

Answer on Question #55616 – Math – Statistics and Probability

Two-sample T for MetRate

Sex	N	Mean	StDev	SEMean
Male	75	1626	227	26
Female	75	1258	172	20

Difference = μ (Male) - μ (Female)

Estimate for difference: 367.9

95% CI for difference: (****, ****)

T-Test of difference = 0 (vs \neq): T-Value = **** P-Value = **** DF = ****

Both use Pooled StDev = 201.5088

Is there a difference between the average metabolic rate of adolescent males and adolescent females?

Hypothesis Test:

Solution

We have $75 + 75 - 2 = 148$ degrees of freedom.

$$T^* = t_{148, \frac{1-0.95}{2}} = t_{148, 0.025} = 1.9761.$$

A 95% confidence interval to estimate the difference between the average MetRate of males and females is

$$\begin{aligned} CI &= \left(367.9 - 1.9761 \cdot 201.5088 \sqrt{\frac{1}{75} + \frac{1}{75}}; 367.9 + 1.9761 \cdot 201.5088 \sqrt{\frac{1}{75} + \frac{1}{75}} \right) \\ &= (302.87; 432.93) \end{aligned}$$

This confidence interval doesn't include zero, so we can say that there is a difference between the average metabolic rate of adolescent males and adolescent females.

Using Hypothesis Test:

$$H_0: \mu_1 - \mu_2 = 0; H_a: \mu_1 - \mu_2 \neq 0$$

$$T - Value = \frac{367.9}{201.5088 \sqrt{\frac{1}{75} + \frac{1}{75}}} = 11.180.$$

From t-table we can see

$$p - value < 0.001.$$

So we can reject the null hypothesis at 0.1% significance level and conclude that there is a difference between the average metabolic rate of adolescent males and adolescent females.