Getting Started: Mean Height of a Population

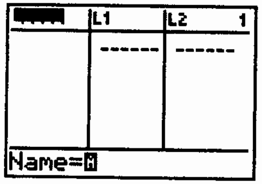
Getting Started is a fast-paced introduction. Read the chapter for details.

Suppose you want to estimate the mean height of a population of women given the random sample below. Because heights among a biological population tend to be normally distributed, a *t* distribution confidence interval can be used when estimating the mean. The 10 height values below are the first 10 of 90 values, randomly generated from a normally distributed population with an assumed mean of 165.1 centimetres and a standard deviation of 6.35 centimetres (randNorm(165.1,6.35,90) with a seed of 789).

Height (in centimetres) of Each of 10 Women

169.43 168.33 159.55 169.97 159.79 181.42 171.17 162.04 167.15 159.53

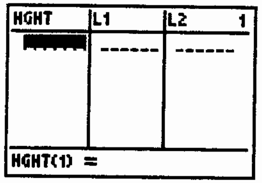
1. Press [STAT] [ENTER] to display the stat list editor.



   Press [▲] to move the cursor onto **L1**, and then press [2nd] [INS]. The **Name=** prompt is displayed on the bottom line. The **A** cursor indicates that alpha-lock is on. The existing list name columns shift to the right.

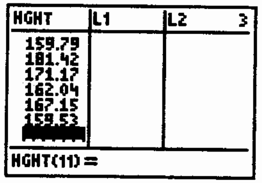
   Note: Your stat editor may not look like the one pictured here, depending on the lists you have already stored.

2. Enter [H] [G] [H] [T] at the **Name=** prompt, and then press [ENTER]. The list to which you will store the women's height data is created.



   Press [▼] to move the cursor onto the first row of the list. **HGHT(1)=** is displayed on the bottom line.

3. Press **169** [.] **43** to enter the first height value. As you enter it, it is displayed on the bottom line.

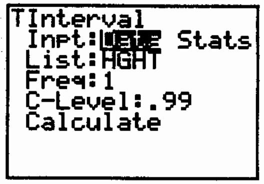


   Press [ENTER]. The value is displayed in the first row, and the rectangular cursor moves to the next row.

   Enter the other nine height values the same way.

4. Press [STAT] [◄] to display the STAT TESTS menu, and then press [▼] until **8:TInterval** is highlighted.

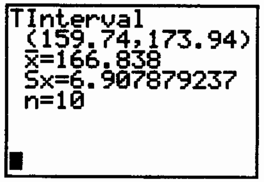
5. Press [ENTER] to select **8:TInterval**. The inferential stat editor for **TInterval** is displayed. If **Data** is not selected for **Inpt:**, press [◄] [ENTER] to select **Data**.



   Press [▼] and [H] [G] [H] [T] at the **List:** prompt (alpha-lock is on).

   Press [▼] [▼] [.] **99** to enter a 99 percent confidence level at the **C-Level:** prompt.

6. Press [▼] to move the cursor onto **Calculate**, and then press [ENTER]. The confidence interval is calculated, and the **TInterval** results are displayed on the home screen.



Interpret the results.

The first line, **(159.74,173.94)**, shows that the 99 percent confidence interval for the population mean is between about 159.74 centimetres and 173.94 centimetres. This is about a 14.2 centimetres spread.

The .99 confidence level indicates that in a very large number of samples, we expect 99 percent of the intervals calculated to contain the population mean. The actual mean of the population sampled is 165.1 centimetres (introduction; page 13-2), which is in the calculated interval.

The second line gives the mean height of the sample $\bar{x}$ used to compute this interval. The third line gives the sample standard deviation **Sx**. The bottom line gives the sample size **n**.

To obtain a more precise bound on the population mean μ of women's heights, increase the sample size to 90. Use a sample mean $\bar{x}$ of 163.8 and sample standard deviation **Sx** of 7.1 calculated from the larger random sample (introduction; page 13-2). This time, use the **Stats** (summary statistics) input option.

7. Press [STAT] [◄] **8** to display the inferential stat editor for **TInterval**.

   Press [►] [ENTER] to select **Inpt:Stats**. The editor changes so that you can enter summary statistics as input.

```
TInterval
 Inpt:Data Stats
 x̄:166.838
 Sx:6.907879237…
 n:10
 C-Level:.99
 Calculate
```

8. Press [▼] **163** [.] **8** [ENTER] to store 163.8 to $\bar{x}$.

   Press **7** [.] **1** [ENTER] to store 7.1 to **Sx**.

   Press **90** [ENTER] to store 90 to **n**.

```
TInterval
 Inpt:Data Stats
 x̄:163.8
 Sx:7.1
 n:90
 C-Level:.99
 Calculate
```

9. Press [▼] to move the cursor onto **Calculate**, and then press [ENTER] to calculate the new 99 percent confidence interval. The results are displayed on the home screen.

```
TInterval
 (161.83,165.77)
 x̄=163.8
 Sx=7.1
 n=90
█
```

If the height distribution among a population of women is normally distributed with a mean μ of 165.1 centimetres and a standard deviation σ of 6.35 centimetres, what height is exceeded by only 5 percent of the women (the 95th percentile)?

10. Press [CLEAR] to clear the home screen.

    Press [2nd] [DISTR] to display the DISTR (distributions) menu.

```
DISTR DRAW
1:normalpdf(
2:normalcdf(
3:invNorm(
4:tpdf(
5:tcdf(
6:χ²pdf(
7↓χ²cdf(
```

11. Press **3** to paste **invNorm(** to the home screen.

    Press [.] **95** [,] **165** [.] **1** [,] **6** [.] **35** [)] [ENTER].

    .95 is the area, **165.1** is μ, and **6.35** is σ.

```
invNorm(.95,165.
1,6.35)
        175.5448205
█
```

The result is displayed on the home screen; it shows that five percent of the women are taller than 175.5 centimetres.

Now graph and shade the top 5 percent of the population.

12. Press [WINDOW] and set the window variables to these values.

Xmin=145	**Ymin=-.02**	**Xres=1**
Xmax=185	**Ymax=.08**	
Xscl=5	**Yscl=0**	

```
WINDOW
 Xmin=145
 Xmax=185
 Xscl=5
 Ymin=-.02
 Ymax=.08
 Yscl=0
 Xres=1
```

13. Press [2nd] [DISTR] [►] to display the DISTR DRAW menu.

```
DISTR DRAW
1:ShadeNorm(
2:Shade_t(
3:Shadeχ²(
4:ShadeF(
```

14. Press [ENTER] to paste **ShadeNorm(** to the home screen.

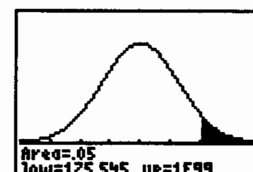
    Press [2nd] [ANS] [,] **1** [2nd] [EE] **99** [,] **165** [.] **1** [,] **6** [.] **35** [)].

    Ans (175.5448205 from step 11) is the lower bound. 1E99 is the upper bound. The normal curve is defined by a mean μ of 165.1 and a standard deviation σ of 6.35.

```
invNorm(.95,165.
1,6.35)
        175.5448205
ShadeNorm(Ans,1E
99,165.1,6.35)█
```

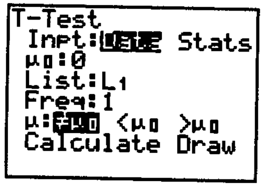
15. Press [ENTER] to plot and shade the normal curve.

    Area is the area above the 95th percentile. **low** is the lower bound. **up** is the upper bound.



Displaying the Inferential Stat Editors

When you select a hypothesis test or confidence interval instruction from the home screen, the appropriate inferential statistics editor is displayed. The editors vary according to each test or interval's input requirements. Below is the inferential stat editor for **T-Test**.



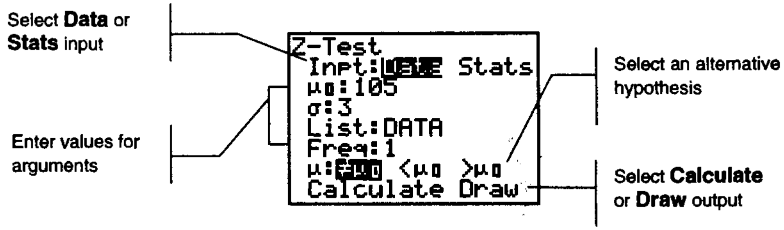
Note: When you select the **ANOVA(** instruction, it is pasted to the home screen. **ANOVA(** does not have an editor screen.

Using an Inferential Stat Editor

To use an inferential stat editor, follow these steps.

1. Select a hypothesis test or confidence interval from the STAT TESTS menu. The appropriate editor is displayed.
2. Select **Data** or **Stats** input, if the selection is available. The appropriate editor is displayed.
3. Enter real numbers, list names, or expressions for each argument in the editor.
4. Select the alternative hypothesis (≠, <, or >) against which to test, if the selection is available.
5. Select **No** or **Yes** for the **Pooled** option, if the selection is available.
6. Select **Calculate** or **Draw** (when **Draw** is available) to execute the instruction.
   - When you select **Calculate**, the results are displayed on the home screen.
   - When you select **Draw**, the results are displayed in a graph.

This chapter describes the selections in the above steps for each hypothesis test and confidence interval instruction.



Selecting Data or Stats

Most inferential stat editors prompt you to select one of two types of input. (**1-PropZInt** and **2-PropZTest**, **1-PropZInt** and **2-PropZInt**, χ^2**-Test**, and **LinRegTTest** do not.)

- Select **Data** to enter the data lists as input.
- Select **Stats** to enter summary statistics, such as $\bar{x}$, **Sx**, and **n**, as input.

To select **Data** or **Stats**, move the cursor to either **Data** or **Stats**, and then press [ENTER].

Entering the Values for Arguments

Inferential stat editors require a value for every argument. If you do not know what a particular argument symbol represents, see the tables on pages 13-26 and 13-27.

When you enter values in any inferential stat editor, the TI-83 Plus stores them in memory so that you can run many tests or intervals without having to reenter every value.

Selecting an Alternative Hypothesis (≠ < >)

Most of the inferential stat editors for the hypothesis tests prompt you to select one of three alternative hypotheses.

- The first is a ≠ alternative hypothesis, such as **μ≠μ0** for the **Z-Test**.
- The second is a < alternative hypothesis, such as **μ1<μ2** for the **2-SampTTest**.
- The third is a > alternative hypothesis, such as **p1>p2** for the **2-PropZTest**.

To select an alternative hypothesis, move the cursor to the appropriate alternative, and then press [ENTER].

Selecting the Pooled Option

Pooled (**2-SampTTest** and **2-SampTInt** only) specifies whether the variances are to be pooled for the calculation.

- Select **No** if you do not want the variances pooled. Population variances can be unequal.
- Select **Yes** if you want the variances pooled. Population variances are assumed to be equal.

To select the **Pooled** option, move the cursor to **Yes**, and then press [ENTER].

Selecting Calculate or Draw for a Hypothesis Test

After you have entered all arguments in an inferential stat editor for a hypothesis test, you must select whether you want to see the calculated results on the home screen (**Calculate**) or on the graph screen (**Draw**).

- **Calculate** calculates the test results and displays the outputs on the home screen.
- **Draw** draws a graph of the test results and displays the test statistic and p-value with the graph. The window variables are adjusted automatically to fit the graph.

To select **Calculate** or **Draw**, move the cursor to either **Calculate** or **Draw**, and then press [ENTER]. The instruction is immediately executed.

Selecting Calculate for a Confidence Interval

After you have entered all arguments in an inferential stat editor for a confidence interval, select **Calculate** to display the results. The **Draw** option is not available.

When you press [ENTER], **Calculate** calculates the confidence interval results and displays the outputs on the home screen.

Bypassing the Inferential Stat Editors

To paste a hypothesis test or confidence interval instruction to the home screen without displaying the corresponding inferential stat editor, select the instruction you want from the CATALOG menu. Appendix A describes the input syntax for each hypothesis test and confidence interval instruction.

```
2-SampZTest(
```

Note: You can paste a hypothesis test or confidence interval instruction to a command line in a program. From within the program editor, select the instruction from either the CATALOG (Chapter 15) or the STAT TESTS menu.

STAT TESTS Menu

STAT TESTS Menu

To display the STAT TESTS menu, press [STAT] [◄]. When you select an inferential statistics instruction, the appropriate inferential stat editor is displayed.

Most STAT TESTS instructions store some output variables to memory. Most of these output variables are in the TEST secondary menu (VARS menu; **5:Statistics**). For a list of these variables, see page 13-28.

EDIT CALC TESTS	
1: Z-Test...	Test for 1 μ, known σ
2: T-Test...	Test for 1 μ, unknown σ
3: 2-SampZTest...	Test comparing 2 μ's, known σ's
4: 2-SampTTest...	Test comparing 2 μ's, unknown σ's
5: 1-PropZTest...	Test for 1 proportion
6: 2-PropZTest...	Test comparing 2 proportions
7: ZInterval...	Confidence interval for 1 μ, known σ
8: TInterval...	Confidence interval for 1 μ, unknown σ
9: 2-SampZInt...	Confidence interval for difference of 2 μ's, known σ's
0: 2-SampTInt...	Confidence interval for difference of 2 μ's, unknown σ's
A: 1-PropZInt...	Confidence interval for 1 proportion
B: 2-PropZInt...	Confidence interval for difference of 2 proportions
C: χ2-Test...	Chi-square test for 2-way tables
D: 2-SampFTest...	Test comparing 2 σ's
E: LinRegTTest...	*t* test for regression slope and ρ
F: ANOVA(	One-way analysis of variance

Note: When a new test or interval is computed, all previous output variables are invalidated.

Inferential Stat Editors for the STAT TESTS Instructions

In this chapter, the description of each STAT TESTS instruction shows the unique inferential stat editor for that instruction with example arguments.

- Descriptions of instructions that offer the **Data/Stats** input choice show both types of input screens.
- Descriptions of instructions that do not offer the **Data/Stats** input choice show only one input screen.

The description then shows the unique output screen for that instruction with the example results.

- Descriptions of instructions that offer the **Calculate/Draw** output choice show both types of screens: calculated and graphic results.
- Descriptions of instructions that offer only the **Calculate** output choice show the calculated results on the home screen.

Z-Test

Z-Test (one-sample *z* test; item **1**) performs a hypothesis test for a single unknown population mean μ when the population standard deviation σ is known. It tests the null hypothesis H_0: $\mu=\mu_0$ against one of the alternatives below.

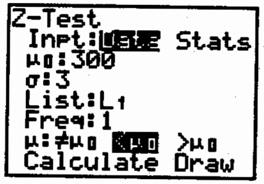
- H_a: $\mu\neq\mu_0$ (μ:≠μ0)
- H_a: $\mu<\mu_0$ (μ:<μ0)
- H_a: $\mu>\mu_0$ (μ:>μ0)

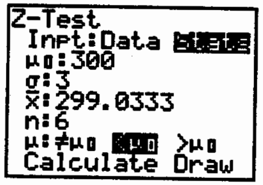
In the example:

L1={299.4 297.7 301 298.9 300.2 297}

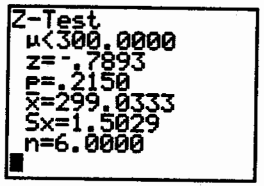
Data / Stats

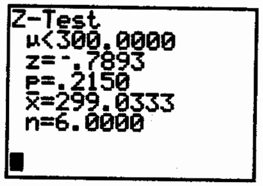
Input:



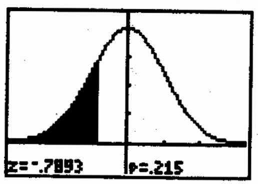


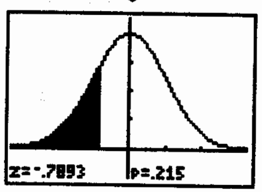
Calculated results:





Drawn results:





Note: All examples on pages13-10 through 13-25 assume a fixed-decimal mode setting of **4** (Chapter 1). If you set the decimal mode to **Float** or a different fixed-decimal setting, your output may differ from the output in the examples.

T-Test

T-Test (one-sample *t* test; item **2**) performs a hypothesis test for a single unknown population mean μ when the population standard deviation σ is unknown. It tests the null hypothesis H_0: $\mu=\mu_0$ against one of the alternatives below.

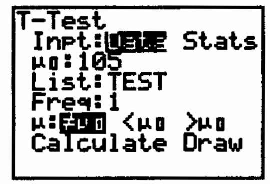
- H_a: $\mu\neq\mu_0$ (μ:≠μ0)
- H_a: $\mu<\mu_0$ (μ:<μ0)
- H_a: $\mu>\mu_0$ (μ:>μ0)

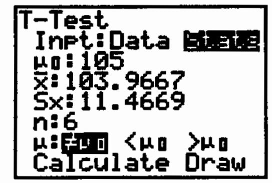
In the example:

TEST={91.9 97.8 111.4 122.3 105.4 95}

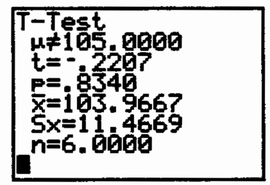
Data / Stats

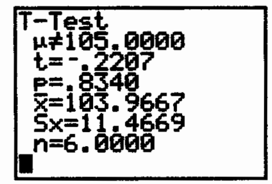
Input:



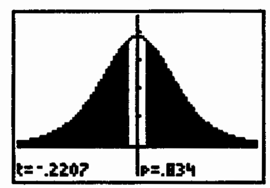


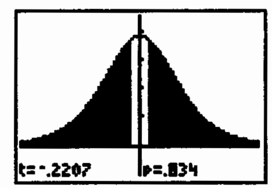
Calculated results:





Drawn results:





2-SampZTest

2-SampZTest (two-sample *z* test; item **3**) tests the equality of the means of two populations (μ_1 and μ_2) based on independent samples when both population standard deviations (σ_1 and σ_2) are known. The null hypothesis H_0: $\mu_1=\mu_2$ is tested against one of the alternatives below.

- H_a: $\mu_1 \neq \mu_2$ (**μ1:≠μ2**)
- H_a: $\mu_1 < \mu_2$ (**μ1:<μ2**)
- H_a: $\mu_1 > \mu_2$ (**μ1:>μ2**)

In the example:

LISTA={154 109 137 115 140}
LISTB={108 115 126 92 146}

Input:

Data
```
2-SampZTest
 Inpt:Data Stats
 σ1:15.5
 σ2:13.5
 List1:LISTA
 List2:LISTB
 Freq1:1
↓Freq2:1

 μ1:≠μ2 <μ2 >μ2
 Calculate Draw
```

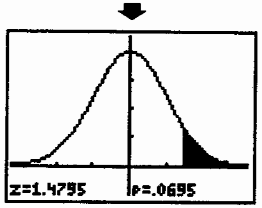
Stats
```
2-SampZTest
 Inpt:Data Stats
 σ1:15.5
 σ2:13.5
 x̄1:131
 n1:5
 x̄2:117.4
↓n2:5

 μ1:≠μ2 <μ2 >μ2
 Calculate Draw
```

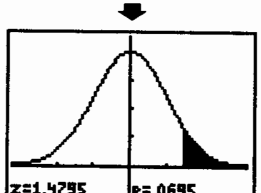
Calculated results:

Data
```
2-SampZTest
 μ1>μ2
 z=1.4795
 p=.0695
 x̄1=131.0000
 x̄2=117.4000
↓Sx1=18.6145

 Sx2=20.1941
 n1=5.0000
 n2=5.0000
```

Stats
```
2-SampZTest
 μ1>μ2
 z=1.4795
 p=.0695
 x̄1=131.0000
 x̄2=117.4000
↓n1=5.0000

 n2=5.0000
```

Drawn results:





2-SampTTest

2-SampTTest (two-sample *t* test; item **4**) tests the equality of the means of two populations (μ_1 and μ_2) based on independent samples when neither population standard deviation (σ_1 or σ_2) is known. The null hypothesis H_0: $\mu_1=\mu_2$ is tested against one of the alternatives below.

- H_a: $\mu_1 \neq \mu_2$ (**μ1:≠μ2**)
- H_a: $\mu_1 < \mu_2$ (**μ1:<μ2**)
- H_a: $\mu_1 > \mu_2$ (**μ1:>μ2**)

In the example:

SAMP1={12.207 16.869 25.05 22.429 8.456 10.589}
SAMP2={11.074 9.686 12.064 9.351 8.182 6.642}

Input:

Data
```
2-SampTTest
 Inpt:Data Stats
 List1:SAMP1
 List2:SAMP2
 Freq1:1
 Freq2:1
 μ1:≠μ2 <μ2 >μ2
↓Pooled:No Yes

 Calculate Draw
```

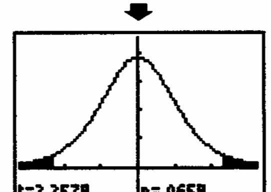
Stats
```
2-SampTTest
 Inpt:Data Stats
 x̄1:15.9333
 Sx1:6.7014
 n1:6
 x̄2:9.4998
 Sx2:1.9501
↓n2:6

 μ1:≠μ2 <μ2 >μ2
 Pooled:No Yes
 Calculate Draw
```

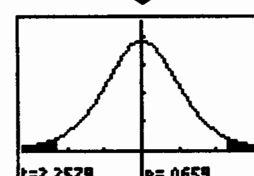
Calculated results:

Data
```
2-SampTTest
 μ1≠μ2
 t=2.2579
 p=.0659
 df=5.8408
 x̄1=15.9333
↓x̄2=9.4998

 Sx1=6.7014
 Sx2=1.9501
 n1=6.0000
 n2=6.0000
```

Stats
```
2-SampTTest
 μ1≠μ2
 t=2.2579
 p=.0659
 df=5.8408
 x̄1=15.9333
↓x̄2=9.4998

 Sx1=6.7014
 Sx2=1.9501
 n1=6.0000
 n2=6.0000
```

Drawn results:





1-PropZTest

1-PropZTest (one-proportion z test; item **5**) computes a test for an unknown proportion of successes (prop). It takes as input the count of successes in the sample x and the count of observations in the sample n. **1-PropZTest** tests the null hypothesis H_0: prop=p_0 against one of the alternatives below.

- H_a: prop≠p_0 (**prop:≠p0**)
- H_a: prop<p_0 (**prop:<p0**)
- H_a: prop>p_0 (**prop:>p0**)

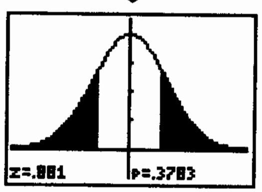
Input:

```
1-PropZTest
 p0:.5
 x:2048
 n:4040
 prop≠p0 <p0 >p0
 Calculate Draw
```

Calculated results:

```
1-PropZTest
 prop≠.5000
 z=.8810
 p=.3783
 p̂=.5069
 n=4040.0000
```

Drawn results:



2-PropZTest

2-PropZTest (two-proportion z test; item **6**) computes a test to compare the proportion of successes (p_1 and p_2) from two populations. It takes as input the count of successes in each sample (x_1 and x_2) and the count of observations in each sample (n_1 and n_2). **2-PropZTest** tests the null hypothesis H_0: p_1=p_2 (using the pooled sample proportion $\hat{p}$) against one of the alternatives below.

- H_a: p_1≠p_2 (**p1:≠p2**)
- H_a: p_1<p_2 (**p1:<p2**)
- H_a: p_1>p_2 (**p1:>p2**)

Input:

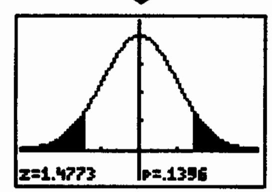
```
2-PropZTest
 x1:45
 n1:61
 x2:38
 n2:62
 p1:≠p2 <p2 >p2
 Calculate Draw
```

Calculated results:

```
2-PropZTest
 p1≠p2
 z=1.4773
 p=.1396
 p̂1=.7377
 p̂2=.6129
↓p̂=.6748
```

```
 n1=61.0000
 n2=62.0000
```

Drawn results:



ZInterval

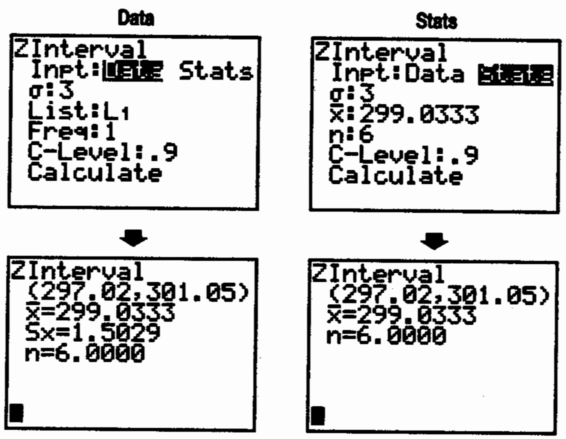
ZInterval (one-sample z confidence interval; item 7) computes a confidence interval for an unknown population mean μ when the population standard deviation σ is known. The computed confidence interval depends on the user-specified confidence level.

In the example:

L1={299.4 297.7 301 298.9 300.2 297}

Input:

Calculated results:



TInterval

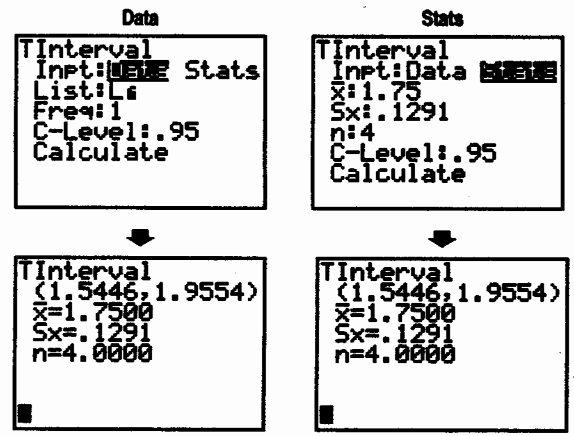
TInterval (one-sample t confidence interval; item 8) computes a confidence interval for an unknown population mean μ when the population standard deviation σ is unknown. The computed confidence interval depends on the user-specified confidence level.

In the example:

L6={1.6 1.7 1.8 1.9}

Input:

Calculated results:



2-SampZInt

2-SampZInt (two-sample z confidence interval; item **9**) computes a confidence interval for the difference between two population means ($\mu_1 - \mu_2$) when both population standard deviations (σ_1 and σ_2) are known. The computed confidence interval depends on the user-specified confidence level.

In the example:

LISTC={154 109 137 115 140}
LISTD={108 115 126 92 146}

Input:

Data

```
2-SampZInt
 Inpt:Data Stats
 σ1:15.5
 σ2:13.5
 List1:LISTC
 List2:LISTD
 Freq1:1
↓Freq2:1
```

```
 C-Level:.99
 Calculate
```

Stats

```
2-SampZInt
 Inpt:Data Stats
 σ1:15.5
 σ2:13.5
 x̄1:131
 n1:5
 x̄2:117.4
↓n2:5
```

```
 C-Level:.99
 Calculate
```

Calculated results:

```
2-SampZInt
 (-10.08,37.278)
 x̄1=131.0000
 x̄2=117.4000
 Sx1=18.6145
 Sx2=20.1941
↓n1=5.0000
```

```
 n2=5.0000
```

```
2-SampZInt
 (-10.08,37.278)
 x̄1=131.0000
 x̄2=117.4000
 n1=5.0000
 n2=5.0000
```

2-SampTInt

2-SampTInt (two-sample t confidence interval; item **0**) computes a confidence interval for the difference between two population means ($\mu_1 - \mu_2$) when both population standard deviations (σ_1 and σ_2) are unknown. The computed confidence interval depends on the user-specified confidence level.

In the example:

SAMP1={12.207 16.869 25.05 22.429 8.456 10.589}
SAMP2={11.074 9.686 12.064 9.351 8.182 6.642}

Input:

Data

```
2-SampTInt
 Inpt:Data Stats
 List1:SAMP1
 List2:SAMP2
 Freq1:1
 Freq2:1
 C-Level:.95
↓Pooled:No Yes
```

```
 Calculate
```

Stats

```
2-SampTInt
 Inpt:Data Stats
 x̄1:15.9333
 Sx1:6.7014
 n1:6
 x̄2:9.4998
 Sx2:1.9501
↓n2:6
```

```
 C-Level:.95
 Pooled:No Yes
 Calculate
```

Calculated results:

```
2-SampTInt
 (-.5848,13.452)
 df=5.8408
 x̄1=15.9333
 x̄2=9.4998
 Sx1=6.7014
↓Sx2=1.9501
```

```
 n1=6.0000
 n2=6.0000
```

```
2-SampTInt
 (-.5849,13.452)
 df=5.8408
 x̄1=15.9333
 x̄2=9.4998
 Sx1=6.7014
↓Sx2=1.9501
```

```
 n1=6.0000
 n2=6.0000
```

1-PropZInt

1-PropZInt (one-proportion z confidence interval; item **A**) computes a confidence interval for an unknown proportion of successes. It takes as input the count of successes in the sample x and the count of observations in the sample n. The computed confidence interval depends on the user-specified confidence level.

Input:

```
1-PropZInt
 x:2048
 n:4040
 C-Level:.99
 Calculate
```

Calculated results:

```
1-PropZInt
 (.4867,.5272)
 p̂=.5069
 n=4040.0000
```

2-PropZInt

2-PropZInt (two-proportion z confidence interval; item **B**) computes a confidence interval for the difference between the proportion of successes in two populations (p_1-p_2). It takes as input the count of successes in each sample (x_1 and x_2) and the count of observations in each sample (n_1 and n_2). The computed confidence interval depends on the user-specified confidence level.

Input:

```
2-PropZInt
 x1:49
 n1:61
 x2:38
 n2:62
 C-Level:.95
 Calculate
```

Calculated results:

```
2-PropZInt
 (.0334,.3474)
 p̂1=.8033
 p̂2=.6129
 n1=61.0000
 n2=62.0000
```


χ^2-Test

χ^2-Test (chi-square test; item **C**) computes a chi-square test for association on the two-way table of counts in the specified *Observed* matrix. The null hypothesis H_0 for a two-way table is: no association exists between row variables and column variables. The alternative hypothesis is: the variables are related.

Before computing a χ^2-Test, enter the observed counts in a matrix. Enter that matrix variable name at the **Observed:** prompt in the χ^2-Test editor; default=**[A]**. At the **Expected:** prompt, enter the matrix variable name to which you want the computed expected counts to be stored; default=**[B]**.

Matrix editor:

```
MATRIX[A] 3 ×2
[ 5.0000  19.000 ]
[ 8.0000  16.000 ]
[ 11.000  13.000 ]
```

Note: Press [2nd] [MATRX] [▸] [▸] 1 to select 1:[A] from the MATRX EDIT menu.

Input:

```
χ²-Test
 Observed:[A]
 Expected:[B]
 Calculate Draw
```

Note: Press [2nd] [MATRX] [B] [ENTER] to display matrix **[B]**.

Calculated results:

```
χ²-Test
 χ²=3.3750
 p=.1850
 df=2.0000
```

```
[B]
[[8.0000 16.000...
 [8.0000 16.000...
 [8.0000 16.000...
```

Drawn results: