```
*Ch4 Ex2 12 Employees, Salary ($1,000s),
*          Education, Years Experience.
```

```
CORR sal edu yrs /STAT.
```

	Mean	Std. Deviation	N
sal	35.16	4.802	12
edu	12.50	2.541	12
yrs	21.75	4.115	12

		Y	
		sal	edu
X1	edu	.488	
		.107	
X2	yrs	.549	-.178
		.064	.579

$SS_Y = (12-1)4.8^2$

$b_{y1.2} = b_1 = \frac{.488 - .549 \times -.178}{1 - -.178^2} \times \frac{4.80}{2.54}$

≈ 1.144

$b_2 = .767$

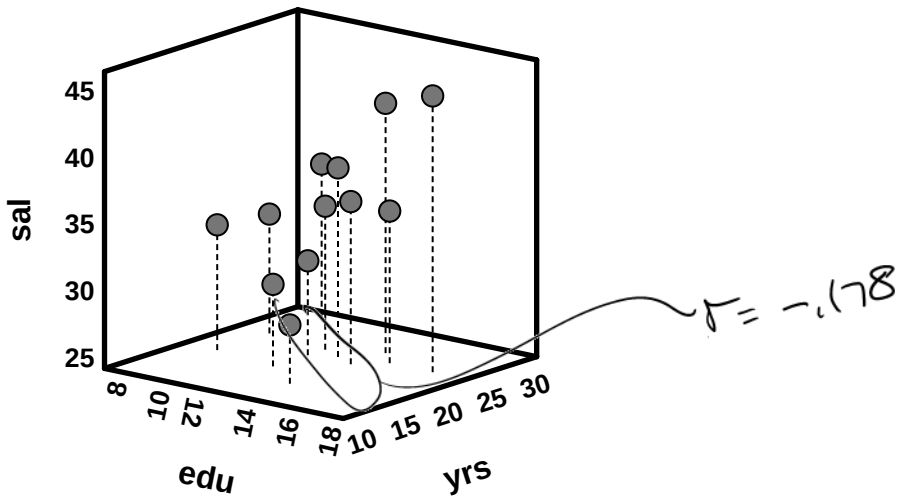
$b_0 = 35.16 - 1.144 \times 12.50 - .767 \times 21.75$

≈ 4.178

$\hat{Y} = b_0 + b_1 X_1 + b_2 X_2$

$= 4.178 + 1.144 X_1 + .767 X_2$

```
GRAPH  /SCATTERPLOT(XYZ)=yrs WITH sal WITH edu.
```



$r = -.178$

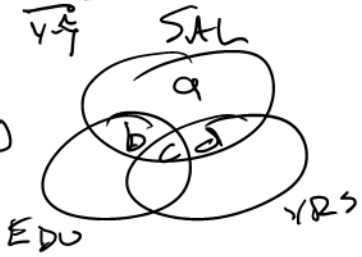
REGRESS /DEP = sal /ENTER edu yrs /SAVE PRED(prd) RESI(res).

Model	R	R Square
1	.810	.656

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	166.493	2	83.246	8.599	.008
	Residual	87.125	9	9.681		
	Total	253.618	11			

		Unstandardized Coefficients			
Model		B	Std. Error	t	Sig.
1	(Constant)	4.178	7.525	.555	.592
	edu	1.144	.375	3.049	.014
	yrs	.767	.232	3.310	.009

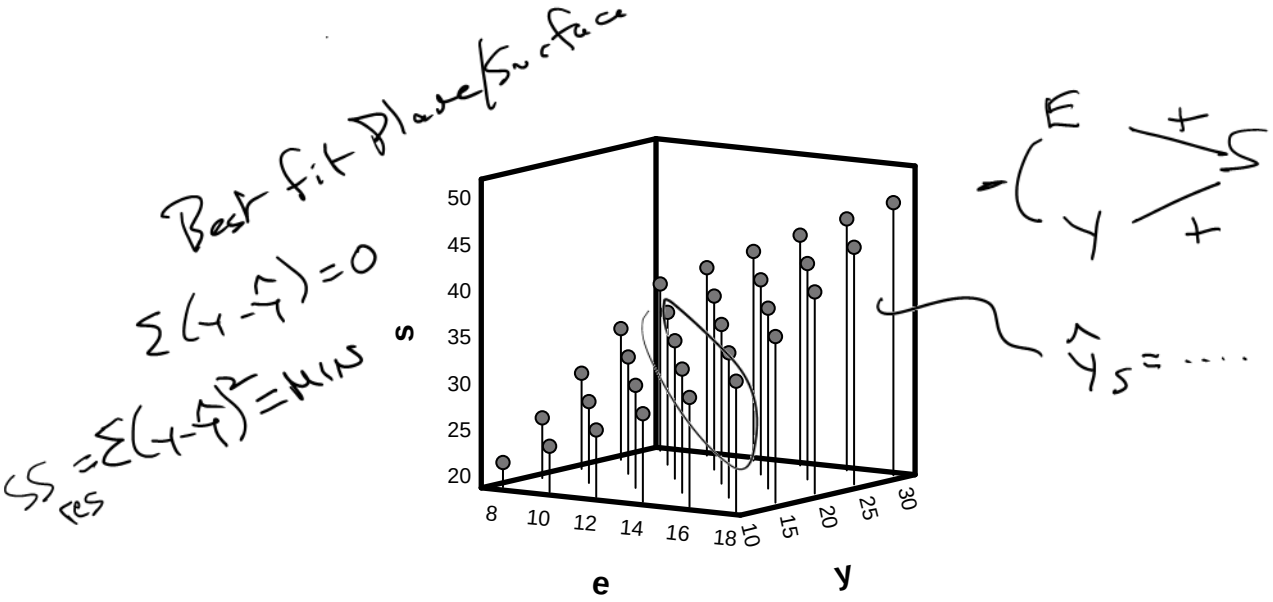
	Mean	Std. Deviation	N
Predicted Value	35.16	3.890	12
Residual	.000	2.814	12



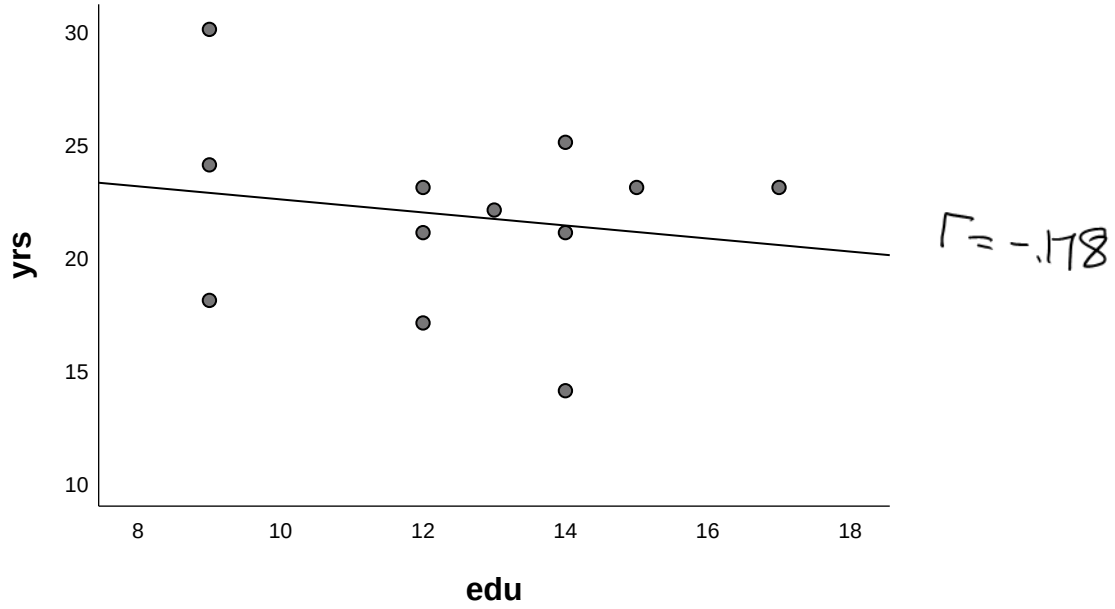
LIST.

o	yrs	edu	sal	prd	res
1	14	14	28	30.931	-2.640
2	25	14	43	39.367	3.229
3	21	14	36	36.299	-.229
4	22	13	38	35.922	2.127
5	21	12	31	34.011	-3.049
6	17	12	30	30.944	-.913
7	30	9	35	37.481	-2.160
8	23	15	35	38.977	-3.695
9	23	12	35	35.545	-.913
10	18	9	33	28.279	4.989
11	23	17	45	41.265	3.312
12	24	9	33	32.880	-.056

*See later commands to generate best-fit plane.



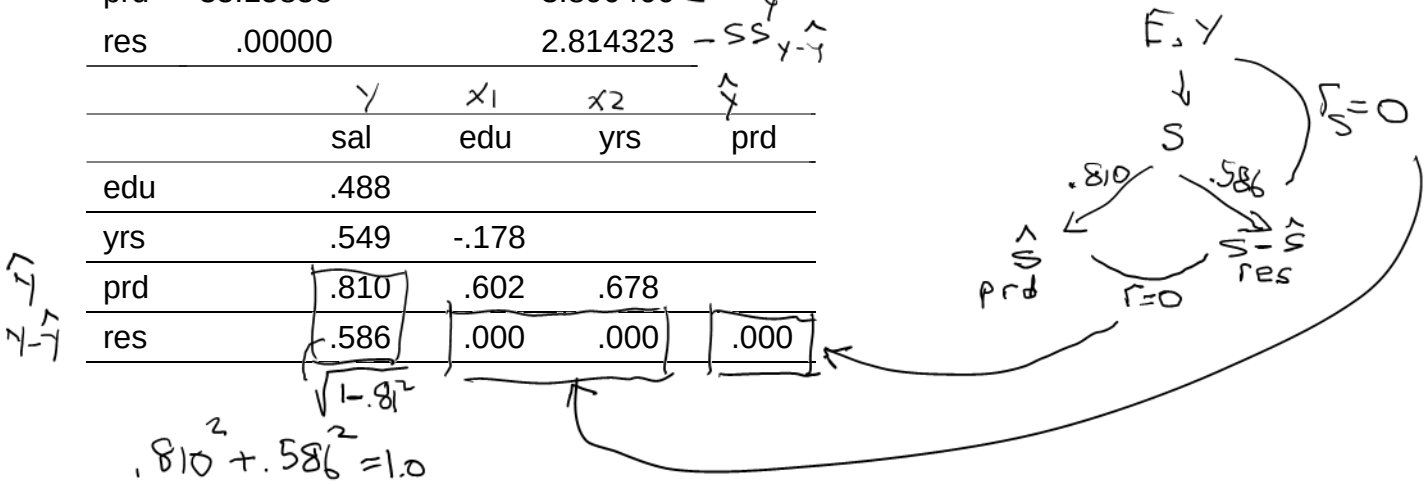

```
GRAPH  /SCATTERPLOT(BIVAR)=edu WITH yrs.
```



```
CORR sal edu yrs prd res /STAT /MISS = LIST.
```

	Mean	Std. Deviation
sal	35.15858	4.801681
edu	12.50	2.541
yrs	21.75	4.115
prd	35.15858	3.890466
res	.00000	2.814323

	sal	edu	yrs	prd
edu	.488			
yrs	.549	-.178		
prd	.810	.602	.678	
res	.586	.000	.000	.000



```
REGRESS /DEP = sal /ENTER yrs /ENTER edu.
```

Model	R	R Square
1	.549	.302
2	.810	.656

Model			Sum of Squares	df	Mean Square	F	Sig.
1	Regression	c+d	76.523	1	76.523	4.321	.064
	Residual	a+b	177.094	10	17.709		
	Total		253.618	11			
2	Regression	b+c+d	166.493	2	83.246	8.599	.008
	Residual	a	87.125	9	9.681		
	Total		253.618	11			

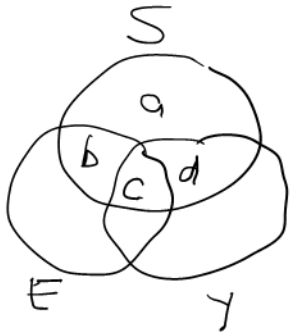
		Unstandardized Coefficients			
Model		B	Std. Error	t	Sig.
1	(Constant)	21.217	6.816	3.113	.011
	yrs	.641	.308	2.079	.064
2	(Constant)	4.178	7.525	.555	.592
	yrs	.767	.232	3.310	.009
	edu	1.144	.375	3.049	.014

ns alone

both Sig!

Education: $SS_{\hat{S}E \cdot Y}$ Unique $= (b+c+d) - (c+d) = b$

$= 166.493 - 76.523 = 89.97$



*Commands to generate data.
set seed = 545237172.
input program.
loop o = 1 to 12.
end case.
end loop.
end file.
end input program.

compute #u = rv.norm(0,1).
compute #x = #u*-.6 + rv.norm(0,1)*sqrt(1-.6**2).
compute #z = #u*.6 + rv.norm(0,1)*sqrt(1-.6**2).
compute #y = #z*.5 + #x*.5 + rv.norm(0,1)*.7071.

compute yrs = rnd(20 + #x*5).
compute edu = rnd(13 + #z*2.5).
compute sal = rnd(35000 + #y*5000)/1000.

format o yrs edu (f2.0) sal (f6.3).
LIST.

*Commands to generate best-fit plane.
INPUT PROGRAM.
LOOP y = 10 TO 30 BY 5.
LEAVE y.
LOOP e = 8 TO 18 BY 2.
END CASE.
END LOOP.
END LOOP.
END FILE.
END INPUT PROGRAM.

COMPUTE s = 4.178+.767*y+1.144*e.
GRAPH /SCATTERPLOT(XYZ)=y WITH s WITH e.