

Practice Exam 1

Name: _____.

Student ID: _____.

Instruction:

- You have 75 minutes to complete the following questions.
- This exam is closed book, but you may use one-sided formula sheet with handwritten notes.
- Calculators are allowed, but no other electronic devices are allowed.
- No partial credit in any case.
- Only scantron answers will be graded.

Academic Misconduct: Any potential violation of UCLA's policy on academic integrity will be reported to the Office of the Dean of Students. All work on this exam must be your own.

Please sign, if you understand and agree with the instruction and academic misconduct.

Signature: _____.

Source: Much of this review material is adapted from review materials prepared by Vivian Lew for her Stats 10 class in Spring 2014.

(Problem 1-3) The following linear regression model can be used to predict ticket sales at a popular water park:

Predicted ticket sales per hour = $-631.25 + 11.25$ Current temperature (in °F)

Problem 1. What is the predicted number of tickets sold per hour if the temperature is 86°F? Round to the nearest whole ticket.

- (a) About 252 tickets
- (b) About 276 tickets
- (c) About 301 tickets
- (d) About 336 tickets

Problem 2. Choose the statement that best states the meaning of the slope in this context.

- (a) The slope tells us that if ticket sales are decreasing there must have been a drop in temperature.
- (b) The slope tells us that a 1°F increase in temperature is associated with an average increase in ticket sales of 11.25 tickets.
- (c) The slope tells us that high temperatures are causing more people to buy tickets to the water park.
- (d) None of the above

Problem 3. In this context, does the intercept have a reasonable interpretation?

- (a) Yes, it is reasonable for people to go to a water park when it is 0°F, so park managers might want to know how many tickets they would sell on average on a 0°F day.
- (b) No, at a temperate of 0°F, ticket sales would be -631.25 and it is not reasonable (or possible) to have negative ticket sales.
- (c) Not enough information available

Problem 4. A horticulturist conducted an experiment on 110 thirty-six inch plant boxes to see if the amount of plant food given to the plant boxes was associated with the number of tomatoes harvested from the plants. The mean amount of plant food given was 27.8 milliliters with a standard deviation of 2.1 milliliters. The mean number of tomatoes harvested was 7.5 with a standard deviation of 1.5. The correlation coefficient was 0.7691. Use the information given to calculate the slope of the linear model that predicts the number of tomatoes harvested from the amount of plant food given. Round to the nearest hundredth.

- (a) -7.50
- (b) 1.08
- (c) 0.55
- (d) The slope cannot be determined without the actual data.

Problem 5. In the NBA, the correlation between “steals per game” and “blocked shots per game” is found to be 0.8045. Choose the statement that is true about the coefficient of determination.

- (a) The coefficient of determination, R^2 , is equal to approximately 0.6472.
- (b) The coefficient of determination states that about 64.72% of the variation in the blocked shots per game is explained by steals per game.
- (c) When given as a percent, the coefficient of determination is always between 0 and 100%.
- (d) All of the above are true statements.

Problem 6. This statement: “People with diabetes are at higher risk for certain cancers than those without the blood sugar disease, suggests a new study based on a telephone survey of nearly 400,000 adults.” is referring to an:

- (a) Observational study
- (b) Experimental study

Problem 7. From the internet “One large study that included more than 2,800 people offered one of three mental training programs focused on memory, reasoning, or processing speed. The participants randomly assigned to the memory group, for instance, went through 10 hour-long training sessions that taught methods for remembering written materials, such as word lists. Two years after the training programs, people who participated in a mental exercise performed better on related tasks than others who did not participate.” This is an example of an

- (a) Observational study
- (b) Experimental study

Problem 8. The average gas mileage of the top selling minivans for each U.S. car manufacturer is an example of what type of variable?

- (a) Numerical variable
- (b) Categorical variable
- (c) Neither

Problem 9. A zip code is an example of what type of variable?

- (a) Numerical variable
- (b) Categorical variable
- (c) Neither

Problem 10. Marital status of each member of a randomly selected group of adults is an example of what type of variable?

- (a) Numerical variable
- (b) Categorical variable
- (c) Neither

Problem 11. Consider the following statement: “Researchers from a prestigious university conducted a large study and determined that children who participated in school music programs scored higher on math exams in later grades than those who did not.” Suppose that upon hearing this a politician states that all children should participate in school music programs. What is wrong with the politician’s statement?

- (a) He does not realize that difference in scores is due to the placebo effect.
- (b) He does not understand.
- (c) The controlled experiment was not double-blinded.
- (d) The politician confused correlation with causation.

Problem 12. If two numerical variables X and Y have a correlation coefficient of 0.90, what percentage of one variable can be accounted for by the other variable?

- (a) 45%
- (b) 81%
- (c) 90%
- (d) 99%
- (e) The answer will depend on which one you designate as the response variable.

(Problem 13-17) A group of elementary school students is given a reading test and the scores are reported by reading grade level. The *five-number summaries* for the boys and girls given the test are shown below:

Five number summaries for boys data : 2.0 -- 3.9 -- 4.3 -- 4.9 -- 6.0
for girls data : 2.8 -- 3.8 -- 4.5 -- 5.2 -- 5.9

Problem 13. Which group had the highest score?

- (a) Boys
- (b) Girls
- (c) They are equal

Problem 14. Which group had the greater interquartile range?

- (a) Boys
- (b) Girls
- (c) They are equal

Problem 15. Which group, if any, had an outlier?

- (a) Boys
- (b) Girls
- (c) Neither group

Problem 16. Which group generally performed better on this test?

- (a) Boys
- (b) Girls
- (c) The groups performed equally well

(Problem 17-19) Researchers waited outside of each entrance of Ackerman Union after it had been selected at random from a list of all the buildings at UCLA. They stopped every 10th person who walked into the building and did the following: (1) asked if the person was a UCLA student (2) if the person was a UCLA, then researchers asked whether the person was happy and recorded the student's answer and major (3) If the person was not a UCLA student, the researchers thanked the person for stopping and no other questions were asked. They eventually recorded the responses of 100 UCLA students and discovered that 85 said they were "happy."

Problem 17. This is called an

- (a) Observational study
- (b) Experimental study

Problem 18. The population of interest to the researchers is

- (a) All persons who go into Ackerman Union
- (b) All UCLA students
- (c) All UCLA buildings
- (d) All UCLA students who go into Ackerman Union
- (e) All persons

Problem 19. The sample is

- (a) 100 persons who went into Ackerman Union
- (b) 100 UCLA students
- (c) 100 UCLA students who went into Ackerman Union
- (d) 85 happy students
- (e) 100 responses

Problem 20. Which one of the following best describes the relationship between the correlation and the slope of the regression line modeling the relationship between X and Y ?

- (a) The correlation between X and Y equals the slope of the regression line modeling the relationship between X and Y .
- (b) When the correlation between X and Y is zero, the slope of the regression line modeling the relationship between X and Y is negative.
- (c) The sign of the correlation between X and Y is the same as the sign of the slope of the regression line modeling the relationship between X and Y .
- (d) The correlation between X and Y is not related to the slope of the regression line modeling the relationship between X and Y .
- (e) When the correlation between X and Y is zero, the slope of the regression line modeling the relationship between X and Y is positive.

Problem 21. Which of the following types of graphical tools for data allows you to see the actual data values (assuming no digits are dropped)?

- (a) Histogram
- (b) Ribbon chart
- (c) Boxplot
- (d) Dotplot
- (e) Bar chart

Problem 22. Worried that she would be late to an early morning exam, a student set TWO alarm clocks. Suppose Alarm Clock 1 is 60% reliable, meaning it will wake her up 6 times out of 10. Suppose Alarm Clock 2 is 90% reliable. What is the chance at least one of the alarms will wake her up?

- (a) .96
- (b) .90
- (c) .75
- (d) .54

Problem 23. A true/false pop quiz contains five questions. What is the probability that when guessing, a student will get at least one question correct? (Round to the nearest hundredth)

- (a) .50
- (b) .97
- (c) .76
- (d) 1.00

Problem 24. Is the following an example of theoretical probability or empirical probability? A card player declares that there is a one in thirteen chance that the next card pulled from a well-shuffled, full deck will be a Queen.

- (a) Theoretical
- (b) Empirical

Problem 25. Is the following an example of theoretical probability or empirical probability?

A homeowner notes that five out of seven days the newspaper arrives before 5pm. He concludes that the probability that the newspaper will arrive before 5pm tomorrow is about 71%.

- (a) Theoretical
- (b) Empirical

(Problem 26-29) A sample of 200 people were asked what is their most likely activity on Saturday mornings. Please assume that the 200 people were classified into only two genders, male and female.

	Homework	Housework	Outside Employment	Recreation	Other	Total
Male	29	15	20	23	9	96
Female	18	17	26	39	4	104
Total	47	32	46	62	13	200

Problem 26. If one student is randomly chosen from the group, what is the probability that the student is female?

- (a) .50
- (b) .48
- (c) .52
- (d) None of the above

Problem 27. Given that the randomly chosen student from the group is female, what is the probability that the student chose “outside employment” as their most likely activity on Saturday mornings?

- (a) .13
- (b) .25
- (c) .43
- (d) None of the above

Problem 28. What is the probability that a randomly chosen survey respondent is male or chose “recreation” as their most likely activity on Saturday mornings?

- (a) .790
- (b) .480
- (c) .675
- (d) None of the above

Problem 29. Which of the following are mutually exclusive events?

- (a) Student is male and student chose “homework” as their most likely activity on Saturday mornings.
- (b) Student is female and student chose “housework” as their most likely activity on Saturday mornings.
- (c) Student is male and student chose “outside employment” as their most likely activity on Saturday mornings.
- (d) Student chose “recreation” and student chose “other” as their most likely activity on Saturday mornings.

(Problem 30-32) You and your friend were studying and you left your cell phone either in the computer lab or in the cafe (these were the only two places you visited). You think that with probability .4 it was left in the computer lab, because you always take it out of your backpack there, otherwise, it was left in the cafe. If you left the phone in the computer lab, the probability that someone stole it is .3. In the cafe, the probability that someone stole it is twice that of the computer lab.

Problem 30. The probability of not finding your cell phone (i.e., it was stolen) is

- (a) .60
- (b) .30
- (c) .48
- (d) .18
- (e) .90

Problem 31. The probability of finding your cell phone (i.e., it was not stolen) is

- (a) .70
- (b) .40
- (c) .10
- (d) .82
- (e) .52

Problem 32. Given that your cell phone was found, what was the probability that it was found in the computer lab?

- (a) Approximately .40
- (b) Approximately .44
- (c) Approximately .54
- (d) Approximately .60
- (e) Approximately .64

THE END OF THE EXAM.