19	Schwarz criterion	6.592830
Log likelihood	-4220.433	Hannan-Quinn criter.	6.572820
F-statistic	95.94255	Durbin-Watson stat	1.894263
Prob(F-statistic)	0.000000		

Dependent Variable: S1

Method: Least Squares

Date: 04/13/26 Time: 11:01

Sample (adjusted): 1 1289

Included observations: 1289 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.017330	1.072115	-1.881636	0.0601
X1	1.640895	0.680797	2.410257	0.0161
X2	0.083422	0.503577	0.165659	0.8685
X3	-0.146949	0.501081	-0.293264	0.7694
X4	-0.051936	0.065801	-0.789287	0.4301
X5	0.305367	0.056212	5.432437	0.0000
X5^2	-0.006274	0.001224	-5.124559	0.0000
X1*X5	-0.084151	0.030848	-2.727939	0.0065

R-squared	0.025089	Mean dependent var	1.15E-15
Adjusted R-squared	0.019761	S.D. dependent var	6.495492
S.E. of regression	6.430992	Akaike info criterion	6.566322
Sum squared resid	52979.16	Schwarz criterion	6.598357
Log likelihood	-4223.994	Hannan-Quinn criter.	6.578346
F-statistic	4.709394	Durbin-Watson stat	1.892702
Prob(F-statistic)	0.000031		