# Practice Quiz 7

Statistics 200
Dr. Nancy Pfenning
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1. (5 pts.) A survey asked 1000 adult Americans in the year 2004, "Should elected officials set their convictions aside to get results in government?"; the proportion who answered yes was 0.74. Suppose we want to determine if the proportion is significantly less than 0.84, which is how many answered yes to the question in the year 2000.

    (a) Which one of these is the correct formulation of the alternative hypothesis in this case? (i) $H_a : p = 0.74$ (ii) $H_a : p < 0.74$ (iii) $H_a : \hat{p} = 0.74$ (iv) $H_a : \hat{p} < 0.74$ (v) $H_a : p = 0.84$ (vi) $H_a : p < 0.84$ (vii) $H_a : \hat{p} = 0.84$ (viii) $H_a : \hat{p} < 0.84$

    (b) For $n = 1,000$ and $p_0 = 0.84$, the standard deviation of sample proportion is 0.012. Find the $z$-statistic. _____

    (c) The $z$-statistic is (i) not large (ii) large (iii) borderline.

    (d) The $P$-value is (i) not small (ii) small (iii) borderline.

    (e) Based on the data provided, can we conclude that less than .84 of all Americans believed in 2004 that elected officials should set their convictions aside to get results in government?

    (f) Which of these is a potential source of bias?
        i. The proportion of Republicans in the sample was much more than the proportion in the population.
        ii. The survey was anonymous.
        iii. Both (i) and (ii).
        iv. Neither (i) nor (ii).

    (g) Suppose the sample proportion had been found to be 0.90. Explain why a formal test would not be necessary in order to conclude that there isn't enough evidence to convince someone that less than 0.84 of all Americans agreed with the statement in 2004.

2. (5 pts.) Amount spent in 2010 by a sample of 400 "Black Friday" weekend shoppers had a mean of 365 dollars. Assume a population standard deviation of 240 dollars.

(a) Set up a 95% confidence interval for population mean amount spent.

(b) Based on your confidence interval, is 343 dollars a plausible value for population mean amount spent? (i) yes (ii) no (iii) borderline

(c) Suppose someone wants to test a claim that the overall mean amount spent in 2010 differs from the mean for 2009, 343 dollars. What is the correct formulation of the alternative hypothesis in this case?
(i) $H_a : \mu > 365$ (ii) $H_a : \mu \neq 365$ (iii) $H_a : \bar{x} > 365$ (iv) $H_a : \bar{x} \neq 365$
(v) $H_a : \mu > 343$ (vi) $H_a : \mu \neq 343$ (vii) $H_a : \bar{x} > 343$ (viii) $H_a : \bar{x} \neq 343$

(d) Calculate the standardized test statistic for the test in (c). _____

(e) The absolute value of our test statistic is (i) not large (ii) large (iii) borderline.

(f) The $P$-value is (i) not small (ii) small (iii) borderline.

(g) Which of these should we believe? (i) $H_0$ (ii) $H_a$ (iii) inconclusive

(h) If a researcher wants to claim that the population mean amount spent in 2010 is *greater than* 343 dollars, the $P$-value would be
(i) half (ii) twice (iii) the same as the one for the test described above.