

STAT 1030 Business Statistics
Additional Final Exam Practice Questions (Part II)

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Some Practice Problems for the Final Exam¹

What a long, strange journey it has been through the world of statistics! These questions are just a sample (*wink!*) of the kinds of questions you might encounter on the Final. Hopefully, this will get you started on your Exam review.

- ⊕ A recent Gallup poll asked University of Iowa students if they liked the Herky the Hawkeye mascot. Of the 200 people surveyed, 155 liked Herky. Using $\alpha = .05$, test the claim that fewer than 80% of U of I students like Herky the Hawk.
- ⊕ What is the random variable X ?
 - (a) People in the sample that like Herky
 - (b) A person in the sample who likes Herky
 - (c) The number of people in the sample that like Herky
 - (d) The number of people in the sample
- ⊕ What is the parameter of interest?
 - (a) p : The number of people in the population that like Herky
 - (b) p : The number of people in the sample who like Herky (155)
 - (c) p : $155/200 = .775$
 - (d) p : The proportion of people in the population that like Herky
- ⊕ What is the **alternative** hypothesis?
 - (a) $p > 0.8$ (b) $p < 0.8$ (c) $p \neq 0.8$
 - (d) There is a difference between those that like Herky and those who don't.
- ⊕ What is the **null** hypothesis?
 - (a) $p \geq 0.8$ (b) $p \leq 0.8$ (c) $p = 0.8$
 - (d) There is a difference between those that like Herky and those who don't.
- ⊕ What is the **rejection region**?
 - (a) Reject H_0 if $Z < -1.645$
 - (b) Reject H_A if $Z > 1.645$
 - (c) Reject H_0 if $t > 1.645$ or $t < -1.645$
 - (d) Reject H_0 if $Z > 1.645$
- ⊕ What is the **Test Statistic**?
 - (a) $t = -.884$ (b) $t = .884$ (c) $Z = .884$ (d) $Z = -.884$
- ⊕ What is the **technical conclusion**?
 - (a) We reject H_0 ...
 - (b) We fail to reject H_0 ...
 - (c) We fail to reject H_A ...
 - (d) There is sufficient evidence to suggest the population proportion < 0.8 .
- ⊕ What is the **English interpretation**?
 - (a) We reject H_0 ...
 - (b) We fail to reject H_0 ...
 - (c) There is sufficient evidence to suggest the population proportion < 0.8 .
 - (d) There is insufficient evidence to suggest the population proportion < 0.8 .



¹ Don't look! The solutions! Page 1: C, D, B, A, A, D, B, D Page 2: B, D, B, C, D, C, B
Page 3: C, C, B, C, D, A, B, D, B, C, C, B, A.

- ✦ (Unrelated to the previous page.) Professor Whitten just performed a hypothesis test using Minitab software. He told me that he got a p -value of 0.9213. What will he probably do?
- (a) Reject the null hypothesis.
 - (b) Fail to reject the null hypothesis.
 - (c) Re-run the hypothesis test; he got an invalid p -value.
 - (d) Panic.



- ✦ Scooter goes to the Hawkeye Dance². One at a time, he asks a random lady to dance. It turns out that Scooter has a 20% chance of each chosen lady to accept his offer to dance; an 80% chance of getting rejected. Dance requests are independent. Scooter asks 40 ladies to dance. What is the expected number of accepted dance offers?
- (a) 0
 - (b) 1
 - (c) 6
 - (d) 8
- ✦ Continuing the previous question, let's say Scooter asks 20 ladies to dance. What is the probability that 5 ladies accept his dance offer?
- (a) .087
 - (b) .174
 - (c) .349
 - (d) .000
- ✦ Continuing the previous question, let's say Scooter asks 20 ladies to dance. What is the probability that 5 **or more** ladies accept his dance offer?
- (a) .093
 - (b) .185
 - (c) .370
 - (d) .000
- ✦ Here's an interesting question! At the Hawkeye Dance, Scooter keeps track of all the ladies that he's asked to dance and has recorded his results in the table below³.

	Blondes	Brunettes	Total
Accepted	13	12	25
Rejected	27	48	75
Total	40	60	100

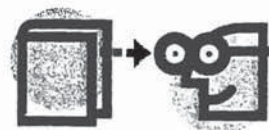
- ✦ If a randomly chosen lady is picked from this table, what is the probability that Scooter is rejected?
- (a) .25
 - (b) .40
 - (c) .60
 - (d) .75
- ✦ If a randomly chosen lady is picked from this table, what is the probability that Scooter is rejected given that a Brunette is picked?
- (a) .48
 - (b) .64
 - (c) .80
 - (d) 1
- ✦ Does Scooter getting rejected depend upon Brunette hair color?
- (a) Yes, because the probability goes from .75 to .48.
 - (b) Yes, because the probability goes from .75 to .80.
 - (c) No, because the probability remains at .75.
 - (d) What a stupid question! Who writes this stuff!?



² Based on a problem from Stat 008 – Summer
³ That is so-o-o sad!

In reality, the probability of an accepted offer is *much* lower!

- ⌘ Let X be a random variable from a Uniform distribution ranging from 5 to 12. Which of the following mathematical statements is **false**?
- (a) $P(X = 7) = 0$ (b) $P(X = 14) = 0$
 (c) $P(X > 7) = 0$ (d) $P(X > 12) = 0$
- ⌘ The probability that Scooter gets a paper cut today is 0.6. The probability that Scooter stubs his toe today is 0.4. Assuming that these injuries are independent events, what is the probability that Scooter gets a paper cut or stubs his toe today?
- (a) .20 (b) .24 (c) .76 (d) 1
- ⌘ What's a Venn diagram?
- (a) The diagram showing the Six Steps of Inference
 (b) A diagram used for determining probabilities
 (c) The name of the graphs found in Topic 10 (Regression)
 (d) About \$1.89 at the Hy-Vee
- ⌘ Professor Whitten and I have a little wager at Finkbine Golf Course's putting green. If I sink this 20-foot putt, I win \$5. If I miss this putt, I lose \$1. It is known that I have a 25% chance of making this putt. What are my expected winnings?
- (a) 0 (b) A Quarter (c) 50 Cent (d) Eminem
- ⌘ I punched a bunch of numbers into my calculator and got a sample mean of 16 and a sample standard deviation of 9. What is the variance of my numbers?
- (a) 3 (b) 4 (c) 18 (d) 81
- ⌘ Quick! Which of the following is NOT one of the Six Steps of Inference?
- (a) Conclusion (b) Inference (c) Population (d) Summary
- ⌘ Scooter performs a hypothesis test. I failed to reject the null hypothesis. However, the alternative hypothesis is actually true! What did I do?
- (a) I committed a Type I error. (b) I committed a Type II error.
 (c) I committed a Type α error. (d) I f***ed up.
- ⌘ In the board game *Life*, players advance on the board by spinning a colorful spinner that has the numbers one through ten on it. Let X represent the value from a random spin of the spinner. List the sample space for X .
- (a) $S = \{1, 10\}$ (b) $S = \{10\}$ (c) $S = 1/10$
 (d) $S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
- ⌘ If $P(A) = 0.74$ and $P(A|B) = 0.24$ and $P(B|A) = 0.35$, what is $P(A \text{ and } B)$?
- (a) .1776 (b) .259 (c) .324 (d) .473
- ⌘ Below is a stem plot of my golf scores from this past summer. :- (
- | | | | | |
|----|--|---|---|-----|
| 8 | | 9 | | |
| 9 | | 4 | 7 | 9 9 |
| 10 | | 0 | 5 | 8 |
| 11 | | 2 | | |
| 12 | | 3 | 4 | |
- What is my median golf score?
- (a) 10 (b) 99 (c) 100 (d) 99.5
- ⌘ What was my maximum golf score?
- (a) 12 (b) 123 (c) 124 (d) 1234
- ⌘ IQ scores are distributed "like a bell curve". They have a mean of 100 and a standard deviation of 20. Quick! If I randomly pick an IQ score, what is the probability that it is between 80 and 120?
- (a) 50% (b) 68% (c) 95% (d) 99%
- ⌘ What is the complement of the probability event "The Packers will win Super Bowl XL"?
- (a) The Packers will not win Super Bowl XL.
 (b) The Packers will win every Super Bowl except Super Bowl XL.
 (c) The Packers will win every game this season except Super Bowl XL.
 (d) Hey, at least the Packers will beat the Bears, right?





Some More Practice Problems for the Final Exam¹

- ⌘ Recently, a website called *The Facebook* has become popular amongst students on the University of Iowa campus. The University's Student Government would like to financially support this website. However, funds can only be allocated if 60% or more of the U of IA's undergraduate students are currently members of *The Facebook*. To assess this claim, the Student Government asked several Statistics students to conduct a random sample of students and ask "Are you currently a member of the website *The Facebook*?" The results are below:

	Are you a member of <i>The Facebook</i> ?	
	Yes	No
Undergraduate Students	104	85
Graduate Students	42	58

- ⌘ Which choice is the best choice for **Step 1** in the **Six Steps of Inference**?
- What percentage of University of Iowa students are members of *The Facebook*?
 - Do more graduates or undergraduates register for *The Facebook*?
 - What percentage of University of Iowa undergraduates are members of *Facebook*?
 - What percentage of college students are members of *The Facebook*?
- ⌘ Which choice is the best choice for **Step 2** in the **Six Steps of Inference**?
- All University of Iowa students
 - All University of Iowa Undergraduates & All University of Iowa Graduates
 - All University of Iowa students that are members of *The Facebook*
 - All University of Iowa Undergraduates
- ⌘ Which choice is the best choice for **Step 3** in the **Six Steps of Inference**?
- The 189 Undergraduates students surveyed
 - The 189 Undergraduates & 100 Graduates surveyed
 - The 104 Undergraduates surveyed that replied "Yes"
 - The 146 U of Iowa students surveyed that replied "Yes"
- ⌘ Which choice is the best choice for **Step 4** in the **Six Steps of Inference**?
- Yes/No answer to if a student is an undergraduate
 - Yes/No answer to if a student is a member of *The Facebook*
 - The total number of students that answered "Yes" to the survey
 - The percentage of students that answered "Yes" to the survey
- ⌘ Which choice is the best choice for **Step 5** in the **Six Steps of Inference**?
- 55% of the undergraduates in the survey are members of *The Facebook*.
 - Approximately 36% of the students in the survey are undergrads in *The Facebook*.
 - 104 University of Iowa undergraduates sampled are members of *The Facebook*.
 - 50.5% of sampled U. of Iowa students are members of *The Facebook*.
- ⌘ Which choice is the best choice for **Step 1** in the **Six Steps of Inference**?
- 55% of the undergraduates in the survey are members of *The Facebook*.
 - Approximately 36% of the students in the survey are undergrads in *The Facebook*.
 - Approximately 55% of all U. of IA undergraduates are members of *Facebook*.
 - Approximately 50.5% of all U. of IA students are members of *The Facebook*.

¹ Don't look! The solutions! Page 4: C, D, A, B, A, C Page 5: A, B, C, C, D, A, C,
Page 6: σ , Σ , β_1 , μ , α , β_0 , D, C, D

- ✦ When I'm not playing Pinball in my office, I'm playing *Wheel of Fortune* online. The following is a list of my last ten final scores (in thousands of dollars):
10.5 6.9 27.7 10.3 8.4 37.1 9.0 2.0 31.9 12.4
- ✦ What is the best estimate of my typical final score for all games that I play (in \$1000)?
(a) 10.40 (b) 15.62 (c) 12 (d) 12.4
- ✦ What is the best estimate for the minimum score obtained in the highest 20% of all final scores (in \$1000)?
(a) 6.9 (b) 31.9 (c) 34 (d) 37.1
- ✦ Calculate the standard deviation of my last ten final scores (in \$1000).
(a) 3.46 (b) 15.62 (c) 12 (d) 143
- ✦ Every so often, players on *The Price is Right* have the chance to spin the big wheel for big money. A player only gets one spin. If the wheel lands on the one red space, she wins \$10,000. If the wheel lands on one of the two green spaces, she wins \$5,000. If she lands on the any of the remaining 17 spaces, she wins no money (but has a chance to win in the *fabulous* Showcase Showdown!) What is this player's expected winnings on the big wheel?
(a) \$0 (b) \$500 (c) \$1,000 (d) \$2,000
- ✦ In the previous question, what is the player's standard deviation?
(a) \$6,500,000 (b) \$50.5 (c) \$250 (d) \$2549.51
- ✦ In the Fall 2004 semester of *Statistics for Business*, 60% of the students were male and 40% of the students were female. It turns out that 75% of the female students went on to take the second course in the sequence, *Statistics and Strategies*. Only 45% of the male students went on to take *Statistics and Strategies*. What percentage of Fall 2004 *Statistics for Business* students went on to take *Statistics and Strategies*?
(a) 57% (b) 30% (c) 70% (d) 120%
- ✦ In the previous question, what is the probability of randomly selecting a female student, given that you selected a student who went on to take *Statistics and Strategies*?
(a) 25.6% (b) 30% (c) 52.6% (d) 75%

It's Greek To Me! In this course, we have seen quite a few Greek letters used in formulas, notations, etc. In this activity, you need to match the Greek letter with the correct definition.

Σ α β_0 β_1 μ σ

- _____ The population standard deviation
- _____ This symbol means to "add up all of the values"
- _____ The slope of the true regression line
- _____ The population average/mean
- _____ The probability of making a Type I error
- _____ The y -intercept of the true regression line



- ✦ Last year, I gave a particular quiz to my Statistics section. There were 10 questions on this quiz and no partial credit was given. After grading the papers, I wrote down for each student the number of questions the student got right and the number wrong. The average number of right answers is 6.4 with a S.D. of 2; the average number of wrong answers is 3.6 with a S.D. of 2. What is the approximate correlation r ? (Hint: Draw a picture.)
 - (a) 0 (b) 0.5 (c) 1 (d) -1
- ✦ Which of the following symbols is typically **not** used in linear regression?
 - (a) β_0 -hat (b) β_1 -hat (c) p -hat (d) y -hat
- ✦ Fill in the blank. The prediction interval is _____ than the confidence interval.
 - (a) more plausible (b) more precise (c) less variable (d) wider