

Math 153 - Quiz 14

December 6, 2018

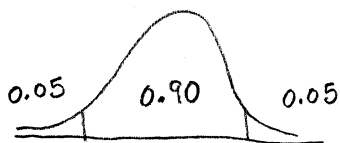
Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) As manager for an advertising company, you must plan a campaign designed to increase Twitter usage. Assume you know nothing about the proportion of adults who are familiar with Twitter. You would like to compute a 90% confidence interval estimate for the true population proportion of adults who are familiar with Twitter.

- (a) What sample size is required so that your estimate is within 4 percentage points of the true population proportion?



$$z_{\alpha/2} = \text{invNorm}(0.95) \\ = 1.645$$

$$n = \frac{(1.645)^2 (0.25)}{(0.04)^2} \approx 422.8$$

Use $n = 423$

- (b) Suppose you obtained a simple random sample of 300 adults, and you found that 82% were familiar with Twitter. Determine the corresponding 90% confidence interval estimate for the population proportion.

1-Prop ZInt

$$X = (0.82)(300) = 246$$

$$n = 300$$

$$C\text{-Level} = 0.90$$

90% C.I. ESTIMATE IS

$$(0.78352, 0.85648)$$

- (c) Write a complete sentence that gives a valid interpretation of your interval.

WE ARE 90% CONFIDENT THAT THE TRUE PROPORTION OF ADULTS WHO ARE FAMILIAR WITH TWITTER IS BETWEEN 78% AND 86%.

2. (2 points) Listed below are the amounts of mercury, in parts per million (ppm), found in tuna sushi sampled at different stores in New York City.

0.56, 0.75, 0.10, 0.95, 1.25, 0.54, 0.88

Find a 95% confidence interval estimate for the population mean. Write a complete sentence that gives a valid interpretation of your interval.

T Interval w/ Data

C-Level = 0.95

95% C.I. ESTIMATE IS (0.3803, 1.0568)

WE ARE 95% CONFIDENT THAT THE MEAN AMOUNT OF MERCURY IN TUNA SUSHI IN NEW YORK CITY IS BETWEEN 0.38 ppm & 1.06 ppm.

Follow-up: What assumptions must you make if you are to believe that your interval estimate is accurate?

BECAUSE $n = 7 < 30$, WE MUST ASSUME THE MERCURY AMOUNTS ARE NORMALLY DISTRIBUTED.