Ph.D. in Leadership and Policy
Niagara University
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ADS 805 – RESEARCH AND STATISTICS

Problem (SPSS) Set #3 (Measuring Significant Relationships)

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A survey of employees is conducted. Each employee provides the following information: Salary (SALARY), Years of Service (YOS), Sex (SEX), Job Classification (CLASSIFY), and Education Level (EDUC). Note that you will have to code SEX (Male = 1, Female = 2) and CLASSIFY (Clerical = 1, Technical = 2, Professional = 3), and indicate that they are measured on a nominal scale.

SALARY	YOS	SEX	CLASSIFY	EDUC
35,000	8	Male	Technical	14
18,000	4	Female	Clerical	10
20,000	1	Male	Professional	16
50,000	20	Female	Professional	16
38,000	6	Male	Professional	20
20,000	6	Female	Clerical	12
75,000	17	Male	Professional	20
40,000	4	Female	Technical	12
30,000	8	Male	Technical	14
22,000	15	Female	Clerical	12
23,000	16	Male	Clerical	12
45,000	2	Female	Professional	16

PROBLEM #1

Determine the value of the Pearson correlation coefficient for the relationship between salary and years of education and report your results with table(s). Pearson Correlation

A Pearson correlation coefficient was calculated for the relationship between participants' salary and years. A strong positive correlation was found (r (11) = .714, p < .001), indicating a significant linear relationship between the two variables. wealthier participants tend to have more year of education. Further, r squared (r^2) yielded a coefficient of determination of .51, indicating that 51% of the variance in the participants' year of education could be accounted for by the differences in their salary or vice versa.

Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
Salary	34666.67	16609.599	12
Edu	14.50	3.205	12

Table 2: Correlations

		Salary	Edu
Salary	Pearson Correlation	1	.714**
	Sig. (2-tailed)		.009
	N	12	12
Edu	Pearson Correlation	.714**	1
	Sig. (2-tailed)	.009	

**. Correlation is significant at the 0.01 level (2-tailed).

PROBLEM #2 simple liner regression

If we want to predict salary from years of education, what salary would you predict for someone with 12 years of education? What salary would you predict for someone with a college education (16 years?) Report your results with table(s).

A simple linear regression was calculated predicting employees' salary based on their years of education. A significant regression equation was found (F (1, 10) = 10.388, p < .01), with an r2 of .510. Employee' salary is equal to -18970.501+(3699.12) x12 (Years of education). Employees average salary would increase 3,699.12 of each year of education.

An employee with 12 years of education would have a predicted salary increase of $25,418.88 for each year in service.
An employee with 16 years of education would have a predicted salary increase of $40,215.34 for each year in service.

Table: 1 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.714[a]	.510	.460	12200.150

a. Predictors: (Constant), Edu

Table 2: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1546230088.496	1	1546230088.496	10.388	.009[b]
	Residual	1488436578.171	10	148843657.817		
	Total	3034666666.667	11			

a. Dependent Variable: Salary
b. Predictors: (Constant), Edu

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-18970.501	17010.145		-1.115	.291
	Edu	3699.115	1147.694	.714	3.223	.009

a. Dependent Variable: Salary

PROBLEM #3
Determine the prediction equation for predicting salary based on education, years of service, and sex. Which variables are significant predictors? If you believe that men were paid more than women were, what would you conclude after conducting this analysis? Report your results with table(s).

A multiple linear regression was calculated to predict participants' weight based on their height and sex. A significant regression equation was found (F (3, 8) = 5.208, p < .001), with an r^2 of .813. However only number of year of education is significant as the analysis does not support that men were paid more than women.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.813[a]	.661	.534	11334.164

a. Predictors: (Constant), Year of Service, Gender, Edu

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2006960462.542	3	668986820.847	5.208	.028[b]
	Residual	1027706204.124	8	128463275.516		
	Total	3034666666.667	11			

a. Dependent Variable: Salary

b. Predictors: (Constant), Year of Service, Gender, Edu

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-46257.655	25544.945		-1.811	.108
	Edu	4175.856	1232.166	.806	3.389	.010
	Gender	8856.781	7501.024	.278	1.181	.272
	Year of Service	795.054	538.159	.307	1.477	.178

a. Dependent Variable: Salary