Question: 4) A researcher wishes to test whether the mean weight of th...

4) A researcher wishes to test whether the mean weight of the adult men in Bangladesh is more than 70kg . To test this 5 people are selected & their weights are recorded:

60kg 75kg 72kg 65kg 68kg

Test this at 5% level of significance. [6]

Expert Answer

mu=mean weight of adult man(in kg)

1	60	3600
2	75	5625
3	72	5184
4	65	4225
5	68	4624
Sum =	340	23258

Therefore, the sample mean is computed as shown below:

$$\bar{X} = \frac{1}{n}\sum_{i=1}^{n} X_i$$

$$= \frac{340}{5}$$

$$= 68$$

Therefore, based on the data provided, the sample mean is $\bar{X} = 68$.

Also, the sample variance s^2 is

$$s^2 = \frac{1}{n-1}\left(\sum_{i=1}^{n} X_i^2 - \frac{1}{n}\left(\sum_{i=1}^{n} X_i\right)^2\right)$$

$$= \frac{1}{5-1}\left(23258 - \frac{340^2}{5}\right)$$

$$= 34.5$$

Therefore, the sample standard deviation s is

$$s = \sqrt{s^2} = \sqrt{34.5} = 5.8737$$

Hypothesized Population Mean (μ) =	70
Sample Standard Deviation (s) =	5.8737
Sample Size (n) =	5
Sample Mean $(\bar{X})$ =	68
Significance Level (α) =	0.05

(1) *Null and Alternative Hypotheses*

The following null and alternative hypotheses need to be tested:

$$H_0 : \mu \leq 70$$

$$H_a : \mu > 70$$

This corresponds to a right-tailed test, for which a t-test for one mean, with

(2) *Rejection Region*

Based on the information provided, the significance level is $\alpha = 0.05$, and the critical value for a right-tailed test is $t_c = 2.132$.

The rejection region for this right-tailed test is $R = \{t : t > 2.132\}$

(3) *Test Statistics*

The t-statistic is computed as follows:

$$t = \frac{\bar{X} - \mu_0}{s/\sqrt{n}}$$

$$= \frac{68 - 70}{5.8737/\sqrt{5}}$$

$$= -0.761$$

(4) *Decision about the null hypothesis*

Since it is observed that $t = -0.761 \leq t_c = 2.132$, it is then concluded that *the null hypothesis is not rejected.*

Using the P-value approach: The p-value is $p = 0.7556$, and since $p = 0.7556 \geq 0.05$, it is concluded that the null hypothesis is not rejected.

(5) *Conclusion*

It is concluded that the null hypothesis Ho *is not rejected.* Therefore, there is not enough evidence to claim that the population mean μ is greater than 70, at the $\alpha = 0.05$ significance level.

hope this helps

Comment

Up next for you in Statistics and Probability

2) Suppose Solar power plants failures occur with an average of 5 failures

2) Suppose Solar power pl
every year, calculate the p
failure during a particular

See answer

QUESTION 1 A inspector wishes to estimate the percentage of the food items in a store that have passed the expiration date. It is believed that the

See answer

See more questions for subjects you study

Questions viewed by other students

Q: 5) Blood samples of 5 people were sent to each of two laboratories (Lab 1 and Lab 2) for cholesterol determinations. The resulting data are summarized here: Lab 1 276 270 265 300 280 Lab 2 318 287 285 262 296 Is there a statistically significant difference in the (population) mean cholesterol levels reported by Lab 1 and Lab 2? Test this at 5% level of significance. [6]

A: See answer 100% (1 rating)

Q: Case Study 1: Drive-Thru Service Times @ McDonald's (McDonalds Drive-Thru Waiting Times spreadsheet) When you're on the go and looking for a quick meal, where do you go? If you're like millions of people every day, you make a stop at McDonald's. Known as "quick service restaurants" in the industry (not "fast food"), companies such as McDonald's invest heavily to determine the most...

A: See answer