

# How do you perform a One Sample t-Test in SAS?

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## RECOMMENDED CITATION

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The One Sample t-Test is a statistical tool used to determine if the mean of a single sample is significantly different from a known or hypothesized population mean. In order to perform this test in SAS, the following steps should be followed:

1. Define the research question and select the appropriate variables from the dataset.
2. Use the PROC TTEST procedure in SAS to specify the one sample t-test.
3. Specify the variables for the analysis and the population mean to be tested against.
4. Choose the appropriate test options such as confidence level and type of t-test (one-tailed or two-tailed).
5. Run the t-test and interpret the results, including the p-value and confidence interval.

It is important to ensure that the assumptions of the one sample t-test are met, such as normality and independence, before interpreting the results. By following these steps, one can effectively perform a One Sample t-Test in SAS and make informed conclusions about the mean of a single sample.

## Perform a One Sample t-Test in SAS

**A one sample t-test is used to determine whether or not the mean of a is equal to some value.**

**This tutorial explains how to perform a one sample t-test in SAS.**

**Example: One Sample t-Test in SAS**

**Suppose a botanist wants to know if the mean height of a certain species of plant is equal to 15 inches. She collects a of 12 plants and records each of their heights in inches.**

**The heights are as follows: 14, 14, 16, 13, 12, 17, 15, 14,**

**15, 13, 15, 14**

**Use the following steps to conduct a one sample t-test to determine if the mean height for this species of plant is actually equal to 15 inches.**

**Step 1: Create the data.**

**First, we'll use the following code to create the dataset in SAS:**

```
/*create dataset*/
```

```
data my_data;
```

```
input Height;
```

```
datalines;
```

```
14
```

```
14
```

```
16
```

```
13
```

```
12
```

```
17
```

```
15
```

```
14
```

```
15
```

```
13
```

**15**

**14**

**;**

**run;**

**/\*print dataset\*/**

**proc printdata=my\_data;**

Obs	Height
1	14
2	14
3	16
4	13
5	12
6	17
7	15
8	14
9	15
10	13
11	15
12	14

**Step 2: Perform a one sample t-test.**

**Next, we'll use proc ttest to perform the one sample t-test:**

**/\*perform one sample t-test\*/**

**proc ttestdata=my\_data sides=2alpha=0.05h0=15;**

```
var Height;
run;
```

**The TTEST Procedure**

Variable: Height

N	Mean	Std Dev	Std Err	Minimum	Maximum
12	14.3333	1.3707	0.3957	12.0000	17.0000

  

Mean	95% CL Mean	Std Dev	95% CL Std Dev
14.3333	13.4624 15.2042	1.3707	0.9710 2.3273

  

DF	t Value	Pr >  t
11	-1.68	0.1201

The first table displays descriptive statistics for our sample, including:

**N (total observations): 12**  
**Mean (sample mean): 14.3333**  
**Std Dev (sample standard deviation): 1.3707**  
**Std Error (standard error, calculated as  $s/\sqrt{n}$ ): .3957**  
**Minimum (the minimum value): 12**  
**Maximum (the maximum value) 17**

The second table displays the 95% for the true population mean:

**95% C.I. for  $\mu$ :**

**The third table displays the t test statistic and corresponding p-value:**

**t test statistic: -1.68 p-value: 0.1201**

**Note: The t test statistic was calculated as:**

**t test statistic =  $(x - \mu) / (s/\sqrt{n})$  t test statistic =  $(14.3333-15) / (1.3707/\sqrt{12})$  t test statistic = -1.68**

**Recall that the one sample t-test uses the following null and alternative hypotheses:**

**H0:  $\mu = 15$  inches HA:  $\mu \neq 15$  inches**

**Since the p-value (.1201) is not less than .05, we fail to reject the null hypothesis.**

**This means we do not have sufficient evidence to say that the mean height of this certain species of plant is different than 15 inches.**

**Additional Resources**

**The following tutorials explain how to perform other common statistical tests in SAS:**