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Formulas

$$r = \frac{\sum (Z_1 * Z_2)}{n}$$

$$\alpha = \frac{n r^2}{1 + (n - 1) r^2}$$

Warning! Warning! Warning! Warning! Warning! Warning!

Put your name on **every page** of this test. We will take the pages apart for grading, and if your name is missing, you may not get all the credit you deserve.

Make certain that you have **every page** of this test. If your copy is missing part of the test, you cannot possibly earn the entire 100 points! This test has 6 pages.

Each problem is followed by a point value for the problem. (#)

Part 1.

1. Provide a *brief* general description of the skew, kurtosis, and modality of the sketched distribution for var1. The values for the mean, skew, and kurtosis are given in the chart.

(3)



negative skewness, unimodal, mesokurtotic

Statistic	Var1
Mean	66.80
Std. Deviation	5.22
Skewness	-3.42
Kurtosis	0.82

2. An individual selected at random from the distribution above has a score of 67.3 on var1. Compute the Z score for that person. (3)

$$67.3 - 66.8 / 5.22 = .0957$$

3. What is the raw score for a person who has a Z score of - 0.73 on the distribution above? NOTE: $Z = -0.73$ (3)

$$-.75(5.22) + 66.8 = 62.989$$

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Below is a bivariate correlation matrix from our data file. The variables are described first.

Gender is scored 0 = males, 1 = females.

Higher scores on **busy** mean people report less free time and more involvement in projects or daily activities (i.e. higher scores are “busier” people).

Higher scores on aggression (**aggr**) mean people report more aggressive actions, but probably limited to verbal aggression (snippy remarks or an argument).

Relprac2 is the frequency people pray, have a spiritual experience, or practice their religion, so higher scores mean more religious practices.

		gender	busy	aggr	relprac2
gender	Pearson Correlation	1	.146(**)	-.143(*)	.104
	Sig. (2-tailed)		.004	.047	.149
	N	474	383	193	194
busy	Pearson Correlation	.146(**)	1	-.194(**)	.246(**)
	Sig. (2-tailed)	.004		.007	.001
	N	383	409	194	193
aggr	Pearson Correlation	-.143(*)	-.194(**)	1	-.021
	Sig. (2-tailed)	.047	.007		.773
	N	193	194	194	191
relprac2	Pearson Correlation	.104	.246(**)	-.021	1
	Sig. (2-tailed)	.149	.001	.773	
	N	194	193	191	194

4. Of the 6 non-perfect correlations between the four variables, how many are significant? (2)

Just write down a number between 0 and 6 4

5. Interpret and report in APA format one of the two significant correlations with gender. (4)

Women are busier than men ($r=.146, p<.01, n=383$)

Women are less aggressive than men ($r=-.143, p<.05, n =193$)

6. Interpret the correlation between busy and aggr and report the statistics in APA format. (4)

Increase busyness has a decreased aggression ($r=-.194, p<.01, n=194$)

7. List all of the non-perfect correlations in order of increasing magnitude. (3)

-.021, .0104, -.143, .146, -.194, .246

Part 2.

A high school class was assigned a “geo-caching” task, where each team of two students used a GPS device (which give latitude and longitude readings) to locate caches hidden somewhere on the school campus. One cache was relatively easy to find, the other was extremely difficult to find. Each team could find either 0, 1, or 2 of the caches. Below is the frequency of the number of caches found by all the teams in the class. Use the frequency to answer the questions below.

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of caches found

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3	18.8	18.8	18.8
	1	10	62.5	62.5	81.3
	2	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

1. How many teams participated in the activity? 16 (2)

2. Calculate the mean # of caches found.(4)

$$10(1) + 2(3) / 16 = 16/16 = 1$$

3. What is the median # of caches found? 1 (4)

4. What is the modal # of caches found? 1 (4)

5. Calculate the variance and standard deviation of the # of caches found. (6)

$$3(0-1)^2 + 10(1-1)^2 + 3(2-1)^2 / 16 = 3 + 3/16 = 6/16 = 3/8 = .375$$

$$SD = \sqrt{3/8} = .61$$

6. Display # of caches found in a frequency histogram. (4)

7. A researcher wants to make a composite measure of the four items below and use it as a scale to index his construct. Answer the questions below.

N = 125	Item1	Item2	Item3
Item1	-		
Item2	.397	-	
Item3	.371	.368	-
Item4	.211	.237	.295

8. Using Spearman Brown, calculate the alpha for a scale of the 4 items shown using the correlation matrix given: (7)

$$= 4(.3137) / 1 + (3)(.313) = .646$$

$$r_a = .397 + .391 + .368 + .211 + .237 + .295 / 6 = .313$$

9. I don't expect you to remember the table of alpha values from lab, but how reliable would you say this scale is? Is it a very reliable measure, or adequate, or pretty unreliable? (2)

adequate

10. Extra credit: Would the scale be more reliable without item 4? Calculate the alpha that would answer that question and then answer it. (up to 4 points)

$$r_a = .379 = 3(.38) / 1 + 2(.38) = .647$$