Exam Crib

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Model Summary[d]

Model	R	R Square (proportion of variability explained)	Adjusted R Square (Efficiency of model)	Std. Error of the Estimate
1	.874[a]	.764 (%)	.746	2.42873
2	.930[b]	.864	.842	1.91827
3	.956[c]	.914	.891	1.59226

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	248.453	1	248.453	42.120	.000[a]
	Residual	76.683	13	5.899		
	Total	325.136	14			
2	Regression	280.979	2	140.489	38.179	.000[b]
	Residual	44.157	12	3.680		
	Total	325.136	14			
3	Regression	297.248	3 (ndf)	99.083	39.081	.000[c]
	Residual	27.888	11 (ddf)	2.535		
	Total	325.136	14			

Same as $df = (n-(k+1))$

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
1	(Constant)	63.474	2.557		24.827	.000	57.951	68.998
	Number of bedrooms	3.548	.547	.874	6.490	.000	2.367	4.729
2	(Constant)	54.267	3.697		14.678	.000	46.211	62.322
	Number of bedrooms	2.433	.572	.599	4.254	.001	1.187	3.679
	Size of Dwelling (thousands of square feet)	8.581	2.886	.419	2.973	.012	2.293	14.870
3	(Constant) b_0	60.988	4.057		15.033	.000	52.059	69.918
	Number of bedrooms b_2	1.800	.537	.443	3.354	.006	.619	$\leq b_2 \leq$ 2.981
	Size of Dwelling (thousands of square feet) b_1	7.024	2.473	.343	2.840	.016	1.580	$\leq b_1 \leq$ 12.468
	Age (Years) b_3	-.176	.069	-.309	-2.533	.028	-.329	$\leq b_3 \leq$ -.023

a. Dependent Variable: Assessed value ($000)

Confidence interval for pop. slope for each variables

Which variable make significant contribution to model?

SPSS Output

$\hat{y}$ — ε $y-\hat{y}$ — Average — individual

Y	X1	X2	X3	PRE_1	RES_1	LMCI_1	UMCI_1	LICI_1	UICI_1
84.4	2	3.42	6	85.23446	-0.83446	83.43472	87.03419	81.2948	89.17411
77.4	1.71	11.5	4	78.17756	-0.77756	76.92673	79.42838	74.45648	81.89863
75.7	1.45	8.33	4	76.90848	-1.20848	75.59484	78.22212	73.16583	80.65114
85.9	1.76	0	5	82.35001	3.54999	81.12823	83.57179	78.6386	86.06142
79.1	1.93	7.42	4	80.44005	-1.34005	78.39786	82.48225	76.3839	84.4962
70.4	1.2	32	3	69.19198	1.208025	66.09466	72.28929	64.51488	73.86907
75.8	1.55	16	4	76.26269	-0.46269	74.89865	77.62673	72.50204	80.02333
85.9	1.93	2	6	84.99237	0.907634	83.42137	86.56337	81.15181	88.83292
78.5	1.59	1.75	5	80.84829	-2.34829	79.47286	82.22371	77.0835	84.61307
79.2	1.5	2.75	4	78.24053	0.959468	76.61309	79.86798	74.37655	82.10452
86.7	1.9	0	7	86.933	-0.233	84.66686	89.19914	82.7596	91.10639
79.3	1.39	0	5	79.75106	-0.45106	77.40823	82.09389	75.53553	83.96659
74.5	1.54	12.58	3	74.9938	-0.4938	73.41843	76.56918	71.15146	78.83615
83.8	1.89	2.75	5	82.77977	1.020234	81.45859	84.10095	79.03446	86.52507
76.8	1.59	7.17	3	76.29597	0.504028	74.39314	78.19881	72.30817	80.28378

Note: y= assessed value (in thousands of dollars),X1= size of houses (thousands of square Feet), X2=age of the house (years) and X3=number of bedrooms

$\hat{y} = b_0 + b_1 x_1 + b_2 x_2 \cdots$ (constant)

Multi Regression

Linear Regression: Input chart
X → list 1 // Y → list 2
GRPH → SET → GRPH 1 → Calc → X → a+bx

residual error = $y - \hat{y}$

r = Correlation Coefficient: Strength and direction of linear relationship

r^2 = Coefficient of determination: proportion of var. in Y explained by X

Is there significant relationship btw X, Y?
Test → t → Reg | $H_0: \beta_1 = 0$ (no relation) $H_a: \beta_1 \neq 0$ (relation)
β_1 = slope

t-crit
$df = n-2$
area = $\alpha/2$ (difference → 2 tailed)

Chi proportions
test – chi – 2way – Mat
m: = n: 111
Dist – Chi – InvC
area = α
$df = (row-1)(col-1)$

$S_b = b / t_{calc}$ Confid. interval estimate
$t_{\alpha/2}$
$b_1 - t_{\alpha/2} S_b \leq \beta_1 \leq b_1 + t_{\alpha/2} S_b$