2510-001: QUIZ WEEK 11

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2019-11-08

Your name (print clearly in capital letters): _____

Read Me Carefully

- This quiz is out of 10 points.
- Please **answer each graded question**, return this quiz to me by **Friday, November 8th at 8:20am**.
- You may complete any of the *additional questions* to earn back points on either this quiz or the Week 10 quiz.
- You should use your notes, a calculator, and a piece of scratch paper. You do not need to show work.
- You may not collaborate.

Graded Questions

(1) (2 points) It is estimated that 2% of the world's population has green eyes. How many CU students would be needed to estimate the percentage of CU students with green eyes within 0.1% at 95% confidence?

> Your answer:

(2) (1 point) Is it feasible to obtain a sample of this size from CU students?

> Your answer:

(3) Suppose you are going to be testing a hypothesis percentage of people with green eyes and the null hypothesis is that $p = 0.02$. If your random sample of size $n = 200$ found 6 people with green eyes, is this an appropriate sample to use for a hypothesis test?

  (a) (1 point) Yes or no?

  > Your answer:

  (b) (1 point) Explain.

  > Your answer:

(4) If your random sample of size $n = 300$ found 6 people with green eyes, is this an appropriate sample to use for a hypothesis test?

  (a) (0 points) Yes or no?

  > Your answer: Yes.

  (b) (1 point) Explain.

  > Your answer:

(5) (2 points) If the alternate hypothesis is that more than 2% of the population has green eyes, what conclusion would you make at the 5% significance level based on the second sample (from question 4)?

> Your answer:

(6) (2 points) If you perform 20 independent hypotheses tests, each at the 5% level of significance,[1] what is the probability at least one of them rejects the null hypothesis?

> Your answer:

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[1]Hint: What does the level of significance α mean in hypothesis testing? What is "Type I error"?

Additional Questions

(6 points possible) What are the mathematical expression for the respective margin of errors

$$E = z^\star \times SE$$

or

$$E = t^\star \times SE$$

in the third column of the following table?

With a c-level of confidence, I want to estimate...	calculator function...	In this case, the margin of error E is...
A population mean μ with known population standard deviation σ	ZInterval	
A population mean μ with unknown population standard deviation	TInterval	
A population proportion p	1-PropZInt	
A difference of population means $\mu_1 - \mu_2$ with unknown population standard deviation σ	2-SampZInt	
A difference of population means $\mu_1 - \mu_2$ with known population standard deviation σ	2-SampTInt	
A difference of population proportions $p_1 - p_2$	2-PropZInt	