

Practical No. 06

Aim: Below are given the gain in weights of pig fed in two diets A and B. Gain in weight using:

Diet A: 25, 32, 30, 34, 24, 14, 32, 24, 30, 31, 35, 25

Diet B: 44, 34, 22, 10, 47, 31, 40, 30, 32, 35, 18, 21, 35, 29, 22

Write a python program to test if two diets differ significantly as regards their effect on increase in weight.

S/W Required: Python 3.9, Jupyter Notebook

Theory:

For this practical we are going to look at Two Sample T-Test (Independent). The 'AB' sample t-test (also known as the independent sample t-test) is a method used to test whether the unknown population means of two groups are equal or not.

You can use the test when your data values are independent and are randomly sampled from two normal populations and the two independent groups have equal variables.

Assumptions:

1. Variance of two populations should be same
2. Size of sample should be less than 30
3. Population should be normally distributed

Steps:

1. State the Null and Alternative Hypothesis
2. State the value of alpha (level of significance)
3. State decision rule
4. Calculate test statistics
5. State result
6. State conclusion

Calculate T – Statistics by using the following equation:

$$t = \frac{\bar{x}_1 + \bar{x}_2}{S} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

Where,

\bar{x}_1 – Mean of first sample

\bar{x}_2 – Mean of second sample

n_1 – Number of records in first sample

n_2 – Number of records in second sample

To calculate the S there are three methods, among which we are going to use the Actual Mean method.

$$S = \sqrt{\frac{\sum(x_1 - \bar{x}_1)^2 + \sum(x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}}$$

Code/Program:

Conclusion:

Thus, we have studied how to calculate t-statistics and perform the hypothesis test using t-test.