EDL 7510 - Test 2
SPRING 2014                           Name: Nasser Al Mufarji


Use the following information to answer questions 1-4:  **SHOW YOUR WORK!**


A test has a raw score mean of 140 and a standard deviation of 20.

1.  Frieda Livery obtained a raw score of 126. What is her Z score?   (1 pt.)

   X= 126        mean = 140             std deviation =20

   Z= $\frac{126-140}{20}$ = -14/20 = **-0.7**


   Interpret her Z score.  (1 pt.)

   0.7 standard deviations below the mean



2.  Art E. Choke obtained a raw score of 172.  What is his Z score?   (1 pt.)

   Z= $\frac{172-140}{20}$ = 32/20= **1.6**



   Interpret his Z score.  (1 pt.)

   1.6 standard deviations above the mean



3.  Ruth Less obtained a Z score of -1.3. What is her raw score?  (2 pt.)

   Z= -1.3     std deviation=20        mean =140

X= -1.3x20 = -26       140+(-26)=114          **X=114**

4. Sal U. Tashun obtained a Z score of 2.1. What is his raw score? (2 pt.)

Z=2.1    std deviation=20    mean=140    X?

X=2.1x20=42    140+42=182  **X=182**

The following statistics were obtained by the prominent researcher, Di A. Graham. Use these to help answer questions 5-9.

$r_A = -.92$        $r_B = .87$        $r_C = .49$        $r_D = -.03$

5. The best prediction would be made using which one of the above correlations? (1 pt.)

**$r_A = -.92$**

6. For which correlation above would we have a scatter diagram that is nearest to being a circle? (1 pt.)

**$r_D = -.03$**

7. A low score on one variable would most likely correspond to a low score on the other variable using which one of the above correlations? (1 pt.)

**$r_D = -.03$**

8. Which correlation is most likely to be "statistically significant"? (1 pt.)

**$r_A = -.92$**

9. A high score on one variable would most likely correspond to a high score on the other variable using which one of the above correlations? (1 pt.)

   $r_A$ = **-.92**

Raifer Ourside obtained the following two sets of raw scores from 10 cheerleaders:

| X | Y |
|---|---|
| 21 | 31 |
| 6 | 9 |
| 19 | 23 |
| 18 | 20 |
| 5 | 11 |
| 7 | 12 |
| 13 | 16 |
| 9 | 16 |
| 16 | 18 |
| 16 | 14 |

10. a. Calculate the Pearson Product-Moment Correlation Coefficient? (10 pts.)

**[SHOW YOUR WORK!]**

r = <u>0.86</u>

**Pearson Product-moment Correlation Coefficient**

| X | Y | x | y | xy | x2 | y2 | xy | | 304 |
|---|---|---|---|----|-----|-----|-----|---|-----|
| 21 | 31 | 8 | 14 | 112 | 64 | 196 | | | <u>-9</u> |
| 6 | 9 | -7 | -8 | 56 | 49 | 64 | | | <u>295</u> |
| 19 | 23 | 6 | 6 | 36 | 36 | 36 | | | |
| 18 | 20 | 5 | 3 | 15 | 25 | 9 | x | | 25 |
| 5 | 11 | -8 | -6 | 48 | 64 | 36 | | | <u>-25</u> |
| 7 | 12 | -6 | -5 | 30 | 36 | 25 | | | 0 |
| 13 | 16 | 0 | -1 | 0 | 0 | 1 | y | | 24 |
| 9 | 16 | -4 | -1 | 4 | 16 | 1 | | | <u>-24</u> |
| 16 | 18 | 3 | 1 | 3 | 9 | 1 | | | 0 |
| 16 | 14 | 3 | -3 | -9 | 9 | 9 | | | |
| **130** | **170** | **0** | **0** | **295** | **308** | **378** | | | |

mean = 130/10 = 13
mean = 170/10 = 17


standard deviation
= square root of
308/10                                               **5.54**   for x
standard deviation =square root of 378/10            **6.14**   for y

r= 295/10(5.54)(6.14)
r=295/10(34.01)
r=295/340.15
**r=0.86**


b.  Construct a scatter diagram    (5 pts.)

| X | Y |
|---|---|
| 21 | 31 |
| 6 | 9 |
| 19 | 23 |
| 18 | 20 |
| 5 | 11 |
| 7 | 12 |
| 13 | 16 |
| 9 | 16 |
| 16 | 18 |
| 16 | 14 |
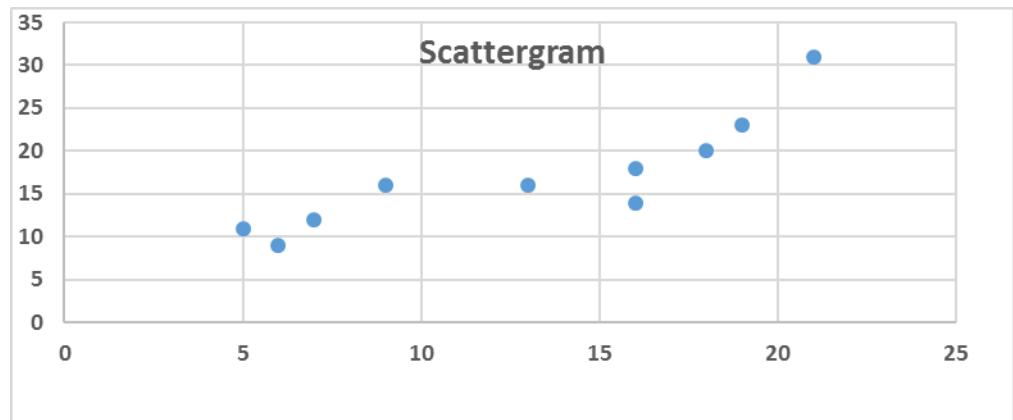
11. A test has a reliability of .89.  How do you interpret this in terms of:

    a.  True score variance (1 pt.)

        **0.89** of the total variance comes from true scores

    b.  Error variance (1 pt.)

        **0.11** of true score variance comes from error variance

12. If the test in #11 had a standard deviation of 10, what would be the standard error of measurement?  **(SHOW YOUR WORK)**  (4 pts.)

    Standard deviation= 10, error of variance=0.11, rtt=0.89

    SEM= Std deviation total multiply by square rootof 1-rtt

$$S_{measurement} = S_{test} \sqrt{1 - r_{test,test}}$$

                    10 square root of 1-0.89 = 10 square root of 0.11
                    =10(0.33) = 3.3

                                  **SEM=3.3**

13. If Ella Vate obtained a score of 83 on the above test, what would the 68% confidence interval be for her true score?  What would the 95% confidence interval be?
How are each of these confidence intervals interpreted?

    a.  68% Confidence interval: (83-3.3)± (83+3.3)=79.7 ± 86.3

    Interpretation: (1 pt.) True scores will be found between 79.7 and 86.3

b.  95% Confidence interval: (1 pt.) 83-2(3.3) + 83+2(303)=83-6.6 + 83+6.6=76.4 +  89.6

Interpretation:   (1 pt.) True scores will be found between 76.4 and 89.6

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14. A regression equation has the following probability from a printout:  PROB. = .4416.
    **USE THE .05 LEVEL.**

    a.  What is the null hypothesis? (1pt.)  **Ho: *p*=0**

    b.  What is your decision regarding the null hypothesis? (1pt.)  **Fail to reject Ho**

    c.  What is your conclusion? (1 pt.) **Due to chance**

    d.  Is this result statistically significant? (1 pt.) **Not statistically significant**

Use the following to help answer questions 15-21:

Two randomly selected groups of holiday shoppers were chosen for a research study. One group received training in stress relief; the other group was the control group and received no training. After the two week training program ended, the means of the two groups were compared – Group 1 receiving the training – Group 2 was the control. It was hypothesized that the mean of Group 1 would be greater than the mean of Group 2.

The following t probability was obtained from a printout: PROB. = .0720.

**USE THE .05 LEVEL**

15. What is the research hypothesis? (1 pt.) __$U_1 > U_2$_____

16. What is the null hypothesis? (1 pt.) _____$U_1 = U_2$_____

17. Is this a one or two tail test? (1 pt.) _____one tailed test_____

18. Is the t-test independent or correlated? (1 pt.) __independent (two different groups)_____

19. What decision do you make concerning H$_O$? (1 pt.) **Reject Ho**

20. What is your conclusion? (1 pt.) **Not zero**

21. Is this a statistically significant difference? (1 pt.) **Yes, it is statistically significant**

Use the following to help answer questions 22-28:

Fifteen department store Santas were administered the ($H_O$-$H_O$-$H_O$) Laughter Scale at the beginning of the shopping season. At the end of the season they were given the scale again. It was hypothesized that their mean score would be different the second time.

The following t probability was obtained from a printout: PROB. = .1000.

### USE THE .05 LEVEL

22. What is the research hypothesis? (1 pt.) $M_1 \neq M_2 \neq M_3 \neq M_4 \ldots\ldots\ldots M_{15}$

23. What is the null hypothesis? (1 pt.) $M_1 = M_2 = M_3 = M_{4=} \ldots\ldots\ldots M_{15}$

24. Is this a one or two tail test? (1 pt.) **One tailed test**

25. Is the t-test independent or correlated? (1 pt.) **Independent groups**

26. What decision do you make concerning $H_O$? (1 pt.) **Fail to reject Ho**

27. What is your conclusion? (1 pt.) **Due to chance**

28. Is this a statistically significant difference? (1 pt.) **Not statistically significant**

Use the following to help answer questions 29-32:

A questionnaire was sent by the well-known researcher, Clair Voyant, asking parents whether they thought their children had good control of emotions while playing computer games. The researcher compared those respondents who had children in public schools with those who homeschooled.

The following Chi Square probability was obtained from a printout: PROB. = .0081.

**USE THE .05 LEVEL**

29. What is $H_O$? (1 pt.) **Ho : fo=fe**

30. What decision would you make concerning $H_O$? (1 pt.) **Reject Ho**

31. What conclusion would you make? (1 pt.) **Not due to chance**

32. Is this a significant difference? (1 pt.) **Yes, statistically significant**