TI-83/84 Hypothesis Testing: Two Dependent Sample Means

For inferences from dependent samples (matched or paired), do not use the TI-83/84 menus for 2-SampTtest or 2-SampTInt, since they are designed for independent samples only. To conduct two sample hypothesis tests for means from dependent samples, you must first create a list for the difference of the values in the two samples and then use TTest for the single difference column.

Compare two means from dependent samples:

Example: The table below gives the number of steps taken in a day for a sample of 9 husband and wife pairs. Conduct a test at the 10% level of significance to determine if the mean difference in the number of steps taken is different than 0.

Husband	900	600	850	1200	900	950	1050	1100	850
Wife	700	800	650	1100	950	850	900	1050	800

Procedure: For this test we will be using a single sample T-test since the differences for dependent paired data follow a t-distribution with $n-1$ degrees of freedom. In this case $H_o: \mu_d = 0$ and $H_a: \mu_d \neq 0$. To test:

- Press the **STAT** button on your calculator
- Leave the **EDIT** menu highlighted

- Highlight and select **1:Edit** with the **ENTER** button
- Enter the list of husband data into L_1 and the list of wife data into L_2
- Highlight L_3 (put curser on the top of "L_3" and enter the equation $L_1 - L_2$ (to generate a column of the difference between the values in each of these columns) type: **2nd** **1**

  - **2nd** **2** to enter the equation.

- Press **STAT** on your calculator

- Use the arrow key to move over to the **TESTS** menu

- From this menu select **2:TTest** by typing ⟨2⟩ or highlighting the 2 and pressing ⟨ENTER⟩ :

- In the menu that comes up highlight **Data** and press ⟨ENTER⟩

- Enter ⟨0⟩ for the population mean

- Enter L₃ next to List

- Make sure that **Freq**: is set to 1

- Select the appropriate test type based on your alternative hypothesis (in this case ≠)

- Highlight **Calculate** and press the ⟨ENTER⟩ key:

```
EDIT CALC TESTS   T-Test               T-Test
1:Z-Test...        Inpt:DATA Stats      μ≠0
2:T-Test...        μ₀:0                  t=1.568929081
3:2-SampZTest...   List:L₃              p=.1553029036
4:2-SampTTest...   Freq:1               x̄=66.66666667
5:1-PropZTest...   μ:≠μ₀ <μ₀ >μ₀        Sx=127.4754878
6:2-PropZTest...        Draw            n=9
7↓ZInterval...
```

You can now complete your hypothesis test either by comparing the test statistic (t) to critical values or by comparing the P-value to the α level given in the problem. In this case, since the P-value ($P = 0.155$) is greater than the α level given (0.10) we fail to reject H$_o$ and can say that at the 10% level of signifigance there is not enough evidence to say that the mean difference in the number of steps taken by husbands and wives is different than 0.