Question 1

Dole Pineapple Inc. is concerned that the 16-ounce can of sliced pineapple is being overfilled. Assume the standard deviation of the process is 0.03 ounces. The quality- control department took a random sample of 50 cans and found that the arithmetic mean weight was 16.05 ounces. At the 5% level of significance, can we conclude that the mean weight is greater than 16 ounces?

|  |  |
| --- | --- |
| Null Hypothesis | Alternative |
| = | ≠ |
| ≥ | < |
| ≤ | > |

*(H0): μ* ≤16 (Mean can of sliced pineapple less than 16)

(*H1): μ* > 16 (Mean can of sliced pineapple is overfilled)

=11.79

* A one sample z-Test was conducted to determine if the cans are overfilled
* The test was conducted at α = 0.05
* The obtained zstat (11.8) falls in the rejection region therefore there is enough evidence to reject the null hypothesis
* We can conclude that the cans are overfilled.

**Question 2**

Annual per capita consumption of milk in Ireland is 21.6 gallons. Being from Cork, you believe milk consumption is higher there and wish to support your opinion. A sample of 16 individuals from Cork showed a sample mean annual consumption of 24.1 gallons with a standard deviation of s = 4.8.

Develop a hypothesis test that can be used to determine whether the mean annual consumption in Cork is higher than the national mean. At α =0.05, test for a significant difference. What is your conclusion?

*(H0): μ* ≤ 21.6 (Mean of the milk consumption is less or equal to 21.6)

(*H1): μ* > 21.6 (Mean of the milk consumption is higher than 21.6)

=2.08

df= n-1=16-1=15

* A one-sample t-test was conducted to determine if milk consumption in Cork
* The test was conducted at α = 0.05
* The obtained tstat (2.08) is higher than tcrit (1.753) so we reject the null hypothesis in favour to the alternative hypothesis
* We can conclude that the milk consumption in Cork is higher than in the rest of Ireland.

Question 3

According to a recent survey, Americans get a mean of 7 hours of sleep per night. A ran- dom sample of 50 students at West Virginia University revealed the mean number of hours slept last night was 6 hours and 48 minutes (6.8 hours). The standard deviation of the sample was 0.9 hours. Is it reasonable to conclude that students at West Virginia sleep less than the typical American?

*(H0): μ* ≥ 7

(*H1): μ* < 7

=-1.57

* A one-sample t-test was conducted to determine if the sleep hours in virginia is less than a typical american
* The test was conducted at α = 0.05
* The obtained tstat (-1.57) is higher than tcrit (-1.67) so we fail to reject the null hypothesis therefore people in Virginia do not sleep less than the rest of american

Note

Diagram, table

Description automatically generated

Question 4

As part of a study of corporate employees, the director of human resources for PNC Inc. wants to compare the distance traveled to work by employees at its office in downtown Cincinnati with the distance for those in downtown Pittsburgh. A sample of 35 Cincinnati employees showed they travel a mean of 370 miles per month. A sample of 40 Pittsburgh employees showed they travel a mean of 380 miles per month. The population standard deviation for the Cincinnati and Pittsburgh employees are 30 and 26 miles, respectively. At the .05 significance level, is there a difference in the mean number of miles traveled per month between Cincinnati and Pittsburgh employees?

H0: µGroup 1 = µGroup 2

H1: µGroup 1 ≠ µGroup 2

We know the population standard deviation, so we use z-test 😊.

* A two sample z-Test was conducted to determine if the travel time is similar between sample
* The test was conducted at α = 0.05
* The obtained zstat (1.53) is between zcrit,α/2 (-1.96) and zcrit,α/2 (1.96) therefore we fail to reject the null hypothesis.
* We can conclude that the travel time is the same in both office.