

# Statistics for Data Science and Business Analysis



**Online p-value  
calculators**

# What is a p-value calculator?

A p-value calculator is a software that has an input your test statistic, (and the degrees of freedom, if applicable) that returns the p-value for the test.

There are various online solutions, however, the one I would normally use is by socstatistics @

<http://www.socscistatistics.com>



# How to use the socstatistics online p-value calculator?

Step 1: Go to

<http://www.socscistatistics.com/pvalues/>

There are several choices available depending on the test you need.

Step 2: Choose the test applicable to your problem and click on the link.

In this course we cover Z-score, t-score and the F-ratio score.

The screenshot shows the 'Social Science Statistics' website. At the top, there is a navigation bar with links: Home, Statistical Calculators, Test Yourself Quizzes, Which Statistics Test?, Descriptive Statistics, P Value Calculators, Donate, About, and Contact. Below the navigation bar, there are four buttons: AdChoices, P Value (highlighted), SPSS Statistics, and Formula to Calculate. The main content area is titled 'Quick P-Value Calculators' and includes a description: 'This is a set of very simple calculators that generate p-values from various test scores (i.e., t test, chi-square, etc).' Below this, there is a list of five options with arrows pointing to them from the right:

- P-value from Z score. (Arrow from 'Z-score, Normal distribution')
- P-value from t score. (Arrow from 't-score, Student's T distribution')
- P-value from chi-square score.
- P-value from F-ratio score. (Arrow from 'F-ratio score, F distribution')
- P-value from Pearson (r) score.

At the bottom right of the page, there is a logo for '365 DataScience'.

# P-value from Z-score

**Step 1:** Type in the Z-score you got from your test.

**Step 2 (optional):** Choose the significance level, if you want to get the result for your test.

**Step 3:** Choose if this is a one-tailed or two-tailed test.

**Step 4:** Click calculate.

The screenshot shows the 'P Value from Z Score Calculator' interface. It includes a navigation bar with links like 'Home', 'Statistical Calculators', and 'P Value Calculators'. Below the navigation bar are buttons for 'P Value Calculator', 'Z Score', and 'T Test Calculator'. The main section is titled 'P Value from Z Score Calculator' and contains instructions: 'This is very easy: just stick your Z score in the box marked Z score, select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!'. It also provides a link to a Z test calculator. The form has four input fields with arrows pointing to them from the right, labeled 'Step 1' through 'Step 4':  
1. 'Z score:' with an empty text box.  
2. 'Significance Level:' with radio buttons for 0.01, 0.05 (selected), and 0.10.  
3. 'One-tailed or two-tailed hypothesis?:' with radio buttons for One-tailed (selected) and Two-tailed.  
4. A 'Calculate' button.  
Below the form, it says 'Enter your z score value, and then press the button.'

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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AdChoices P Value Calculator Z Score T Test Calculator

### P Value from Z Score Calculator

This is very easy: just stick your Z score in the box marked Z score, select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!

If you need to derive a Z score from raw data, [you can find a Z test calculator here.](#)

Z score:  ← Step 1

Significance Level:

☐ 0.01  
☒ 0.05 ← Step 2  
☐ 0.10

One-tailed or two-tailed hypothesis?:

☒ One-tailed ← Step 3  
☐ Two-tailed

Enter your z score value, and then press the button.

Calculate ← Step 4

# P-value from Z-score

**Step 1:** Type in the Z-score you got from your test.

**Step 2 (optional):** Choose the significance level, if you want to get the decision for your test.

**Step 3:** Choose if this is a one-tailed or two-tailed test.

**Step 4:** Click calculate.

The screenshot shows the 'P Value from Z Score Calculator' interface. It includes a navigation bar with links like Home, Statistical Calculators, and P Value Calculators. The calculator section has input fields for Z score, Significance Level (0.01, 0.05, 0.10), and One-tailed or two-tailed hypothesis. A 'Calculate' button is at the bottom. Annotations with arrows point to these elements: Step 1 points to the Z score input, Step 2 points to the 0.05 significance level radio button, Step 3 points to the One-tailed hypothesis radio button, and Step 4 points to the Calculate button.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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### P Value from Z Score Calculator

This is very easy: just stick your Z score in the box marked Z score, select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!

If you need to derive a Z score from raw data, [you can find a Z test calculator here.](#)

Z score:  ← **Step 1**

Significance Level:

☐ 0.01  
☒ 0.05 ← **Step 2**  
☐ 0.10

One-tailed or two-tailed hypothesis?:

☒ One-tailed ← **Step 3**  
☐ Two-tailed

Enter your z score value, and then press the button.

Calculate ← **Step 4**

# P-value from Z-score. Example result (Part 1)

After clicking 'Calculate', you would instantly get two results.

**Result 1:** The p-value of the test.

**Result 2:** The decision, based on the information you entered above.

Note: When using this online p-value calculator, a **red** color of the text means that the result is **not significant**, given the significance level you have chosen.

Seth's Blog  
sethgodin.typepad.com

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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### P Value from Z Score Calculator

This is very easy: just stick your Z score in the box marked Z score, select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!

If you need to derive a Z score from raw data, [you can find a Z test calculator here.](#)

Z score:

Significance Level:

☐ 0.01  
☒ 0.05  
☐ 0.10

One-tailed or two-tailed hypothesis?:

☒ One-tailed  
☐ Two-tailed

The P-Value is 0.109349.

The result is not significant at p < 0.05.

Calculate

Result 1

Result 2

# P-value from Z-score. Example result (Part 2)

After clicking 'Calculate', you would instantly get two results.

**Result 1:** The p-value of the test.

**Result 2:** The decision, based on the information you entered above.

Note: When using this online p-value calculator, a **blue** color of the text means that the result is **significant**, given the significance level you have chosen.

The screenshot shows the 'P Value from Z Score Calculator' interface. At the top, there are navigation links: Home, Statistical Calculators, Test Yourself Quizzes, Which Statistics Test?, Descriptive Statistics, P Value Calculators, Donate, About, and Contact. Below these are buttons for 'AdChoices', 'P Value' (selected), 'Z Score', and 'T Test'. The main heading is 'P Value from Z Score Calculator'. A text block explains the process: 'This is very easy: just stick your Z score in the box marked Z score, select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!'. A link is provided: 'If you need to derive a Z score from raw data, you can find a Z test calculator here.' The 'Z score' input field contains '3.54'. The 'Significance Level' section has radio buttons for 0.01, 0.05 (selected), and 0.10. The 'One-tailed or two-tailed hypothesis?:' section has radio buttons for 'One-tailed' (selected) and 'Two-tailed'. The results are displayed in blue text: 'The P-Value is 0.0002.' and 'The result is significant at p < 0.05.'. A 'Calculate' button is at the bottom. Two arrows point from the text 'Result 1' and 'Result 2' to the two lines of blue result text.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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### P Value from Z Score Calculator

This is very easy: just stick your Z score in the box marked Z score, select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!

If you need to derive a Z score from raw data, you can find a Z test calculator here.

Z score:

Significance Level:

☐ 0.01  
☒ 0.05  
☐ 0.10

One-tailed or two-tailed hypothesis?:

☒ One-tailed  
☐ Two-tailed

The P-Value is 0.0002.

The result is significant at p < 0.05.

Calculate

Result 1

Result 2



# P-value from t-score

**Step 1:** Type in the t-score you got from your test.

**Step 2:** Type in the degrees of freedom associated with your test.

**Step 3 (optional):** Choose the significance level, if you want to get the decision for your test.

**Step 4:** Choose if this is a one-tailed or two-tailed test.

**Step 5:** Click calculate.

The screenshot shows the 'Social Science Statistics' website's 'P Value from T Score Calculator'. The page has a navigation bar with links: Home, Statistical Calculators, Test Yourself Quizzes, Which Statistics Test?, Descriptive Statistics, P Value Calculators, Donate, About, and Contact. Below the navigation bar are three tabs: 'AdChoices', 'P Value' (selected), 'T Test', and 'SPSS Statistics'. The main heading is 'P Value from T Score Calculator'. A text block explains the input requirements: 'This should be self-explanatory, but just in case it's not: your T Score goes in the T Score box, you stick your degrees of freedom in the DF box (N - 1 for single sample and dependent pairs, (N<sub>1</sub> - 1) + (N<sub>2</sub> - 1) for independent samples), select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!'. Below this is a link: 'If you need to derive a T Score from raw data, then you can find t test calculators here.' The form contains five input fields with arrows pointing to them from the right, labeled 'Step 1' through 'Step 5':

- Step 1:** T Score: [input box]
- Step 2:** DF: [input box]
- Step 3:** Significance Level: [radio buttons for .01, .05, .10]
- Step 4:** One-tailed or two-tailed hypothesis?: [radio buttons for One-tailed, Two-tailed]
- Step 5:** Calculate [button]

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# P-value from t-score. Example result (Part 1)

After clicking 'Calculate', you would instantly get two results.

**Result 1:** The p-value of the test.

**Result 2:** The decision, based on the information you entered above.

Note: When using this online p-value calculator, a **red** color of the text means that the result is **not significant**, given the significance level you have chosen.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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### P Value from T Score Calculator

This should be self-explanatory, but just in case it's not: your T Score goes in the T Score box, you stick your degrees of freedom in the DF box ( $N - 1$  for single sample and dependent pairs,  $(N_1 - 1) + (N_2 - 1)$  for independent samples), select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!

If you need to derive a T Score from raw data, [then you can find t test calculators here.](#)

T Score:

DF:

Significance Level:

☐ .01

☒ .05

☐ .10

One-tailed or two-tailed hypothesis?:

☒ One-tailed

☐ Two-tailed

The P-Value is .093417.

The result is not significant at  $p < .05$ .

Calculate

Result 1

Result 2

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# P-value from t-score. Example result (Part 2)

After clicking 'Calculate', you would instantly get two results.

**Result 1:** The p-value of the test.

**Result 2:** The decision, based on the information you entered above.

Note: When using this online p-value calculator, a **blue** color of the text means that the result is **significant**, given the significance level you have chosen.

The screenshot shows the 'Social Science Statistics' website's 'P Value from T Score Calculator'. The page has a navigation bar with links: Home, Statistical Calculators, Test Yourself Quizzes, Which Statistics Test?, Descriptive Statistics, P Value Calculators, Donate, About, and Contact. Below the navigation bar are three buttons: 'AdChoices', 'P Value' (selected), 'T Test', and 'SPSS Statistics'. The main heading is 'P Value from T Score Calculator'. Below this is a paragraph explaining the input requirements: 'This should be self-explanatory, but just in case it's not: your T Score goes in the T Score box, you stick your degrees of freedom in the DF box (N - 1 for single sample and dependent pairs, (N<sub>1</sub> - 1) + (N<sub>2</sub> - 1) for independent samples), select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!'. Below this is a link: 'If you need to derive a T Score from raw data, [then you can find t test calculators here.](#)'. The input fields are: 'T Score:' with a value of 3.5, 'DF:' with a value of 16, 'Significance Level:' with radio buttons for .01, .05 (selected), and .10, and 'One-tailed or two-tailed hypothesis?:' with radio buttons for One-tailed (selected) and Two-tailed. The results are displayed in blue text: 'The P-Value is .001482.' and 'The result is significant at p < .05.'. Below the results is a note: 'Note: If you wish to calculate the effect size, [this calculator](#) will do the job.' and a 'Calculate' button. Two arrows point from the results to labels on the right: 'Result 1' points to 'The P-Value is .001482.' and 'Result 2' points to 'The result is significant at p < .05.'.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

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### P Value from T Score Calculator

This should be self-explanatory, but just in case it's not: your T Score goes in the T Score box, you stick your degrees of freedom in the DF box (N - 1 for single sample and dependent pairs, (N<sub>1</sub> - 1) + (N<sub>2</sub> - 1) for independent samples), select your significance level and whether you're testing a one or two-tailed hypothesis (if you're not sure, go with the defaults), then press the button!

If you need to derive a T Score from raw data, [then you can find t test calculators here.](#)

T Score:

DF:

Significance Level:

☐ .01

☒ .05

☐ .10

One-tailed or two-tailed hypothesis?:

☒ One-tailed

☐ Two-tailed

The P-Value is .001482.

The result is significant at p < .05.

Note: If you wish to calculate the effect size, [this calculator](#) will do the job.

Calculate

Result 1

Result 2