



HOMEWORK ASSIGNMENT 6

ROSTER NO: 8

ACN 6312-003
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 Lab Date: 11/03/2016
 Due Date: 11/09/2016

Question 1

For this question, first perform all calculations by hand. You may then use SPSS to check your work. Please note any inconsistencies between the results you obtain by hand and those you obtain via SPSS. What might these differences, if any, have occurred? A researcher wants to examine whether a baby's weight at birth is associated with its heartrate at birth.

<i>Subject</i>	<i>Birthweight (in pounds)</i>	<i>Heartrate (BPM)</i>
1.	10	120
2.	7	90
3.	8	95
4.	11	125
5.	9	110

- a) What is the most appropriate statistical test to answer this question, and why?

Correlation is the most appropriate statistical test to examine the outcomes. We are using correlation because both variables are ratio / interval variables and we want to find the association between them.

- b) What are the dependent and independent variables?

Dependent Variable: Baby's weight

Independent Variable: Baby's Heartrate

- c) Perform the appropriate analysis by hand and show your work.

x	(x - \bar{x})	(x - \bar{x})²	y	(y - \bar{y})	(y - \bar{y})²	(y - \bar{y})(x - \bar{x})
10	1	1	120	12	144	12
7	-2	4	90	-18	324	36
8	-1	1	95	-13	169	13
11	2	4	125	17	289	34
9	0	0	110	2	4	0
$\Sigma = 45$		$\Sigma = 10$	$\Sigma = 540$		$\Sigma = 930$	$\Sigma = 95$

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} = \frac{45}{5} = 9$$

$$\bar{y} = \frac{\sum_{i=1}^n y_i}{n} = \frac{540}{5} = 108$$

$$S_x = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2} = \sqrt{\frac{SS}{n-1}} = \sqrt{\frac{10}{4}}$$

$$S_x = \mathbf{1.58}$$

$$S_y = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (y_i - \bar{y})^2} = \sqrt{\frac{SS}{n-1}} = \sqrt{\frac{930}{4}}$$

$$S_y = \mathbf{15.25}$$

$$cov(x, y) = \frac{\sum_{i=1}^n (x - \bar{x})(y - \bar{y})}{n-1} = \frac{95}{4}$$

$$\mathbf{cov(x, y) = 23.75}$$

$$r = \frac{cov_{xy}}{S_x S_y} = \frac{23.75}{1.58 * 15.25}$$

$$\mathbf{r = 0.99}$$

d) Report your findings in APA format.

A Pearsons correlational analysis revealed a significant correlation between babys weight at birth and baby's heartrate at birth, $r(4) = 0.985$, $p = .002$. Alpha = .01.

Question 2

A researcher recorded the number (in thousands) of ice cream carton sales from a supermarket for each month of the year, from 2008 through 2010. In addition, she recorded the number of fatal drowning that occurred during each of those months in her town. Use $\alpha = .05$.

- a) What is the most appropriate statistical test to answer this question, and why?

Correlation is the most appropriate statistical test to examine the outcomes. We are using correlation because both variables are ratio / interval variables and we want to find the association between them.

- b) What are the dependent and independent variables?

Dependent Variable: Number of Drowning

Independent Variable: Sale's Record

- c) Report your findings in APA format.

A Pearsons correlational analysis revealed a significant correlation between the sales record and number of drowning, $r(35) = .72$, $p < .001$. $\alpha = .05$.

Question 3

A panda enthusiast is interested in knowing if captive pandas have different eating habits (lbs. of bamboo eaten) based on the zoo they live in and their gender. Use $\alpha = .05$.

- a) What is the most appropriate statistical test to answer this question, and why?

A two-way ANOVA is the most appropriate statistical test to examine the data. We have one dependent variable eating habits of pandas (lbs. of bamboo eaten) and two independent variables location of zoo and gender. As we have more than one independent variable we have to choose the factorial ANOVA method.

- b) What are the dependent and independent variables?

Dependent Variable: Eating habits of pandas

Independent Variable: Location of zoo, gender

- c) Has the assumption of Homogeneity of variance been met? How did you come to this conclusion? (Note: make sure to report your evidence/test results correctly)

Levene's test of equality of Error variance indicated unequal variances for the present analysis, $F(7,12) = 3.511$, $p = 0.027$

- d) Report your findings in APA format.

A 2 x 4 (Gender[male, female] x Location[China, San Diego, Wash DC, Atlanta]) analysis of variance found that the overall model accounted for no significant amount of

variance on eating habits of pandas, $F(7, 12) = 2.412$, $p = 0.086$. In addition, although the analysis failed to find a significant main effect of Gender, $F(1, 12) = 0.247$, $p = .628$, there was a significant main effect of location of zoo, $F(3,12) = 4.448$, $p = 0.025$. Also there was no significant Gender x Location interaction effect on eating habits of pandas, $F(3, 12) = 0.543$, $p = 0.662$, Alpha = .05.

- e) Complete a post-hos analysis (Bonferroni) on the zoo/location variable. Report your results in APA format.

A one-way analysis of variance compared eating habits of pandas for four different locations[China, San Diego, Wash DC, Atlanta]. The effect of location on eating habits was significant, $F(3,12) = 4.448$, $p = 0.025$, and post-hoc tests performed using the Bonferroni method revealed that consumption of bamboos by pandas for China location significantly differ from Wash DC, ($p = .014$) but not with San Diego, ($p = 0.193$) and Atlanta, ($p = 0.415$). However, consumption of bamboos by pandas did not significantly differ between San Diego and Wash DC, ($p = 1$) and Atlanta, ($p=1$). Also consumption of bamboos by pandas did not significantly differ between Wash DC and Atlanta, ($p = 0.532$)

Attachments

Output graph of the data into SPSS.