Statistics (I) Date: January-8, 2018

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1. For each conjecture, state the null and alternative hypotheses:
2. The average cost of a smartphone is more than $17,500.
3. The average income of accountants is $51,000.
4. The average score of basketball games is less than 98.
5. The average age of community college students is greater than 24.6 years.
6. The average pulse rate of male marathon runners is less than 70 beats per minute.

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1. Using the ***z* table**, determine the critical values for a two-tailed test when *α* = 0.05.
2. Using the ***z* table**, determine the critical value for the right-tailed test with *α* = 0.01.
3. What is the **critical value** for a **two-tailed *t* test** when *α* = 0.02 and d.f. = 18?
4. What is the **critical value** for a **right-tailed *t* test** when *a =* 0.025 and d.f. = 12?
5. If the sample mean is 9, the hypothesized population mean is 7, and the population standard deviation is 4, (a) compute the test value needed for the *z* test, (b) find the **critical value** for a **right-tailed test** when *a =* 0.05.
6. A recent study of business travelers claims they spend an average of $41.00 per day on meals. As a test of this claim, a random sampling of 16 business travelers found they had spent an average of $45.00 per day with a standard deviation of $3.65. (a) What are the **critical values** for a **two-tailed *t* test** of this claim with *a =* 0.05?

(b) What is the test value.

Hypothesis Testing Procedure:

*a.* State the hypotheses and identify the claim.

*b.* Find the critical value(s) and critical region.

*c.* Compute the test value.

*d.* Make the decision.

*e.* Summarize the results.

1. A researcher knew that before cell phones, a person made on average 2.8 calls per day. He believes that the number of calls made per day today is ***higher***. He selects a random sample of 25 individuals who use a cell phone and asks them to keep track of the number of calls that they made on a certain day. The sample mean was 3.2. At = 0.01 is there enough evidence to support the researcher’s claim? The standard deviation for the population found by a pervious study is 0.8. Would the null hypothesis be rejected at= 0.05? (8-2 #9)
2. An obstetrician read that a newborn baby loses on average 210 grams in the first two days of his or her life. He feels that in the hospital where he works, the average weight loss of a newborn baby is ***less than*** 210 grams. A random sample of 36 newborn babies has a mean weight loss of 186 grams. The population standard deviation is 20 grams. Is there enough evidence at = 0.05 to support his claim? (8-2, #11)
3. Teens are reported to watch the fewest total hours of television per week of all the demographic groups. The average television viewing for teens on Sunday from 1:00 to 7:00 P.M. is 88 minutes. A random sample of local teens disclosed the following times for Sunday afternoon television viewing. (8-3 #11)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2:30 | 2:00 | 1:45 | 3:02 | 1:00 | 1:50 | 2:08 | 1:30 | 2:15 | 🡺 mean=120, variance = 1232.25 |

1. Find 99% confidence interval for the population mean.
2. At =0.01, can it be concluded that the average is greater than the national viewing time?