

MITx: 14.310x Data Analysis for Social Scientists

Helj



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# The Central Limit Theorem - Quiz

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## Question 1

1/1 point (graded)

True or False: The Central Limit Theorem (CLT) implies that for a reasonably large random sample, the distribution of your population will be approximately normal.

a.	True



#### **Explanation**

The CLT implies that the distribution of the sample mean for an i.i.d. random sample will be approximately normal if the sample size is large enough. The distribution of the population will be determined by the specific characteristics of that population and generally, will not be affected by changes in the sample size.

Submit

You have used 1 of 1 attempts

- Module 5: Moments of a Random Variable,
   Applications to Auctions,
   Intro to Regression
- Module 6: Special
   <u>Distributions, the</u>

   <u>Sample Mean, the</u>
   <u>Central Limit Theorem,</u>
   and Estimation

#### <u>Human Subjects and Special</u> Distributions

Finger Exercises due Nov 07, 2016 at 05:00 IST

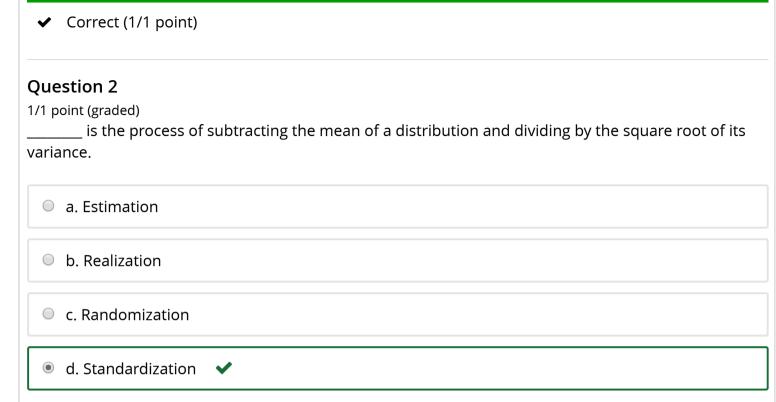
# The Sample Mean, Central Limit Theorem, and Estimation

Finger Exercises due Nov 07, 2016 at 05:00 IST

#### Module 6: Homework

<u>Homework due Oct 31, 2016 at</u> 05:00 IST

Exit Survey



# **Explanation**

D. As mentioned by Professor Ellison, standardization is the process of subtracting the mean of a distribution and dividing by the square root of its variance, which creates a random variable with 0 mean and variance 1. The other options are unrelated statistical concepts.

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You have used 1 of 2 attempts

✓ Correct (1/1 point)

# **Question 3**

1/1 point (graded)

The central limit theorem says that:

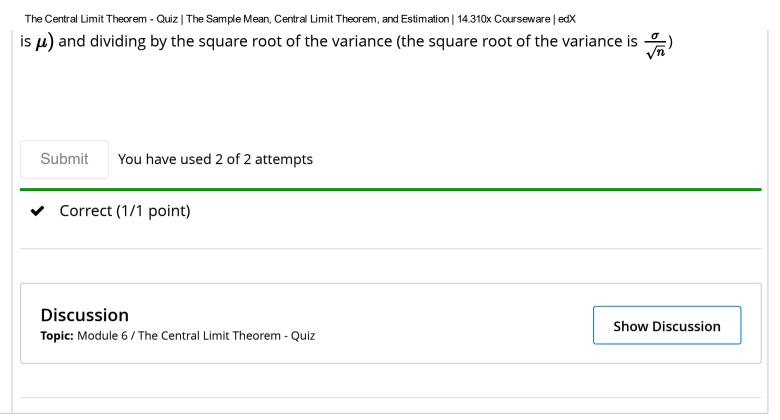
$$\lim_{n o\infty} Pigl[rac{\sqrt{n}(ar{x}-\mu)}{\sigma} \leq xigr] = \Phi(x)$$

 $Pigl[rac{\sqrt{n}(ar{x}-\mu)}{\sigma} \leq xigr]$  represents:

- a. The probability distribution function (PDF) of the standardized sample mean
- b. The cumulative distribution function (CDF) of the standardized sample mean
- c. The probability distribution function (PDF) of the population
- d. The cumulative distribution function (CDF) of the population

#### **Explanation**

We know that it is a CDF because the definition of a CDF is the probability that a random variable is less than or equal to some value of x. We know that it is the CDF of the standardized sample mean because  $\frac{\sqrt{n}(\bar{x}-\mu)}{\sigma}$  is the sample mean  $\bar{x}$  after the process of subtracting the mean of the distribution of  $\bar{x}$  (which



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