

## Ch7 Ex1: Prediction of University Grades (*univ*)

High School Grades (*hs*), Cognitive Ability (*abil*), and Study Skills (*stdy*)

**CORR univ hs abil stdy /STAT = DESCR.**

	Mean	Std. Deviation	N
univ	65.72	7.444	36
hs	63.69	8.645	36
abil	98.89	13.382	36
stdy	20.42	5.056	36

	univ	hs	abil
hs	.360 .031		
abil	.180 .292	.174 .310	
stdy	.316 .060	.470 .004	-.564 .000

**REGRESS /DEP = univ /ENTER hs abil stdy /SAVE PRED(prdu.has) RESID(resu.has).**

Model	R	R Square	Adjusted R Square
1	.538	.289	.222

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	560.566	3	186.855	4.337	.011
	Residual	1378.656	32	43.083		
	Total	1939.222	35			

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	18.180	13.832			1.314	.198
	hs	-.034	.182	-.039		-.186	.854
	abil	.306	.126	.551		2.438	.021
	stdy	.950	.371	.645		2.558	.015

	Mean	Std. Deviation	N
Predicted Value	65.72	4.002	36
Residual	.000	6.276	36

VARI LABEL prdu.has '' resu.has ''.  
 CORR univ hs abil stdy prdu.has resu.has.

	univ	hs	abil	stdy	prdu.has
prdu.has	.538	.669	.336	.588	1
resu.has	.843	.000	.000	.000	.000

REGRESS /STAT = DEFAU ZPP CHANGE /DEP = univ /ENTER abil stdy /ENTER hs.

Model	R	R Square	Change Statistics				
			R Square Change	F Change	df1	df2	Sig. F Change
1	.537	.288	.288	6.684	2	33	.004
2	.538	.289	.001	.035	1	32	.854

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	559.079	2	279.540	6.684	.004
	Residual	1380.143	33	41.823		
	Total	1939.222	35			
2	Regression	560.566	3	186.855	4.337	.011
	Residual	1378.656	32	43.083		
	Total	1939.222	35			

Model		Unstandardized Coefficients				Correlations		
		B	Std. Error	t	Sig.	Zero-order	Partial	Part
1	(Constant)	18.400	13.578	1.355	.185			
	abil	.292	.099	2.956	.006	.180	.458	.434
	stdy	.902	.262	3.444	.002	.316	.514	.506
2	(Constant)	18.180	13.832	1.314	.198			
	abil	.306	.126	2.438	.021	.180	.396	.363
	stdy	.950	.371	2.558	.015	.316	.412	.381
	hs	-.034	.182	-.186	.854	.360	-.033	-.028

REGRESS /DEP = hs /ENTER abil stdy /SAVE RESID(resh.as).

Model	R	R Square
1	.709	.503

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1315.970	2	657.985	16.707	.000
	Residual	1299.669	33	39.384		
	Total	2615.639	35			

VARI LABEL resh.as ''.

CORR resh.as WITH univ abil stdy.

	univ	abil	stdy
resh.as	-.028	.000	.000

REGRESS /DEP = univ /ENTER abil stdy /SAVE RESID(resu.as).

Model	R	R Square
1	.537	.288

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	559.079	2	279.540	6.684	.004
	Residual	1380.143	33	41.823		
	Total	1939.222	35			

VARI LABEL resu.as ''.

CORR resu.as WITH resh.as abil stdsy.

	resh.as	abil	stdy
resu.as	-.033	.000	.000

REGRE /VARI = univ abil stdy hs /DEP = univ /FORWARD.

Model	Variables Entered	Variables Removed	Method
1	hs	.	Forward (Criterion: Probability-of-F-to-enter <= .050)

Model	R	R Square
1	.360	.129

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	250.803	1	250.803	5.050	.031
	Residual	1688.419	34	49.659		
	Total	1939.222	35			

Model		Unstandardized Coefficients			
		B	Std. Error	t	Sig.
1	(Constant)	45.999	8.855	5.195	.000
	hs	.310	.138	2.247	.031

Model		Beta In	t	Sig.	Partial Correlation
1	abil	.121	.743	.463	.128
	stdy	.189	1.042	.305	.178

REGRE /VARI = univ abil stdy hs /DEP = univ /BACK.

Model	Variables Entered	Variables Removed	Method
1	hs, abil, stdy	.	Enter
2	.	hs	Backward (criterion: Probability of F-to-remove >= .100).

Model	R	R Square
1	.538	.289
2	.537	.288

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	560.566	3	186.855	4.337	.011
	Residual	1378.656	32	43.083		
	Total	1939.222	35			
2	Regression	559.079	2	279.540	6.684	.004
	Residual	1380.143	33	41.823		
	Total	1939.222	35			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.180	13.832		1.314	.198
	abil	.306	.126	.551	2.438	.021
	stdy	.950	.371	.645	2.558	.015
	hs	-.034	.182	-.039	-.186	.854
2	(Constant)	18.400	13.578		1.355	.185
	abil	.292	.099	.526	2.956	.006
	stdy	.902	.262	.612	3.444	.002

Model		Beta In	t	Sig.	Partial Correlation
2	hs	-.039	-.186	.854	-.033

REGRE /VARI = univ abil stdy hs /CRITER = PIN(.31) POUT(.35) /DEP = univ /STEP WISE.

Model	Variables Entered	Variables Removed	Method
1	hs	.	Stepwise (Criteria: Probability-of-F-to-enter <= .310, Probability-of-F-to-remove >= .350).
2	stdy	.	
3	abil	.	
4	.	hs	

Model	R	R Square
1	.360	.129
2	.396	.157
3	.538	.289
4	.537	.288

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	250.803	1	250.803	5.050	.031
	Residual	1688.419	34	49.659		
	Total	1939.222	35			
2	Regression	304.582	2	152.291	3.074	.060
	Residual	1634.640	33	49.535		
	Total	1939.222	35			
3	Regression	560.566	3	186.855	4.337	.011
	Residual	1378.656	32	43.083		
	Total	1939.222	35			
4	Regression	559.079	2	279.540	6.684	.004
	Residual	1380.143	33	41.823		
	Total	1939.222	35			

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	45.999	8.855		5.195	.000
	hs	.310	.138	.360	2.247	.031
2	(Constant)	45.189	8.878		5.090	.000
	hs	.233	.156	.271	1.497	.144
	stdy	.278	.267	.189	1.042	.305
3	(Constant)	18.180	13.832		1.314	.198
	hs	-.034	.182	-.039	-.186	.854
	stdy	.950	.371	.645	2.558	.015
	abil	.306	.126	.551	2.438	.021
4	(Constant)	18.400	13.578		1.355	.185
	stdy	.902	.262	.612	3.444	.002
	abil	.292	.099	.526	2.956	.006

Model		Beta In	t	Sig.	Partial Correlation
1	abil	.121	.743	.463	.128
	stdy	.189	1.042	.305	.178
2	abil	.551	2.438	.021	.396
4	hs	-.039	-.186	.854	-.033

FORMAT prdu.has TO resu.as (F8.3).

LIST.

SUBJ	abil	stdy	hs	univ	prdu.has	resu.has	resh.as	resu.as
1	104	24	71	72	70.445	1.555	.079	1.553
2	83	22	66	64	62.278	1.722	6.657	1.497
3	89	30	72	64	71.512	-7.512	-1.226	-7.470
4	79	29	68	66	67.632	-1.632	.355	-1.644
5	90	20	55	65	62.896	2.104	-4.406	2.253
6	96	15	53	55	60.055	-5.055	-1.782	-4.994
7	102	22	60	69	68.304	.696	-7.242	.941
8	97	23	63	70	67.620	2.380	-3.587	2.501
9	100	21	60	59	66.742	-7.742	-4.987	-7.573
10	126	8	55	63	62.533	.467	-2.290	.544
11	100	15	67	68	60.807	7.193	10.555	6.836
12	94	20	72	56	63.547	-7.547	10.931	-7.917
13	96	17	69	51	61.413	-10.413	11.371	-10.797
14	69	26	50	59	62.328	-3.328	-9.216	-3.016
15	113	16	57	66	66.079	-.079	-6.274	.133
16	110	16	58	62	65.126	-3.126	-4.026	-2.990
17	103	17	56	69	63.998	5.002	-4.540	5.156

18	105	15	69	55	62.272	-7.272	10.476	-7.626
19	92	27	71	74	69.616	4.384	.798	4.357
20	127	19	73	71	72.677	-1.677	-.365	-1.665
21	117	16	67	67	66.967	.033	2.063	-.036
22	96	23	63	59	67.314	-8.314	-3.171	-8.206
23	87	13	50	61	55.498	5.502	1.807	5.441
24	75	30	70	63	67.289	-4.289	2.595	-4.376
25	118	13	53	58	64.898	-6.898	-8.082	-6.624
26	97	20	62	67	64.805	2.195	-.316	2.206
27	91	22	74	69	64.460	4.540	11.331	4.157
28	98	25	74	84	69.454	14.546	4.150	14.406
29	104	21	68	73	67.697	5.303	1.350	5.257
30	92	22	59	56	65.273	-9.273	-4.084	-9.135
31	85	18	47	77	59.735	17.265	-7.480	17.518
32	113	16	64	65	65.842	-.842	.726	-.867
33	97	23	60	67	67.722	-.722	-6.587	-.499
34	91	22	55	67	65.102	1.898	-7.669	2.157
35	121	24	81	83	75.316	7.684	3.012	7.582
36	103	25	81	72	70.749	1.251	9.072	.944

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SET SEED = 987654321.
INPUT PROGRAM.
LOOP SUBJ = 1 TO 36.
COMP #z1 = NORM(1).
COMP #z2 = #z1*-.7071 + NORM(1)*.7071.
END CASE.
END LOOP.
END FILE.
END INPUT PROGRAM.
COMP abil = RND(100 + 15*#z1).
COMP stdy = RND( 20 + 5*#z2).
COMP hs   = RND(65+10*(#z1*.5 + #z2*.5 + NORM(1)*.7071)).
COMP univ = RND(65+10*(#z1*.5 + #z2*.5 + NORM(1)*.7071)).
FORMAT subj stdy hs univ (F2.0) abil (F3.0).

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