

# t-Test

## Student's T-Test

The `t.test()` function can be used to perform both one and two sample t-tests on vectors of data. The function contains a variety of arguments and is called as follows:

```
t.test(x, y = NULL, alternative =  
c("two.sided", "less", "greater"), mu = 0,  
      paired = FALSE, var.equal = FALSE,  
conf.level = 0.95)
```

## Example

```
t.test(x, alternative = "less", mu = 25)
```

...performs a one-sample t-test on the data contained in `x` where the null hypothesis is that  $\mu=25$  and the alternative is that  $\mu<25$ .

1. An outbreak of salmonella-related illness was attributed to ice produced at a certain factory. Scientists measured the level of Salmonella in 9 randomly sampled batches ice cream. The levels (in MPN/g) were:

0.593	0.142	0.329	0.691	0.231	0.793	0.519	0.392	0.418
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Is there evidence that the mean level of Salmonella in ice cream greater than 0.3 MPN/g?

2. Suppose that 10 volunteers have taken an intelligence test; here are the results obtained. The average score of the entire population is 75 in the same test. Is there any significant difference (with a significance level of 95%) between the sample and population means, assuming that the variance of the population is not known.

Scores: 65, 78, 88, 55, 48, 95, 66, 57, 79, 81

3. Comparing two independent sample means, taken from two populations with unknown variance. The following data shows the heights of individuals of two different countries with unknown population variances. Is there any significant difference b/n the average heights of two groups.

A:	175	168	168	190	156	181	182	175	174	179
B:	185	169	173	173	188	186	175	174	179	180