

```

REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT sales
/METHOD=ENTER adverts airplay .

```

## Regression : "SIMULTANEOUS" REGRESSION for Record Sales data

### Notes

Output Created		02-OCT-2007 22:10:27
Comments		
Input	Data	C:\Docs Setup\Courses & curric\stats\2007\Class notes\4 -Sept 28 -Regr Intro\Record2.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	200
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable
Weight Handling		
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT sales /METHOD=ENTER adverts airplay .
Resources	Processor Time	0:00:00.03
	Elapsed Time	0:00:00.05
	Memory Required	1724 bytes
	Additional Memory Required for Residual Plots	0 bytes

[DataSet2] C:\Docs Setup\Courses & curric\stats\2007\Class notes\4 -Sept 28 -Regr Intro\Record2.sav

### Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
1	No. of plays on Radio 1 per week, Advertisgg Budget (thousands of pounds)	.	Enter

a. All requested variables entered.

b. Dependent Variable: Record Sales (thousands)

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.793 <sup>a</sup>	<b>.629</b>	.626	49.38340

a. Predictors: (Constant), No. of plays on Radio 1 per week, Advertsing Budget (thousands of pounds)

### ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	815524.122	2	407762.061	167.203	.000 <sup>a</sup>
	Residual	480427.878	197	2438.720		
	Total	1295952.0	199			

a. Predictors: (Constant), No. of plays on Radio 1 per week, Advertsing Budget (thousands of pounds)

b. Dependent Variable: Record Sales (thousands)

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	41.124	9.331		4.407	.000
	Advertsing Budget (thousands of pounds)	.087	.007	<b>.523</b>	<b>11.991</b>	<b>.000</b>
	No. of plays on Radio 1 per week	3.589	.287	<b>.546</b>	<b>12.513</b>	<b>.000</b>

a. Dependent Variable: Record Sales (thousands)

```

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT sales
  /METHOD=ENTER adverts /METHOD=ENTER airplay .

```

**Regression: "HIERARCHICAL" REGRESSION with Ad Budget entered first ...**

## Notes

Output Created		02-OCT-2007 22:14:56
Comments		
Input	Data	C:\Docs Setup\Courses & curric\stats\2007\Class notes\4 -Sept 28 -Regr Intro\Record2.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	200
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable
Weight Handling		
Syntax	REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT sales /METHOD=ENTER adverts /METHOD=ENTER airplay .	
Resources	Processor Time	0:00:00.00
	Elapsed Time	0:00:00.00
	Memory Required	1780 bytes
	Additional Memory Required for Residual Plots	0 bytes

[DataSet2] C:\Docs Setup\Courses & curric\stats\2007\Class notes\4 -Sept 28 -Regr Intro\Record2.sav

### Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
1	Advertising Budget (thousands of pounds)	.	Enter
2	No. of plays on Radio 1 per week <sup>a</sup>	.	Enter

a. All requested variables entered.

b. Dependent Variable: Record Sales (thousands)

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.578 <sup>a</sup>	<b>.335</b>	.331	65.99144
2	.793 <sup>b</sup>	<b>.629</b>	.626	49.38340

### Model Summary

Model	Change Statistics				
	R Square Change	F Change	df1	df2	Sig. F Change
1	<b>.335</b>	99.587	1	198	.000
2	<b>.295</b>	156.572	1	197	.000

a. Predictors: (Constant), Advertising Budget (thousands of pounds)

b. Predictors: (Constant), Advertising Budget (thousands of pounds), No. of plays on Radio 1 per week

**THE R Squared TERMS ARE THE EFFECT SIZES.**

**WHEN A VARIABLE IS THE LAST PREDICTOR ENTERED, THE R Squared CHANGE TELLS US THE SIZE OF THE UNIQUE VARIANCE FOR THAT PREDICTOR. The unique effect for Airtime is 30% of the variance in Record Sales.**

### ANOVA<sup>c</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	433687.833	1	433687.833	99.587	.000 <sup>a</sup>
	Residual	862264.167	198	4354.870		
	Total	1295952.0	199			
2	Regression	815524.122	2	407762.061	167.203	.000 <sup>b</sup>
	Residual	480427.878	197	2438.720		
	Total	1295952.0	199			

a. Predictors: (Constant), Advertising Budget (thousands of pounds)

b. Predictors: (Constant), Advertising Budget (thousands of pounds), No. of plays on Radio 1 per week

c. Dependent Variable: Record Sales (thousands)

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	134.140	7.537		17.799	.000
	Advertsing Budget (thousands of pounds)	.096	.010	.578	9.979	.000
	No. of plays on Radio 1 per week					
2	(Constant)	41.124	9.331		4.407	.000
	Advertsing Budget (thousands of pounds)	.087	.007	.523	11.991	.000
	No. of plays on Radio 1 per week	3.589	.287	.546	12.513	.000

a. Dependent Variable: Record Sales (thousands)

**NOTE: MODEL 2 IN THIS SEQUENCE IS THE SIMULTANEOUS REGRESSION CALULATED ABOVE.**

### Excluded Variables<sup>b</sup>

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	No. of plays on Radio 1 per week	.546 <sup>a</sup>	12.513	.000	.665	.990

a. Predictors in the Model: (Constant), Advertsing Budget (thousands of pounds)

b. Dependent Variable: Record Sales (thousands)

### REGRESSION

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/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA CHANGE
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT sales
/METHOD=ENTER airplay /METHOD=ENTER adverts .

```

**Regression: SECOND ROUND OF HIERARCHICAL REGRESSION EQUATIONS USED FOR FOR COMPARISONS**

## Notes

Output Created		02-OCT-2007 22:22:25
Comments		
Input	Data	C:\Docs Setup\Courses & curric\stats\2007\Class notes\4 -Sept 28 -Regr Intro\Record2.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	200
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable
Weight Handling		
Syntax	REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT sales /METHOD=ENTER airplay /METHOD=ENTER adverts .	
Resources	Processor Time	0:00:00.00
	Elapsed Time	0:00:00.00
	Memory Required	1780 bytes
	Additional Memory Required for Residual Plots	0 bytes

[DataSet2] C:\Docs Setup\Courses & curric\stats\2007\Class notes\4 -Sept 28 -Regr Intro\Record2.sav

### Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
1	No. of plays on Radio 1 per week <sup>a</sup>	.	Enter
2	Advertsing Budget (thousands of pounds) <sup>a</sup>	.	Enter

a. All requested variables entered.

b. Dependent Variable: Record Sales (thousands)

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.599 <sup>a</sup>	<b>.359</b>	.355	64.78750
2	.793 <sup>b</sup>	<b>.629</b>	.626	49.38340

**Model Summary**

Model	Change Statistics				
	R Square Change	F Change	df1	df2	Sig. F Change
1	<b>.359</b>	110.750	1	198	.000
2	<b>.271</b>	143.789	1	197	.000

a. Predictors: (Constant), No. of plays on Radio 1 per week

b. Predictors: (Constant), No. of plays on Radio 1 per week, Advertsing Budget (thousands of pounds)

**THIS SECOND ROUND ENTERS THE TWO PREDICTORS IN REVERSE ORDER. FROM THIS TABLE, WE CAN SEE THAT THE UNIQUE VARIANCE ASSOCIATED WITH ADVERTISING BUDGET IS 27%.**

**ANOVA<sup>c</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	464862.811	1	464862.811	110.750	.000 <sup>a</sup>
	Residual	831089.189	198	4197.420		
	Total	1295952.0	199			
2	Regression	815524.122	2	407762.061	167.203	.000 <sup>b</sup>
	Residual	480427.878	197	2438.720		
	Total	1295952.0	199			

a. Predictors: (Constant), No. of plays on Radio 1 per week

b. Predictors: (Constant), No. of plays on Radio 1 per week, Advertsing Budget (thousands of pounds)

c. Dependent Variable: Record Sales (thousands)

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	84.873	11.267		7.533	.000
	No. of plays on Radio 1 per week	3.939	.374	.599	10.524	.000
	Advertsing Budget (thousands of pounds)					
2	(Constant)	41.124	9.331		4.407	.000
	No. of plays on Radio 1 per week	3.589	.287	.546	12.513	.000
	Advertsing Budget (thousands of pounds)	.087	.007	.523	11.991	.000

a. Dependent Variable: Record Sales (thousands)

### Excluded Variables<sup>b</sup>

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Advertsing Budget (thousands of pounds)	.523 <sup>a</sup>	11.991	.000	.650	.990

a. Predictors in the Model: (Constant), No. of plays on Radio 1 per week

b. Dependent Variable: Record Sales (thousands)