Test Bank

# Chapter 13: Correlation and Regression

## Multiple Choice

1. Which of the following hypothesis testing procedures assumes homoscedasticity?

A. independent samples *t*-tests

B. independent samples ANOVAs

C. Pearson correlation

D. All of these assume homoscedasticity.

Ans: C

Learning Objective: Assumption of homoscedasticity

2. Which of the following correlations is depicted in Graph 1? (left top)



A. .84

B. .62

C. −.63

D. −.98

Ans: D

Learning Objective: Interpreting a scatterplot

3. Which of the following correlations is depicted in Graph 2? (right top)



A. .84

B. .62

C. −.63

D. −.98

Ans: A

Learning Objective: Interpreting a scatterplot

4. Which of the following correlations is depicted in Graph 3? (left bottom)



A. .84

B. .62

C. −.63

D. −.98

Ans: C

Learning Objective: Interpreting a scatterplot

5. Which of the following correlations is depicted in Graph 4? (right bottom)



A. .84

B. .62

C. −.63

D. −.98

Ans: B

Learning Objective: Interpreting a scatterplot

6. A school counselor wondered if students had a more depressed mood as finals approach. Based on this observation, she wondered if there might a relationship between the students’ workload in a given month and their level of depressed mood. Specifically, she recorded the number of tests and quizzes eight students had in a given month and also assessed their levels of depressed mood at the end of the month. Higher numbers on the depression score indicate more depressed mood. Should this be a one-tailed or two-tailed test?

A. one tailed

B. two tailed

Ans: A

Learning Objective: One- or two-tailed test

7. A school counselor wondered if students had a more depressed mood as finals approach. Based on this observation, she wondered if there might a relationship between the students’ workload in a given month and their level of depressed mood. Specifically, she recorded the number of tests and quizzes eight students had in a given month and also assessed their levels of depressed mood at the end of the month. Higher numbers indicate more depressed mood. Which of the following is the best null hypothesis for this study?

A. There is no linear correlation betweennumber of tests/quizzes adnstudents’ depression score.

B. There is a negative correlaton between number of tests/quizzes and students’ depression score.

C. There is not a positive correlation between number of tests/quizzes and students depression score.

D. There is an association between number of tests/quizzes adnstudents’ depression score.

Ans: C

Learning Objective: One-tailed null hypothesis

8. A school counselor noticed that students seemed to have a more depressed mood as finals approach. Based on this observation, she wondered if there might a relationship between the students’ workload in a given month and their level of depressed mood. Specifically, she recorded the number of tests and quizzes eight students had in a given month and also assessed their levels of depressed mood at the end of the month. Higher numbers indicate more depressed mood. What is the critical value for this statistic using α of .05?

|  |  |  |
| --- | --- | --- |
| Student | Number of Tests and Quizzes (*X*) | Depressed Mood (*Y*) |
| A | 11 | 14 |
| B | 6 | 7 |
| C | 18 | 15 |
| D | 4 | 7 |
| E | 1 | 3 |
| F | 10 | 9 |
| G | 5 | 9 |
| H | 3 | 3 |
|  | *M*X = 7.25  *SD*X = 5.50  *SS*X = 211.5 | *M*Y = 8.38  *SD*Y = 4.44  *SS*Y = |

A. .669

B. .621

C. .707

D. .866

E. .786

Ans: B

Learning Objective: Locating critical region

9. A school counselor noticed that students seemed to have a more depressed mood as finals approach. Based on this observation, she wondered if there might a relationship between the students’ workload in a given month and their level of depressed mood. Specifically, she recorded the number of tests and quizzes eight students had in a given month and also assessed their levels of depressed mood at the end of the month. Higher numbers indicate more depressed mood. What is Pearson’s *r* for these data?

|  |  |  |
| --- | --- | --- |
| Student | Number of Tests and Quizzes (*X*) | Depressed Mood (*Y*) |
| A | 11 | 14 |
| B | 6 | 7 |
| C | 18 | 15 |
| D | 4 | 7 |
| E | 1 | 3 |
| F | 10 | 9 |
| G | 5 | 9 |
| H | 3 | 3 |
|  | *M*X = 7.25  *SD*X = 5.50  *SS*X = 211.5 | *M*Y = 8.38  *SD*Y = 4.44  *SS*Y = |

A. .91

B. .04

C. .16

D. .78

E. .64

F. .11

Ans: A

Learning Objective: Computing a Pearson’s *r*

10. A school counselor noticed that students seemed to have a more depressed mood as finals approach. Based on this observation, she wondered if there might a relationship between the students’ workload in a given month and their level of depressed mood. Specifically, she recorded the number of tests and quizzes eight students had in a given month and also assessed their levels of depressed mood at the end of the month. Higher numbers indicate more depressed mood. What is Pearson’s *r* for these data?

|  |  |  |
| --- | --- | --- |
| Student | Number of Tests and Quizzes (*X*) | Depressed Mood (*Y*) |
| A | 11 | 14 |
| B | 6 | 7 |
| C | 18 | 15 |
| D | 4 | 7 |
| E | 1 | 3 |
| F | 10 | 9 |
| G | 5 | 9 |
| H | 3 | 3 |
|  | *M*X = 7.25  *SD*X = 5.50  *SS*X = 211.5 | *M*Y = 8.38  *SD*Y = 4.44  *SS*Y = |

Which of the following statements best summarizes the data described above?

A. There is no relationship between workload and levels of depressed mood.

B. Higher workloads are associated with significantly greater depressed mood.

C. Lower workloads are associated with significantly greater depressed mood.

Ans: B

Learning Objective: Summarizing results

11. You should use a \_\_\_\_\_\_ correlation when one or more of the variables are measured on an ordinal scale.

A. Pearson

B. Spearman

C. Point biserial

D. Any of these are appropriate.

Ans: B

Learning Objective: Choosing correct correlation

12. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and how much they liked school (1= *I don’t like school at all* to 10 = *I really like school*). The researcher expected that these variables would be positively associated. The first step in this analysis is to create and examine a scatterplot of the following data because examining the scatterplot will:

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. help you determine the degrees of freedom and then the critical value

B help you determine if a person’s or spearman’s correlation is the best test statistic

C. reveal if the data independence assumption was met

D. reveal if the appropriate measurement assumption was met

Ans: B

Learning Objective: Reason for scatterplot

13. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and to complete a survey that yielded a higher score the more they liked school. The researcher expected that these variables would be positively associated. Which statistic is appropriate to determine if these two variables are associated?

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. Pearson, one tailed

B. Spearman, one tailed

C. Pearson, two tailed

D. Spearman, two tailed

Ans: A

Learning Objective: Choosing correct correlation

14. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and to complete a survey that yielded a higher score the more they liked school. The researcher expected that these variables would be positively associated. What is the null hypothesis of this study?

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. There is a positive correlation between number of books read and attitude toward school.

B. There is NOT a positive correlation between number of books read and attitude toward school.

C. There is an association between number of books read and attitude toward school.

D. There is NOT an association between number of books read and attitude toward school.

Ans: B

Learning Objective: One-tailed null hypothesis

15. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and to complete a survey that yielded a higher score the more they liked school. The researcher expected that these variables would be positively associated. What is the research hypothesis of this study?

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. There is a positive correlation between number of books read and attitude toward school.

B. There is NOT a positive correlation between number of books read and attitude toward school.

C. There is an association between number of books read and attitude toward school.

D. There is NOT an association between number of books read and attitude toward school.

Ans: A

Learning Objective: One-tailed research hypothesis

16. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and to complete a survey that yielded a higher score the more they liked school. The researcher expected that these variables would be positively associated. What is the critical value for this test? Use α = .05.

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. .576

B. .632

C. .497

D. .549

Ans: D

Learning Objective: Locating critical region

17. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and to complete a survey that yielded a higher score the more they liked school. The researcher expected that these variables would be positively associated. Compute the test statistic.

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. .777

B. .889

C. .601

D. .555

Ans: B

Learning Objective: Computing test statistic

18. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and to complete a survey that yielded a higher score the more they liked school. The researcher expected that these variables would be positively associated. Compute the effect size.

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. .604

B. .790

C. .361

D. .308

Ans: B

Learning Objective: Computing effect size

19. A researcher wanted to know if there was an association between the number of books a student reads during the summer and that student’s attitude toward school. The researcher asked 10 students who were entering the 6th grade how many book they read during the summer and to complete a survey that yielded a higher score the more they liked school. The researcher expected that these variables would be positively associated. Which of the following is the best summary of the relationship between these data?

|  |  |
| --- | --- |
| Number of Books Read During Summer | Attitude Toward School |
| 0 | 1 |
| 2 | 3 |
| 4 | 5 |
| 6 | 9 |
| 5 | 6 |
| 7 | 8 |
| 4 | 7 |
| 2 | 4 |
| 3 | 4 |
| 8 | 7 |

A. There is no significant association between number of books read and attitude toward school.

B. There is a significant association between number of books read and attitude toward school.

C. Students who read more books tended to have more favorable attitudes toward school.

D. Students who read more books tended to have less favorable attitudes toward school.

Ans: C

Learning Objective: Summarizing the results

20. A statistics instructor required students to complete a survey of their attitudes toward statistics prior to their taking an online statistics exam. After the students took the exam, he wanted to know if there was a significant association between the students’ attitude scores and their scores on the exam. He ran the correlation and found it to be *r*(48) = .21, *p* > .05. Based on these results are attitude scores a good predictor of students’ performance on the exam?

A. No, the relationship between homework points and exam score is too weak for homework points to be a good predictor.

B. No, the sample size is too small for homework points to be a good predictor of exam score.

C. Yes, the relationship between homework points and exam score is strong.

D. Yes, the sample size is over 30 so homework points is all but guaranteed to be a good predictor of exam score.

Ans: A

Learning Objective: Interpreting APA results

21. Which of the following correlations would result in the most accurate predictions using regression?

A. .55

B. .33

C. −.61

D. .38

Ans: C

Learning Objective: Interpreting correlation coefficients

22. Which of the following correlations would result in the most accurate predictions using regression?

A. .32

B. .38

C. .22

D. .05

Ans: B

Learning Objective: Interpreting correlation coefficients

23. A statistics instructor required students to complete 3 online homework assignments prior to their taking an online statistics exam. After the students took the exam, he wanted to create a regression equation to that used students total homework points to predict their scores on the exam. The SPSS output is below, what is the regression equation for this prediction?

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model Summary** | | | | | | | | | | | |
| Model | | *R* | *R*2 | | | Adjusted *R*2 | | | Std. Error of the Estimate | | |
| 1 | | .782a | .611 | | | .607 | | | 9.54699% | | |
| aPredictors: (Constant), PracTest2Total | | | | | | | | | | | |
| **ANOVAa** | | | | | | | | | | | | | | | | |
| Model | | | | Sum of Squares | | | *df* | | | Mean Square | | | *F* | | Sig. | |
| 1 | Regression | | | 13472.613 | | | 1 | | | 13472.613 | | | 147.815 | | .000b | |
| Residual | | | 8567.635 | | | 94 | | | 91.145 | | |  | |  | |
| Total | | | 22040.247 | | | 95 | | |  | | |  | |  | |
| aDependent Variable: Exam 2 [Total Pts: 54.5] |177369 | | | | | | | | | | | | | | | | |
| bPredictors: (Constant), PracTest2Total | | | | | | | | | | | | | | | | |
| **Coefficientsa** | | | | | | | | | | | | | | | | | |
| Model | | | | | Unstandardized Coefficients | | | | | | Standardized Coefficients | | | *t* | | Sig. | |
| *B* | | | Std. Error | | | β | | |
| 1 | (Constant) | | | | 28.140 | | | 4.210 | | |  | | | 6.684 | | .000 | |
| PracTest2Total | | | | .727 | | | .060 | | | .782 | | | 12.158 | | .000 | |
| aDependent Variable: Exam 2 [Total Pts: 54.5] |177369 | | | | | | | | | | | | | | | | | |

A. Y = .06 (X) + 4.21

B. Y = .727 (X) + 28.14

C. Y = .782 (X) + 28.14

D. Y = .727 (X) + 4.21

Ans: B

Learning Objective: Interpreting SPSS regression output

24. A statistics instructor required students to complete 3 online homework assignments prior to their taking an online statistics exam. After the students took the exam, he wanted to create a regression equation to that used students total homework points to predict their scores on the exam. The SPSS output is below, create a regression equation based on these data and then use it to predict the exam score of someone who earned 70 points on the homework assignments.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model Summary** | | | | | | | | | | | |
| Model | | *R* | *R*2 | | | Adjusted *R*2 | | | Std. Error of the Estimate | | |
| 1 | | .782a | .611 | | | .607 | | | 9.54699% | | |
| aPredictors: (Constant), PracTest2Total | | | | | | | | | | | |
| **ANOVAa** | | | | | | | | | | | | | | | | |
| Model | | | | Sum of Squares | | | *df* | | | Mean Square | | | *F* | | Sig. | |
| 1 | Regression | | | 13472.613 | | | 1 | | | 13472.613 | | | 147.815 | | .000b | |
| Residual | | | 8567.635 | | | 94 | | | 91.145 | | |  | |  | |
| Total | | | 22040.247 | | | 95 | | |  | | |  | |  | |
| aDependent Variable: Exam 2 [Total Pts: 54.5] |177369 | | | | | | | | | | | | | | | | |
| bPredictors: (Constant), PracTest2Total | | | | | | | | | | | | | | | | |
| **Coefficientsa** | | | | | | | | | | | | | | | | | |
| Model | | | | | Unstandardized Coefficients | | | | | | Standardized Coefficients | | | *t* | | Sig. | |
| *B* | | | Std. Error | | | β | | |
| 1 | (Constant) | | | | 28.140 | | | 4.210 | | |  | | | 6.684 | | .000 | |
| PracTest2Total | | | | .727 | | | .060 | | | .782 | | | 12.158 | | .000 | |
| aDependent Variable: Exam 2 [Total Pts: 54.5] |177369 | | | | | | | | | | | | | | | | | |

A. 8.41

B. 79.03

C. 82.88

D. 55.1

Ans: B

Learning Objective: Interpreting SPSS regression output

25. A grading assistant for an introductory statistics course wants to use students’ total points on the reading questions from Chapters 1 through 4 to predict their scores on an exam that covers Chapters 1 through 4. Use the information provided below to determine *b* for this regression formula needed to make this prediction.

|  |  |  |
| --- | --- | --- |
|  | Total Reading Question Points (*X*) | Exam Score (*Y*) |
| Mean | 98.0 | 83.92 |
| *SD* | 7.17 | 12.80 |

*r* = .585

What is *b* for this regression equation?

A. 0.33

B. 1.04

C. 0.50

D. 0.68

Ans: B

Learning Objective: Computing regression

26. A grading assistant for an introductory statistics course wants to use students’ total points on the reading questions from Chapters 1 through 4 to predict their scores on an exam that covers Chapters 1 through 4. Use the information provided below to determine a for this regression formula needed to make this prediction.

|  |  |  |
| --- | --- | --- |
|  | Total Reading Question Points (*X*) | Exam Score (*Y*) |
| Mean | 98.0 | 83.92 |
| *SD* | 7.17 | 12.80 |

What is a (the constant) for this regression equation?

A. 10.72

B. −18.39

C. .15.81

D. −21.1

Ans: B

Learning Objective: Computing regression

27. The correlation between the number of reading questions points students earn and their exam score is *r*(94) = .59, *p* < .01. Compute a 95% CI for this correlation.

A. UB = .881; LB = .475

B. UB = .71; LB = .44

C. UB = .79; LB = .39

D. UB = .66; LB = .38

Ans: B

Learning Objective: Computing CI for *r*

28. The correlation between the number of reading questions points students earn and their exam score is *r*(94) = .59, *p* < .01. Compute a 99% CI for this correlation.

A. UB = .95; LB = .41

B. UB = .74; LB = .39

C. UB = .79; LB = .39

D. UB = .66; LB = .38

Ans: B

Learning Objective: Computing CI for *r*

29. The correlation between two variables is *r*(58) = .44, *p* <.05. Compute a 95% CI for this correlation.

A. UB = .73; LB = .21

B. UB = .70; LB = .18

C. UB = .62; LB = .21

D. UB = .47; LB = .26

Ans: C

Learning Objective: Computing CI for *r*

30. The correlation between two variables is *r*(58) = .44, *p* <.05. Compute a 99% CI for this correlation.

A. UB = .81; LB = .13

B. UB = .70; LB = .18

C. UB = .67; LB = .13

D. UB = .47; LB = .26

Ans: C

Learning Objective: Computing CI for *r*

31. The population of junior high school boys’ height is normal distributed with a mean of 56 inches with a standard deviation of 4 inches. What statistic would you use to determine what percentage of junior high school boys are taller than 64 inches?

A. *z* for an individual score

B. *z* for a sample mean

C. single sample *t*

D. related samples *t*

E. independent samples *t*

F. one-way ANOVA

G. two-way ANOVA

H. correlation

Ans: A

Learning Objective: Choosing correct statistic

32. A sample of 30 students took a special math curriculum. After taking the class, their mean score on a standardized math test was 110. Did the sample of students who took the special math curriculum do significantly better than the national mean of 100 with a standard deviation of 7?

A. *z* for an individual score

B. *z* for a sample mean

C. single sample *t*

D. related samples *t*

E. independent samples *t*

F. one-way ANOVA

G. two-way ANOVA

H. correlation

Ans: B

Learning Objective: Choosing correct statistic

33. A professor has a section of 90 introductory psychology students. She wants to know if there is a significant difference in exam performance across freshmen, sophomores, juniors, and seniors. What statistic would be needed to determine if the mean exam performance were different across the different class years?

A. *z* for an individual score

B. *z* for a sample mean

C. single sample *t*

D. related samples *t*

E. independent samples *t*

F. one-way ANOVA

G. two-way ANOVA

H. correlation

Ans: F

Learning Objective: Choosing correct statistic

34. A college student wants to determine if degree of introversion/extroversion is associated satisfaction with life. She has a sample of 68 people take two surveys. The first survey yields a higher score the more extroverted a person is. The second survey yields a higher score the more satisfied a person is with their life. What statistics should you use to determine if scores on these two surveys are related to each other?

A. *z* for an individual score

B. *z* for a sample mean

C. single sample *t*

D. related samples *t*

E. independent samples *t*

F. one-way ANOVA

G. two-way ANOVA

H. correlation

Ans: H

Learning Objective: Choosing correct statistic

35. A counselor wants to know if the number of “anxious” episodes a person experiences in a week is related to how many times they post things on social media. She has her clients keep track of how many anxious episodes they experience for 1 week. She then goes to her clients’ Facebook pages and records how many times each person posted something. What statistic would you use to determine if anxious episodes were associated with posting to social media?

A. *z* for an individual score

B. *z* for a sample mean

C. single sample *t*

D. related samples *t*

E. independent samples *t*

F. one-way ANOVA

G. two-way ANOVA

H. correlation

Ans: H

Learning Objective: Choosing correct statistic

36. A group of 100 Americans completed a questionnaire that measured their belief that the world is fair and just. A low score on the questionnaire indicated a belief that the world is unjust and a high score indicated a belief that the world is just. A group of 100 Europeans completed that same questionnaire. Is there a difference in the mean just world belief of Americans and Europeans?

A. *z* for an individual score

B. *z* for a sample mean

C. single sample *t*

D. related samples *t*

E. independent samples *t*

F. one-way ANOVA

G. two-way ANOVA

H. correlation

Ans: E

Learning Objective: Choosing correct statistic

37. A group of 25 8th graders from a local school took a test designed to measure their knowledge of the scientific process. Two years later, the same 25 students took the same test a second time. Did the students score better the second time they took the test?

A. *z* for an individual score

B. *z* for a sample mean

C. single sample *t*

D. related samples *t*

E. independent samples *t*

F. one-way ANOVA

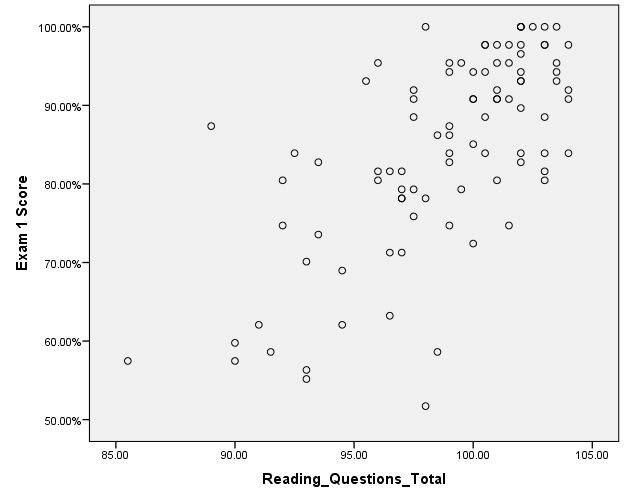
G. two-way ANOVA

H. correlation

Ans: D

Learning Objective: Choosing correct statistic

38. A statistics instructor added together the number of reading questions (RQs) students answered correctly for Chapters 1–4. He then created a scatterplot of the relationship between this “RQs Total” variable and students Exam 1 Score. Based on the scatterplot below, what statistic would you recommend?



A. run a Spearman’s correlation

B. run a Pearson’s correlation

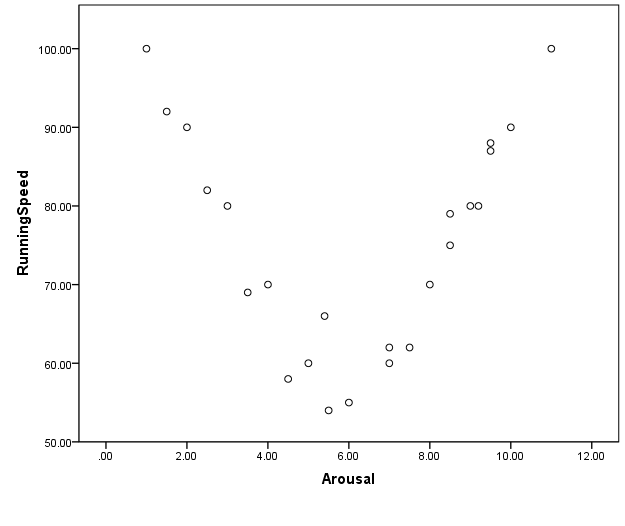
C. neither correlation will work here because the relationship to NOT monotonic

D. neither correlation will work here because there is heteroscedasticity

Ans: B

Learning Objective: Interpreting a scatterplot

39. A researcher created the following scatterplot of the relationship between arousal and running speed. Based on the scatterplot below, what statistic would you recommend?



A. run a Spearman’s correlation

B. run a Pearson’s correlation

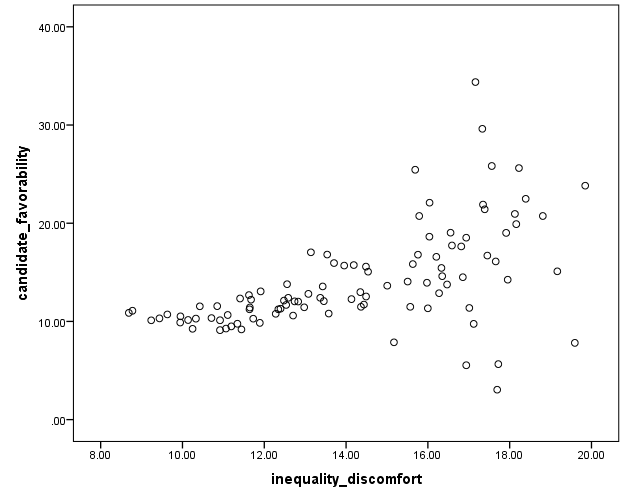
C. neither correlation will work here because the relationship to NOT monotonic

D. neither correlation will work here because there is heteroscedasticity

Ans: C

Learning Objective: Interpreting a scatterplot

40. A political scientist plotted the following relationship between political candidates’ favorability ratings and their stated discomfort with income inequality. The based on this scatterplot what statistic would you recommend?



A. run a Spearman’s correlation

B. run a Pearson’s correlation

C. neither correlation will work here because the relationship to NOT monotonic

D. neither correlation will work here because there is heteroscedasticity

Ans: D

Learning Objective: Interpreting a scatterplot

41. A student in a statistics class collects data for a class project. She asks 10 students to shoot 10 free throws on a standard basketball court and records the number of shots made by each participant. She also has these same students run an obstacle course and records there time. She wants to know if these two variables are related. *She does not have any expectations about the relationship between these variables at all*. Which of the following would be the best null hypothesis for her project?

A. There will be no correlation between these two variables.

B. There will be no positive correlation between these two variables.

C. There will be no negative correlation between these two variables.

Ans: A

Learning Objective: Two-tailed null hypothesis

42. A student in a statistics class collects data for a class project. She asks 10 students to shoot 10 free throws on a standard basketball court and records the number of shots made by each participant. She also has these same students run an obstacle course and records there time. She wants to know if these two variables are related. *She does not have any expectations about the relationship between these variables at all*. Which of the following would be the best research hypothesis for her project?

A. There will be a correlation between these two variables.

B. There will be a positive correlation between these two variables.

C. There will be a negative correlation between these two variables.

Ans: A

Learning Objective: Two-tailed research hypothesis

43. A student in a statistics class collects data for a class project. She asks 10 students to shoot 10 free throws on a standard basketball court and records the number of shots made by each participant. She also has these same students run an obstacle course and records there time. She wants to know if these two variables are related. *She does not have any expectations about the relationship between these variables at all*. What is the critical value she should use if she wants to use an alpha = .05 for this study? {Hint: should this be one tailed or two tailed]?

A. .549

B. .497

C. .632

D. .576

Ans: C

Learning Objective: Locating critical region

44. A student in a statistics class collects data for a class project. She asks 10 students to shoot 10 free throws on a standard basketball court and records the number of shots made by each participant. She also has these same students an obstacle course and records there time. She wants to know if these two variables are related. The data she collected are below. Compute the correlation between these two variables.

|  |  |
| --- | --- |
| Number of Shots Made | Obstacle Course Time |
| 5 | 10 |
| 2 | 9 |
| 6 | 4 |
| 8 | 6 |
| 5 | 5 |
| 4 | 11 |
| 3 | 12 |
| 6 | 8 |
| 5 | 6 |
| 4 | 10 |

A. −.62

B. −.51

C. .12

D. .55

E. −.75

Ans: A

Learning Objective: Computing test statistic

45. A student in a statistics class collects data for a class project. She asks 10 students to shoot 10 free throws on a standard basketball court and records the number of shots made by each participant. She also has these same students an obstacle course and records there time. She wants to know if these two variables are related. The data she collected are below. After you compute the correlation between these two variables, determine which of the following statements is accurate.

|  |  |
| --- | --- |
| Number of Shots Made | Obstacle Course Time |
| 5 | 10 |
| 2 | 9 |
| 6 | 4 |
| 8 | 6 |
| 5 | 5 |
| 4 | 11 |
| 3 | 12 |
| 6 | 8 |
| 5 | 6 |
| 4 | 10 |

A. There is enough evidence to reject the null hypothesis.

B. There is NOT enough evidence to reject the null hypothesis.

Learning Objective: Interpreting *r*

46. A student in a statistics class collects data for a class project. She asks 10 students to shoot 10 free throws on a standard basketball court and records the number of shots made by each participant. She also has these same students an obstacle course and records there time. She wants to know if these two variables are related. The data she collected are below. After you compute the correlation between these two variables, determine which of the following statements best describes the results.

|  |  |
| --- | --- |
| Number of Shots Made | Obstacle Course Time |
| 5 | 10 |
| 2 | 9 |
| 6 | 4 |
| 8 | 6 |
| 5 | 5 |
| 4 | 11 |
| 3 | 12 |
| 6 | 8 |
| 5 | 6 |
| 4 | 10 |

A. There was a significant negative relationship between shooting accuracy and obstacle course completion time.

B. There was a significant positive relationship between shooting accuracy and obstacle course completion time.

C. There wasn’t enough evidence to reject the null, but it is probably a good idea to rerun the study with a larger sample size before drawing any conclusions about the relationship between these variables.

Ans: C

Learning Objective: Summarizing results

47. Which of the following is a measure of effect size for correlations?

A. η2

B. *d*

C. *r*2

D. χ2

Learning Objective: Effect size for *r*

48. Which of the following statistical procedures provides an estimate of plausible values for a population parameter?

A. hypothesis testing

B. significance testing

C. confidence interval

D. effect size

Ans: C

Learning Objective: Purpose of CIs

49. When computing a confidence interval for a correlation coefficient (i.e., *r*), there is one an additional step that is not required when you compute a confidence interval for a mean or a mean difference. What is that additional step?

A. You must compute a margin of error.

B. You must add a margin of error to the point estimate

C. You must covert the point estimate to a *z* score before you compute the confidence interval and you must then covert it back.

D. You must compute the effect size and use that as the point estimate of the *r*.

Ans: C

Learning Objective: Computing CI for *r*

50. Which of the following is an accurate statement about the difference between a Pearson’s correlation and a Spearman’s correlation?

A. They use different formulas.

B. The Pearson’s correlation analyzes the relationship between three variables and Spearman’s correlation is limited to just two variables.

C. The Spearman’s correlation is used when at least one of the variables is measured on an interval scale.

D. The Spearman’s correlation is used when at least one of the variables is measured on an ordinal scale.

Ans: D

Learning Objective: Choosing correct correlation