**Calculation of the Related Samples *t* test**

 This test is appropriate whenever data have collected in a way that results in the two samples of scores being related to each other. Suppose that Farmer Sol is evaluating the yield of two varieties of cucumbers that produce superior fruits, the SuperCuke and the Cukazilla. He has 12 small plots of land on which he is going to plant cucumbers. Each plot is split into two halves, and one half is planted with SuperCukes and the other half with Cukazilla, with assignment to halves, within each plot, being made randomly. Sol records how many bushels of cucumbers he harvests from each split plot. Here are the data.

|  |  |  |  |
| --- | --- | --- | --- |
| Plot | SuperCuke | Cukazilla | Difference |
| A | 1.4 | 1.6 | .2 |
| B | 1.8 | 1.8 | .0 |
| C | 2.3 | 2.2 | -.1 |
| D | 2.7 | 2.7 | .0 |
| E | 3.3 | 3.4 | .1 |
| F | 3.4 | 3.7 | .3 |
| G | 3.8 | 3.5 | -.3 |
| H | 4.1 | 4.4 | .3 |
| I | 4.7 | 5.0 | .3 |
| J | 4.9 | 5.1 | .2 |
| K | 5.8 | 6.1 | .3 |
| L | 6.0 | 6.5 | .5 |
| Mean | 3.683 | 3.833 | 0.15 |
| *SD* | 1.4899 | 1.6216 | .2195 |

 Since the data appear to be approximately normally distributed, Sol decides to employ a related samples *t* test to determine whether or not there is a significant difference between the two types of cucumbers, with respect to yield.



 A table in the back of Sol’s stats text tells him that on 11 degrees of freedom one has to obtain a *t* whose absolute value is at least 2.201 to claim significance at the traditional .05 level. Since Sol’s obtained *t* exceeds that critical value, he concludes that the yield of Cukazilla cucumbers is significantly greater than that of Supercuke cucumbers.