

Quiz

1. Please provide brief answers to the following questions:

- a) Say you are conducting a statistical test for the population mean at the usual $\alpha = 0.05$ level. The null hypothesis is $H_0 = 17.1$, while the alternative hypothesis is $H_a \neq 17.1$. The sample size is large enough to use a normal distribution, and the statistics for the sample turns out to be $z_0 = 2.045$. You therefore compute the p-value to be 0.0404 . What is your conclusion?
- b) Say you are using a t-distribution with $df = 10$ for a statistical test, the computed t -value is $t_0 = 2.75$, and the $t_{.025}$ value from the t -table is $t_{.025} = 2.228$. What is your conclusion?
- c) A statistical test for the population mean at the $\alpha = 0.05$ level results in your rejection of the null hypothesis with $p = 0.02$. Can the null hypothesis still be true? If so, what is the probability that the null hypothesis is true, even though you rejected it?

2. A group of 4 secondary education student teachers were given 2 1/2 days of training in interpersonal communication group work. The effect of such a training session on the dogmatic nature of the student teachers was measured using the scores on the "Rokeach Dogmatism test". The resulting scores were 10, 8, 12, 10. Test the hypothesis that average dogmatism test score for all secondary education student teachers is 12. Use alpha = 0.05 as usual.

3. Using the General Social Sciences 1996 survey data to find the average number of hours that people watched TV in the US in 1996, you find that the descriptive statistics for the variable 'tvhours' are:

$$N = 1000, \text{ Mean} = 2.96, \text{ Standard Deviation} = 2.38$$

At a conference you hear someone referring to the (supposed) fact that "the average American watches 3.5 hours of TV a day". Would you challenge the speaker, based on the above data (at the 0.05 level)?

4. We are investigating whether the average life expectancy of adults is different between Blacks and Whites in the US in 1996. We use the GSS 1996 survey data to compute the following values:

Blacks: sample mean 46.1, standard deviation 16.2, sample size 402

Whites: sample mean 48.8, standard deviation 17.3, sample size 2349

Based on the outcome of this test, is there a significant difference in average age between the two groups? Use $\alpha = 0.05$, as usual. Make sure to state the null and alternative hypothesis that you are making when conducting the test.