

What is the process for calculating the p-value of a t-score in R?

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The process for calculating the p-value of a t-score in R involves several steps. First, the t-score must be calculated using the appropriate formula and the given data. Once the t-score is obtained, the corresponding degrees of freedom and significance level must be determined. Next, the p-value is calculated using the cumulative distribution function (CDF) of the t-distribution with the degrees of freedom and the t-score as parameters. This value is then compared to the chosen significance level to determine the statistical significance of the t-score. In R, this can be done using the function `pt()`, which calculates the probability under the t-distribution curve. The resulting p-value can be interpreted as the probability of obtaining a t-score equal to or more extreme than the calculated t-score, assuming the null hypothesis is true. This process is used in hypothesis testing to determine the significance of a t-score and make informed decisions about the data.

Calculate the P-Value of a T-Score in R

Often in statistics we're interested in determining the p-value associated with a certain t-score that results from a . If this p-value is below some significance level, we can reject the null hypothesis of our hypothesis test.

To find the p-value associated with a t-score in R, we can use the `pt()` function, which uses the following syntax:

```
pt(q, df, lower.tail = TRUE)
```

where:

q: The t-score

df: The degrees of freedom

lower.tail: If **TRUE**, the probability to the left of q in the t distribution is returned. If **FALSE**, the probability to the

right is returned. Default is TRUE.

The following examples illustrate how to find the p-value associated with a t-score for a left-tailed test, right-tailed test, and a two-tailed test.

Left-tailed test

Suppose we want to find the p-value associated with a t-score of -0.77 and $df = 15$ in a left-tailed hypothesis test.

#find p-value

`pt(q=-.77, df=15, lower.tail=TRUE)`

0.2266283

The p-value is 0.2266. If we use a significance level of $\alpha = 0.05$, we would fail to reject the null hypothesis of our hypothesis test because this p-value is not less than 0.05.

Right-tailed test

Suppose we want to find the p-value associated with a t-score of 1.87 and $df = 24$ in a right-tailed hypothesis test.

```
#find p-value
```

```
pt(q=1.87, df=24, lower.tail=FALSE)
```

```
0.03686533
```

The p-value is 0.0368. If we use a significance level of $\alpha = 0.05$, we would reject the null hypothesis of our hypothesis test because this p-value is less than 0.05.

Two-tailed test

Suppose we want to find the p-value associated with a t-score of 1.24 and $df = 22$ in a two-tailed hypothesis test.

```
#find two-tailed p-value
```

```
2*pt(q=1.24, df=22, lower.tail=FALSE)
```

```
0.228039
```

To find this two-tailed p-value we simply multiplied the one-tailed p-value by two.

The p-value is 0.2280. If we use a significance level of $\alpha = 0.05$, we would fail to reject the null hypothesis of our hypothesis test because this p-value is not less than

0.05.

You can also use this online to find p-values.

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