Review Test Submission: MBC638 Quiz #10 - C.L.T., C.I. for mu (due Sunday, Nov. 11, 10:00pm)

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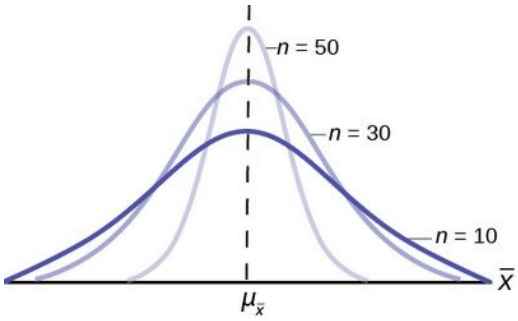
Course	MBC.638.M001.FALL18.Data Anls & Decisn Making
Test	MBC638 Quiz #10 - C.L.T., C.I. for mu (due Sunday, Nov. 11, 10:00pm)
Started	11/11/18 3:46 PM
Submitted	11/11/18 4:22 PM
Status	Completed
Attempt Score	110 out of 100 points
Time Elapsed	35 minutes out of 1 hour
Results Displayed	All Answers, Submitted Answers, Correct Answers, Feedback, Incorrectly Answered Questions

Question 1

15 out of 15 points



We have a population with mean 180 and standard deviation 22.

For any random sample with 300 observations from this population, what is the probability that this sample's average will be **more than 2 points away** from the population mean?

Your answer should be in decimal form, rounded to 4 decimal places.

(Recall that you don't even need to know the value of the population mean to solve this problem! Try solving this problem with and without the population mean value.)

Selected Answer: 0.1154
Correct Answer: 0.1154
Answer range +/- 0.0002 (0.11520 - 0.11560)
Response Feedback:

Question 2

15 out of 15 points

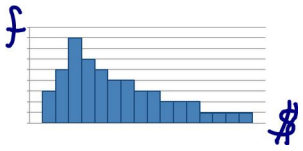
You want to estimate population mean μ using sample mean $\bar{x}$. For a population with $\sigma = 5$, to ensure that there is a 90% or higher chance that your sample mean is within ±1 point away from the true population mean, you need to collect data from a random sample with **at least how many data points**?

Selected Answer: 68 or more
Answers: 32 or more
51 or more
60 or more
68 or more
Response Feedback:

Question 3

15 out of 15 points

Home Depot's receipts show that customer purchase amounts follow a **right-skewed** distribution with μ=152 and σ=87 :

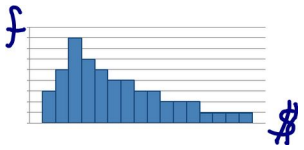


Perform all calculations in Excel and answer the following questions.

a. The day before Halloween, Home Depot had 500 customers. What is the probability that Home Depot's total revenue would exceed $77,000 on this day? Round to 5 decimal places. **0 . [a][b][c][d][e]**
b. On a typical day, Home Depot has 300 customers. How much revenue does Home Depot take in on the best 5% of such days? Round to the closest digit. **$ [f][g],[h][i][j] or more**

Selected Answer:

Home Depot's receipts show that customer purchase amounts follow a **right-skewed** distribution with μ=152 and σ=87 :

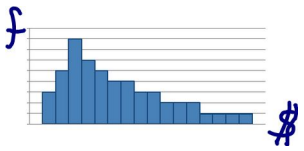


Perform all calculations in Excel and answer the following questions.

a. The day before Halloween, Home Depot had 500 customers. What is the probability that Home Depot's total revenue would exceed $77,000 on this day? Round to 5 decimal places. **0 . 3 0 3 6 1**
b. On a typical day, Home Depot has 300 customers. How much revenue does Home Depot take in on the best 5% of such days? Round to the closest digit. **$ 4 8, 0 7 9 or more**

Answers:

Home Depot's receipts show that customer purchase amounts follow a **right-skewed** distribution with μ=152 and σ=87 :



Perform all calculations in Excel and answer the following questions.

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b. On a typical day, Home Depot has 300 customers. How much revenue does Home Depot take in on the best 5% of such days? Round to the closest digit. **$ 4 8, 0 7 9 or more**

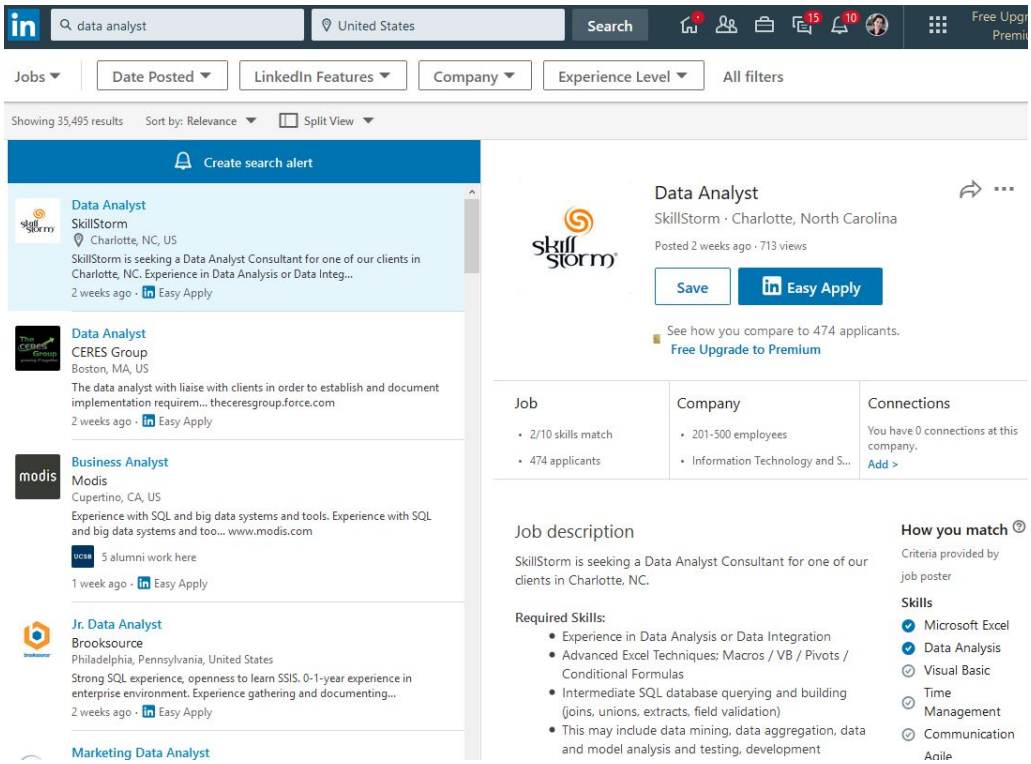
All Answer Choices

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Response Feedback:

Question 4

20 out of 20 points



If you like working with data and Excel, then a career at Google might be the one for you! Check out their internships and job listings at **https://careers.google.com/students/** and don't forget to apply.

According to this website (**https://www.northeastern.edu/graduate/blog/how-to-increase-data-analyst-salary/**), data scientists are in high demand and earn between $77,500 and $118,750 depending on their experience, education, and skill set.

Suppose that the average starting salary of data scientists with a graduate degree in business is $110,000 a year with the standard deviation of $45,000, while the average starting salary of data scientists with a graduate degree in non-business areas, such as information studies, is $105,000 a year with the standard deviation of $60,000.

35 of 2nd year Whitman graduate students recently accepted jobs as data scientists, and 50 of 2nd year iSchool graduate students have accepted jobs of data scientists.

a) What is the probability that the average salary for these Whitman students would exceed the average salary for these iSchool students? **[a]**

Your answer should be in decimal form, rounded to 4 decimal places.

b) After these two groups of graduates started working as data scientists, we discovered that the average starting salary of these Whitman students is $97,000 while for these iSchool students it's $110,000. The difference is -$13,000. Is this difference unusual? Write YES or NO. **[b]**

c) Your answer in part b) should be based on an appropriate Z-score. Recall that an observation is considered an (possible) outlier if |z|>2. What is the value of this Z-score that your YES/NO answer was based upon? **[c]**

Your answer should be rounded to 4 decimal places.

Specified Answer for: a 0.6696

Specified Answer for: b NO

Specified Answer for: c -1.5796

Correct Answers for: a		
Evaluation Method	**Correct Answer**	**Case Sensitivity**
Contains	.6696	
Contains	66.96	
Contains	.66	
Contains	66.9	
Exact Match	0.6696	

Correct Answers for: b		
Evaluation Method	**Correct Answer**	**Case Sensitivity**
Contains	NO	
Correct Answers for: c		
Evaluation Method	**Correct Answer**	**Case Sensitivity**
Exact Match	-1.5796	
Contains	1.5796	
Contains	1.5	

Response Feedback:

Question 5 10 out of 10 points

Confidence interval for μ is [$3,000 to $5,000]. Confidence level is **95%**. Which of the following should be true?

Selected Answer: Confidence level is **99%**. Confidence interval for μ is [$2,000 to $6,000].

Answers:
Confidence level is **99%**. Confidence interval for μ is [$2,000 to $5,500].
Confidence level is **99%**. Confidence interval for μ is [$2,000 to $6,000].
Confidence level is **99%**. Confidence interval for μ is [$3,500 to $4,500].
Confidence level is **99%**. Confidence interval for μ is [$2,500 to $6,000].

Response Feedback:

Question 6 10 out of 10 points

A marketing analyst, David, wants to estimate the average spending (per person) nationally during Black Friday the day after Thanksgiving. As a result of his estimation, David finds the confidence interval to be [$3,000 to $5,000]. It is based on 100 shoppers that David has surveyed. David is unhappy. The confidence interval is too wide... How many shoppers does David need to survey in order to get the confidence interval to be [$3,500 to $4,500]?

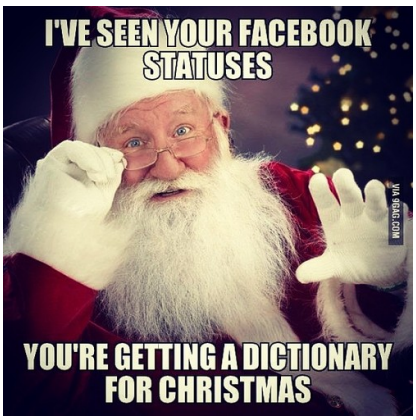
Selected Answer: 400

Answers:
50
150
200
250
300
350
400
450
500
550
600

Response Feedback:

Question 7

15 out of 15 points



As businesses are preparing for the upcoming holiday season, we are beginning to plan our holiday shopping too!

The National Retail Foundation has reported that in 2017, U.S. households spent an average of **$637** during the December holiday season. You would like to know if holiday spending would be similar this year (2018). You carry out a survey of **15** households and record their average as **$648**. In the past, the standard deviation of spending amounts has been **$172** and a histogram of spending amounts has shown that they are approximately Normally distributed.*

a) You want to estimate this year's average holiday spending in the country. With **95% confidence**, what is the **margin of error**? (Perform your calculations in Excel; round your answer to 5 decimal places.)

b) Although this problem doesn't ask you to do so, think about how you would answer the following question: Can you conclude that the average holiday spending in the U.S. has changed since a year ago, and if so then how?

* Note that we would not need the Normality assumption if n was 30 or more.

Selected Answer: 87.04241

Correct Answer: 87.04241 ± 0.001

Response Feedback:

Question 8

10 out of 10 points (Extra Credit)

BONUS! This problem is optional. You can receive 100 points on this quiz even without solving this problem. Your grade for the quiz will be capped at 100.

Banks play a crucial role in market economies. They decide who can get finance and on what terms and can make or break investment decisions. For markets and society to function, individuals and companies need access to credit.

Credit scoring algorithms, which make a guess at the probability of default, are the method banks use to determine whether or not a loan should be granted.

The file **Give me some credit.xlsx** contains historical data for 150,000 borrowers in a bank.

Today, a financial advisor at this bank was dealing with three different customers each of whom was trying to get a loan.

- **Customer 1**: Mr. Hofmann, a 30 year old lawyer, has a history of being once 30-59 days past due, has debt ratio of 0.53, and has 2 dependents.
- **Customer 2**: Ms. Silolahti, a 24 year old business school student, has a history of being 4 times 30-59 days past due, has debt ratio of 0.79, and has no dependents.
- **Customer 3**: Mrs. Wu, a 78 year old retired real estate broker, has a history of being twice 30-59 days past due, has debt ratio of 0.44, and has 5 dependents.

What is the **probability that all 3 of these customers would experience a serious delinquency** (variable *SeriousDlqin2yrs*)**?**

Your answer must be in decimal form, rounded to 8 decimal places.

Selected Answer: 0.00082606
Correct Answer: 0.000826065
Answer range +/- 1.00E-07 (0.000825965 - 0.000826165)
Response Feedback:

Wednesday, November 21, 2018 1:17:02 PM EST

← OK