

TI-89, TI-92, Voyage 200 List Editor Basics

What follows is a brief description of how to enter, retrieve, and manipulate data in the *List Editor* of the TI-89, TI-92, and Voyage 200. (The instructions given within this document pertain specifically to the TI-89. It is possible that minor adjustments might be needed for the other calculators.) It is assumed that you will be able to augment this introduction to extend to the other statistical capabilities of these calculators.

Note: You need to be in the *Statistics with List Editor* program of the calculator. For the TI-89, this is

APPS - ENTER (Flash Applications) - ENTER (Stats/List Editor) - ENTER (Main folder)

Creating a New List

Use the arrow keys (◀, ▲, ▶, ▼) to place the highlighted cursor on the list name to the left of which you wish to insert a new column, or use the arrow keys to advance the cursor to an empty, unnamed (-----) list. While the box containing ----- is highlighted, the entry line (at the bottom of the screen) will contain *Name=*. Enter a list name (up to 8 characters). (For list names of 1 - 6 characters, the entire list name will be displayed. For list names of 7 or 8 characters, only the first 5 characters will be displayed. When *Name=* is listed on the entry line, the alphabetical keys are activated. To include a numeric character in the list name, press the **alpha** key. To return to letter insertion, press 2nd **a-lock**)

Entering Data into an Empty Named List

Use the arrow keys (◀, ▲, ▶, ▼) to place the highlighted cursor in the cell below the list name. Type a data value and then press **ENTER**.

Adding a Data Value to an Existing List

Use the arrow keys (◀, ▲, ▶, ▼) to move the highlighted cursor to the location in the list above which you wish to insert a data value. Press 2nd **INS**. A data value of 0 (highlighted) is inserted at that position. Type in the new data value.

Editing a Data Value

Use the arrow keys (◀, ▲, ▶, ▼) to move the highlighted cursor to the location of the data value you wish to change. While this value is highlighted, type in the new data value. Press **ENTER**.

Deleting a List Entry

Use the arrow keys (◀, ▲, ▶, ▼) to move the highlighted cursor to the location of the data value you wish to delete. While this value is highlighted, either press the ← key or the ◆ DEL key.

Deleting an Entire List

Use the arrow keys (◀, ▲, ▶, ▼) to move the highlighted cursor to the list name of the list you wish to delete. Press ◆ DEL.

Using Formulas with Lists

Data values in a list can be calculated using formulas. Depending upon how the formula is defined, subsequently edited values will either be updated by the formula or will not change once entered.

- **Formulas Attached to a List** - Each element of the target list is calculated from the source list via the attached formula, and subsequently edited values in the source list are also transformed.

Use the arrow keys (◀, ▲, ▶, ▼) to move the highlighted cursor to the list name of the empty column into which you wish to place the calculated data (i.e., the target list). Press **F3 (List) - 4 (Attach List Formula)**. Enter the appropriate formula (such as $list1 + 20$ or $4*list1$) in first line of the dialog box. Press ▼. If necessary, type in the name of the source list referenced in the formula line (such as $list1$) in the second line of the dialog box. Press **ENTER**.

- **Formulas Not Attached to a List** - This calculates a list of numbers without permanently attaching a formula. This implies that if you edit a value in the source list after performing the formula the corresponding value in the target list will not be affected.

Use the arrow keys (◀, ▲, ▶, ▼) to move the highlighted cursor to the list name of the empty column into which you wish to place the calculated data (i.e., the target list). Press **ENTER**. (The target list name is highlighted on the entry line.) Type the formula (including the source list reference) and press **ENTER**. The calculated values are placed into the target column.

TI-89, T-92, Voyage 200 Statistical Instructions

This list is meant to provide a brief summary of the keystrokes necessary to accomplish the indicated statistical result(s). It is necessarily incomplete and is not meant to replace reading the *Statistics with List Editor* manual. Familiarity with these operations should facilitate being able to subsequently perform similar calculations not discussed here. (Keystrokes are indicated below in **bold** UPPERCASE letters. Parenthetical comments not in bold are NOT keystrokes. Other comments concerning the operation follow the colon after the keystroke list.)

Note: You need to be in the *Statistics with List Editor* program of these calculators. To access this program from the **HOME** screen, perform the following keystrokes:

APPS - **ENTER** (Flash Applications) - **ENTER** (Stats/List Editor) - **ENTER** (Main folder)

Normal Distribution Calculations	
Statistical Result	Keystrokes/Comments
Pr ($a < z < b$)	F5 - 4 (Normal Cdf): Enter a as the <i>Lower Value</i> . Enter b as the <i>Upper Value</i> . For the standard normal distribution be sure to enter 0 for μ and 1 for σ .
Pr ($a < X < b$), $X \sim n(\mu, \sigma)$	F5 - 4 (Normal Cdf): Enter a as the <i>Lower Value</i> . Enter b as the <i>Upper Value</i> . Enter the appropriate population mean μ and the appropriate population standard deviation σ .
Pr ($z < b$) or Pr ($X < b$) where $X \sim n(\mu, \sigma)$	F5 - 4 (Normal Cdf): Either leave <i>Lower Value</i> box blank (use CLEAR) or enter $-\infty$ there. Enter b as the <i>Upper Value</i> . Enter the appropriate μ (0 if z) and σ (1 if z).
Pr ($a < z$) or Pr ($a < X$) where $X \sim n(\mu, \sigma)$	F5 - 4 (Normal Cdf): Enter a as the <i>Lower Value</i> . Either leave <i>Upper Value</i> box blank (use CLEAR) or enter ∞ there. Enter the appropriate μ (0 if z) and σ (1 if z).
Critical value(s) (standardized values)	F5 - 2 (Inverse) - 1 (Inverse Normal): Be sure to enter 0 for μ and 1 for σ . Enter the correct percentile location(s) of the critical value(s) (and not necessarily the level of significance value). Adjust for 2-sided test.
Critical value(s) (non-standardized values)	F5 - 2 (Inverse) - 1 (Inverse Normal): Enter the population μ and σ . Enter the correct percentile location(s) of the critical value(s) (and not necessarily the level of significance value). Adjust for 2-sided test.
p -value of the form Pr ($z < \text{negative number}$)	F5 - 4 (Normal Cdf): Either leave <i>Lower Value</i> box blank (use CLEAR) or enter $-\infty$ there. Enter the negative number given as the <i>Upper Limit</i> . (Can also be obtained as a result of performing a hypothesis test.)
p -value of the form Pr ($z > \text{positive number}$)	F5 - 4 (Normal Cdf): Enter the positive number given as the <i>Lower Limit</i> . Either leave <i>Upper Value</i> box blank (use CLEAR) or enter ∞ there. (Can also be obtained as a result of performing a hypothesis test.)

Student-t Distribution Calculations	
Statistical Result	Keystrokes/Comments
$\Pr(a < t < b)$	F5 - 6 (t Cdf): Enter a as the <i>Lower Limit</i> . Enter b as the <i>Upper Limit</i> .
$\Pr(t < b)$	F5 - 6 (t Cdf): Either leave <i>Lower Value</i> box blank (use CLEAR) or enter $-\infty$ there. Enter b as the <i>Upper Limit</i> .
$\Pr(a < t)$	F5 - 6 (t Cdf): Enter a as the <i>Lower Limit</i> . Either leave <i>Upper Value</i> box blank (use CLEAR) or enter ∞ there.
Critical value(s)	F5 - 2 (Inverse) - 2 (Inverse \uparrow): Enter the correct percentile location of the critical value (and not necessarily the level of significance value). Adjust for 2-sided test.
p -value of the form $\Pr(t < \text{negative number})$	F5 - 6 (t Cdf): Either leave <i>Lower Value</i> box blank (use CLEAR) or enter $-\infty$ there. Enter the negative number given as the <i>Upper Limit</i> . (Can also be obtained as a result of performing a hypothesis test.)
p -value of the form $\Pr(t > \text{positive number})$	F5 - 6 (t Cdf): Enter the positive number given as the <i>Lower Limit</i> . Either leave <i>Upper Value</i> box blank (use CLEAR) or enter ∞ there. (Can also be obtained as a result of performing a hypothesis test.)

One-Mean Inferences	
Statistical Result	Keystrokes/Comments
Confidence interval (population variance known)	2 nd -F2 - 1 (Z Interval) - Stats (if entering summarized values) or Data (if data are obtained from the <i>Editor</i>): Enter values required. (If using a list from the <i>Editor</i> , you must type in the name of the appropriate list(s).)
Confidence interval (population variance unknown)	2 nd -F2 - 2 (T Interval) - Stats (if entering summarized values) or Data (if data are obtained from the <i>Editor</i>): Enter values required. (If using a list from the <i>Editor</i> , you must type in the name of the appropriate list(s).)
Hypothesis test (population variance known)	2 nd -F1 - 1 (Z-Test) - Stats (if entering summarized values) or Data (if data are obtained from the <i>Editor</i>): Enter values required. Select appropriate alternative hypothesis. (If using Data , the value of <i>Freq</i> in the dialog box is usually the default 1)
Hypothesis test (population variance unknown)	2 nd -F1 - 2 (T-Test) - Stats (if entering summarized values) or Data (if data are obtained from the <i>Editor</i>): Enter values required. Select appropriate alternative hypothesis. (If using Data , the value of <i>Freq</i> in the dialog box is usually the default 1)

One-Proportion Inferences	
Statistical Result	Keystrokes/Comments
Confidence interval	2 nd -F2 - 5 (1 Proportion Z Interval) - Stats (if entering summarized values) or Data (if data are obtained from the <i>Editor</i>): Enter values required. (If using a list from the <i>Editor</i> , you must type in the name of the appropriate list(s).) Enter the hypothesized proportion (p_0), the number of successes (this is either the numerator of the numerator of the relative frequency, or equivalently, the product np')
Hypothesis test	2 nd -F1 - 5 (1 Proportion Z Test) - Stats (if entering summarized values) or Data (if data are obtained from the <i>Editor</i>): Enter values required. Select appropriate alternative hypothesis. (If using Data , the value of <i>Freq</i> in the dialog box is usually the default 1)

Chi-Square Distribution Calculations	
Statistical Result	Keystrokes/Comments
$\Pr (a < \chi^2 < b)$	F5 - 8 (Chi-square Cdf): Enter a as the <i>Lower Value</i> and b as the <i>Upper Value</i> . Degrees of freedom must also be entered.
$\Pr (\chi^2 < b)$	F5 - 8 (Chi-square Cdf): Either leave <i>Lower Value</i> box blank (use CLEAR) or enter 0 there. Enter b as the <i>Upper Limit</i> . (This probability is equivalent to $\Pr (0 < \chi^2 < b)$)
$\Pr (a < \chi^2)$	F5 - 8 (Chi-square Cdf): Enter a as the <i>Lower Limit</i> . Either leave <i>Upper Value</i> box blank (use CLEAR) or enter ∞ there.
Critical value(s)	F5 - 2 (Inverse) - 3 (Inverse Chi-square): Enter the correct percentile location of the critical value (and not necessarily the level of significance value). Adjust for 2-sided test.
p -value of the form $\Pr (\chi^2 < k)$	F5 - 8 (Chi-square Cdf): Either leave <i>Lower Value</i> box blank (use CLEAR) or enter 0 there. Enter k as the <i>Upper Value</i> . Enter the appropriate number of degrees of freedom.
p -value of the form $\Pr (\chi^2 > k)$	F5 - 8 (Chi-square Cdf): Enter k as the <i>Lower Value</i> . Either leave <i>Upper Value</i> box blank (use CLEAR) or enter ∞ there Enter the appropriate number of degrees of freedom.

One-Variance Inferences	
Statistical Result	Keystrokes/Comments
Hypothesis Test	The TI-89 does not perform these inferences
Confidence Interval	

Two-Variance Hypothesis Test	
Statistical Result	Keystrokes/Comments
Hypothesis test	2nd-F1 - 9 (2-Samp F-Test) - Enter values required for <u>each</u> sample. Select appropriate alternative hypothesis.
Confidence Interval	The TI-89 does not perform this inference

Two-Mean Hypothesis Tests	
Statistical Result	Keystrokes/Comments
Hypothesis Test (assuming <u>equal</u> population variances)	2 nd -F1 - 4 (2-Samp T-Test) - Enter values required for <u>each</u> sample. Select appropriate alternative hypothesis. Select Pooled: Yes . (Choose this because a pooled estimate of the common variance needs to be determined when the variances are assumed equal.)
Hypothesis Test (assuming <u>unequal</u> population variances)	2 nd -F1 - 4 (2-Samp T-Test) - Enter values required for <u>each</u> sample. Select appropriate alternative hypothesis. Select Pooled: No . (Choose this because a pooled estimate of the common variance does not need to be determined when the variances are assumed unequal.)
Hypothesis Test (specified nonzero difference in means)	Begin with the correct test from above. Adjust one of the sample means by the hypothesized nonzero difference. That is, depending on the alternative hypothesis, either add that nonzero difference to one of the sample means or subtract that nonzero difference from one of the sample means.
Confidence Interval (assuming <u>equal</u> population variances)	2 nd -F2 - 4 (2-Samp T Inteval) - Enter values required for <u>each</u> sample. Enter Clevel , the level of confidence. Select Pooled: Yes .
Confidence Interval (assuming <u>unequal</u> population variances)	2 nd -F2 - 4 (2-Samp T Inteval) - Enter values required for <u>each</u> sample. Enter Clevel , the level of confidence. Select Pooled: No .

Two-Proportion Hypothesis Tests	
Statistical Result	Keystrokes/Comments
Hypothesis test	2 nd -F1 - 6 (2 Proportion Z Test) - Enter values required for <u>each</u> sample. Select appropriate alternative hypothesis.
Confidence Inteval	2 nd -F2 - 6 (2-Proportion Z Inteval) - Enter values required for <u>each</u> sample. Enter Clevel , the level of confidence.

Analysis of Variance (ANOVA)	
Statistical Result	Keystrokes/Comments
Hypothesis Test (ANOVA)	2 nd -F1 - C (ANOVA) - Stats (if entering summarized values) or Data (if data are obtained from the <i>Editor</i>). Enter the number of populations being compared (Number of <i>Groups</i>). Press ENTER . If using a list from the <i>Editor</i> , you must type in the name of the appropriate list(s). If using Stats , enter the sample size, sample mean, and sample standard deviation, separated by commas, on each line of input.