Statistics on the TI-85

These functions are already “built-in” to the TI-85, except for the “extra programs”.

Extra programs are available in the TI-85 APPENDIX of this book.

TI-85 Contents

<table>
<thead>
<tr>
<th>Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusting the Contrast of the Calculator</td>
<td>37</td>
</tr>
<tr>
<td>Entering data into the STAT editor</td>
<td>37</td>
</tr>
<tr>
<td>Finding the mean, median, Q₁, Q₃ &amp; standard deviation for ........</td>
<td></td>
</tr>
<tr>
<td>1-variable raw data { (xStat = data) , (yStat =1) }</td>
<td>37</td>
</tr>
<tr>
<td>1-variable grouped data { (xStat = data) , (yStat ≠ 1) }</td>
<td>38</td>
</tr>
<tr>
<td>2-variable raw data { (xStat, yStat) = data pairs }</td>
<td>38</td>
</tr>
<tr>
<td>Drawing a histogram</td>
<td>39</td>
</tr>
<tr>
<td>Adjustments to a histogram ( in [GRAPH RANGE] )</td>
<td>39</td>
</tr>
<tr>
<td>Drawing an xyLine (or a non-connected scatterplot)</td>
<td>40</td>
</tr>
<tr>
<td>Finding a Regression Equation or (r)</td>
<td>40</td>
</tr>
<tr>
<td>Graphing a Regression Equation by hand</td>
<td>41</td>
</tr>
<tr>
<td>Graphing a Regression Equation automatically</td>
<td>41</td>
</tr>
<tr>
<td>Operations on LISTS</td>
<td>42</td>
</tr>
<tr>
<td>Random numbers</td>
<td>42</td>
</tr>
<tr>
<td>Permutations ( nPr )</td>
<td>42</td>
</tr>
<tr>
<td>Combinations ( nCr )</td>
<td>42</td>
</tr>
<tr>
<td>How to run an “extra program”</td>
<td>43</td>
</tr>
<tr>
<td>Extra program: AreaChi²</td>
<td>43</td>
</tr>
<tr>
<td>Extra program: AreaT</td>
<td>43</td>
</tr>
<tr>
<td>Extra program: BOXPLOT</td>
<td>43</td>
</tr>
<tr>
<td>Extra program: BELL</td>
<td>44</td>
</tr>
<tr>
<td>Extra program: BINOM</td>
<td>44</td>
</tr>
<tr>
<td>Extra program: CIzt</td>
<td>44</td>
</tr>
<tr>
<td>Extra program: DEFAULTS</td>
<td>45</td>
</tr>
<tr>
<td>Extra program: FRNDLYWN</td>
<td>45</td>
</tr>
<tr>
<td>Extra program: POLYDIV</td>
<td>45</td>
</tr>
<tr>
<td>Extra program: POLYMULT</td>
<td>45</td>
</tr>
<tr>
<td>TI-85 APPENDIX</td>
<td>46-50</td>
</tr>
</tbody>
</table>
To make the screen darker & easier to read, Adjust the Contrast:
1) Quickly alternate between \text{2nd} \text{UpArrow} \text{2nd} \text{UpArrow} ...
2) If the screen gets too dark, then use \text{2nd} \text{DownArrow} ...
3) If the number flashing in the top-right corner is “9” then the battery is almost out. Change all 4 batteries at once.

Entering data into the \text{STAT} editor:
1) Press the \text{[STAT]} key.
2) Choose F2 (EDIT)
3) For this class, we will use “xStat” & “yStat” so press \text{ENTER} \text{ENTER}
4) To clear out the old data, choose F5 (CLEARxy)
5) Enter each datum one-at-a-time, alternating between the x’s & y’s.

Note: An error will occur if the number of x-values is not the same as the number of y-values. It is OK to have a “blank x” & “y=1” at the end of the list. But do not use “x=0” unless zero is a value in the data.

Finding the mean & standard deviations for 1- variable “raw” data \{ (xStat = data) & (yStat = 1) \}:
To enter the data, press \text{ENTER} \text{ENTER} in order to skip over the y’s. Immediately after the data have been entered into xStat (assuming you already pressed \text{STAT} earlier), then
1) Choose \text{2nd} F1 (CALC)
2) For this class, we will use “xStat” & “yStat” so press \text{ENTER} \text{ENTER}
3) Choose F1 (1-VAR) for “one variable statistics”.
4) Press \text{EXIT} \text{EXIT} to return to an active home screen.

For example, use the list \{ 8, 7, 5, 2 \} to get:

\begin{align*}
\text{x} &= \text{xStat} \\
\text{y} &= \text{yStat} \\
\text{1st}: x &= 8 \\
\text{y} &= 1 \\
\text{2nd}: x &= 7 \\
\text{y} &= 1 \\
\text{3rd}: x &= 5 \\
\text{y} &= 1 \\
\text{4th}: x &= 2 \\
\text{y} &= 1 \\
\text{CALC} & \quad \text{EDIT} & \quad \text{DRAW} & \quad \text{FCST} \\
\text{1-STAT} & \quad \text{LIST} & \quad \text{SORTA} & \quad \text{SORTBY} & \quad \text{CLRX} \\
\text{CALC} & \quad \text{EDIT} & \quad \text{DRAW} & \quad \text{FCST} \\
\text{1-STAT} & \quad \text{LN} & \quad \text{LINR} & \quad \text{EXPN} & \quad \text{POWR} \\
\end{align*}

Note: the calculator uses the ‘y’s for frequency, as in: “5” occurs 1 time & “2” occurs 1 time.
Finding the mean & standard deviations for 1-variable “grouped” data
\{ (xStat = data) & (yStat ≠ 1) \}:
To enter the data, it’s OK for the y’s to be non-1 for the “frequencies”.
Immediately after the data have been entered into xStat and yStat
(assuming you already pressed \[ \text{STAT} \] earlier), then
1) Choose \[ \text{2nd} \text{ F1} \text{ (CALC)} \]
2) For this class, we will use “xStat” & “yStat” so press \[ \text{ENTER ENTER} \]
3) Choose \[ \text{F1 (1-VAR)} \] for “one variable statistics”.

Note: the sample size “n” is now the sum of the products of “xStat” & “yStat”. “n” is not the same as length of the “xStat” list.

4) Press \[ \text{EXIT EXIT} \] to return to an active home screen.

Finding the means & standard deviations for 2-variable “raw” data
\{ (xStat, yStat) = data pairs \}:
On a clear line of the home screen,
1) Press \[ \text{2nd} \text{ (LIST)} \]
2) \[ \text{F1 (right curly bracket)} \]
3) Press \[ \ldots \] as many times as the number of pairs “n”
4) \[ \text{F2 (left curly bracket)} \]
5) Press \[ \text{STO→} \]
6) Press \[ \text{LN (F)} \]
7) Press \[ \text{ENTER} \]

8) Press \[ \text{STAT} \]
9) \[ \text{F1 (CALC)} \]
10) Let “xlist Name”="xStat” & “ylist Name”="F"
11) \[ \text{F1 (1-Var)} \] for the \[ \bar{x} \] & \[ s \] of the x’s
12) Press \[ \text{STAT} \]
13) \[ \text{F1 (CALC)} \]
14) Let “xlist Name”="yStat” & “ylist Name”="F"
15) \[ \text{F1 (1-Var)} \] for the \[ \bar{y} \] & \[ s \] of the y’s \text{ (Note: } x=y \text{ here).}
Drawing a histogram:
After the data have been entered into xStat, then
(assuming you already pressed [STAT] earlier)
1) Choose 2nd F3 (DRAW)
2) If necessary, choose F5 (Clear Draw)
3) Choose F1 (HIST)

Note: each “y” stands for a frequency. If “raw” data, then let each y=1. If “grouped” data, then let each “y” be a frequency.

Note: If you make any changes to the [RANGE] or [Y|X|E] screens, then any “Drawing” (such as a histogram) must be re-Drawn again.

Adjustments to a histogram (in [GRAPH] [RANGE]):
1) Either de-Select or CLEAR any “y(x)=” functions under [GRAPH]
2) XMin is the starting point for the first class. Ex. let it be 0.
3) XMax should be bigger than the largest datum.
   For example, let XMax = 100 if the highest # in the data is 98.
4) XScl is the width of the classes (rectangles).
   For example, if XScl = 5, then classes will be 0-4, 5-9, 10-14, ...
   Or if XScl = 10, then classes will be 0-9, 10-19, 20-29, ...
5) YMin should start at -4. Adjust as needed.
6) YMax should start at 10. Adjust as needed.
7) YScl does not affect the histogram, but YScl = 1 is recommended.
8) Draw the histogram again.

For example, enter these data into xStat: {8, 7, 2, 11, 9, 16, 12} (n=7)
Drawing an xyLine (or a non-connected scatterplot):
After the data have been entered into xStat & yStat, then
(assuming you already pressed STAT earlier)
1) Choose 2nd F3 (DRAW)
2) If necessary, choose F5 (Clear Draw)
3) Choose F3 (connected xyLine) or F2 (non-connected plot)
4) Adjust the GRAPH RANGE as necessary:
   (XMax should be bigger than the largest x-value),
   (YMin should be smaller than the smallest y-value) & so on.
5) Press EXIT EXIT to return to an active home screen.

Note: the points plotted are very small.

Finding a Regression Equation:
or
Finding the correlation coefficient (r):
Immediately after the data have been entered into xStat & yStat, then
(assuming you already pressed [STAT] earlier), then
1) Choose 2nd F1 (CALC)
2) For this class, we will use “xStat” & “yStat” so press ENTER ENTER
3) Choose one of these:
   F2 (Linear Regression) \( y = a + b \cdot x \)
   F3 (Natural Logarithmic Reg.) \( y = a + b \cdot \ln(x) \) for \( x > 0 \)
   F4 (Exponential Regression) \( y = a \cdot b^x \) for \( y > 0 \)
   F5 (Power Regression) \( y = a \cdot x^b \) for \( x > 0 \) & \( y > 0 \)
   (MORE)
   F1 (2nd-degree Polynomial Reg.) \( y = a_2 x^2 + a_1 x + a_0 \)
   F2 (3rd-degree Polynomial Reg.) \( y = a_3 x^3 + a_2 x^2 + a_1 x + a_0 \)
   F3 (4th-degree Polynomial Reg.) \( y = a_4 x^4 + a_3 x^3 + a_2 x^2 + a_1 x + a_0 \)
   Note: \( a_0, a_1, a_2, a_3, a_4 \) are in the “PRegC” list.
4) Press EXIT EXIT to return to an active home screen.
Graphing a Regression Equation by hand:
After the data have been entered into xStat & yStat and after LinR has been calculated, then
1) Press \( \text{GRAPH} \ \{y(x)=\} \) and choose a function (for example, \( y_1 \)).
2) If necessary, then de-Select or \( \text{CLEAR} \) out any old functions.
3) Enter the numbers and symbols and x-variable in the function.
4) Go to \( \text{GRAPH RANGE} \) and adjust as necessary.
5) Optionally \( \text{TRACE} \) on \( y_1 \) moving left & right.

For example,

\[
\begin{array}{c}
\text{LinR} \\
\text{y(x)=} \\
\text{TRACE}
\end{array}
\]

Graphing a Regression Equation automatically:
After the data have been entered into xStat & yStat and immediately after calculating a regression equation, then
1) Press \( \text{GRAPH} \ \{y(x)=\} \) and choose a function (for example, \( y_1 \)).
2) If necessary, then de-Select or \( \text{CLEAR} \) out any old functions.
3) Press \( \text{STAT VARS} \)
4) Press MORE \( \rightarrow \) MORE \( \rightarrow \) F2 (RegEq)
5) Go to \( \text{GRAPH RANGE} \) and adjust as necessary.
6) Optionally \( \text{TRACE} \) on \( y_1 \) moving left & right.
Operations on LISTs:
For example, 3*xStat ENTER on the “Home Screen” will create a new list with each value of xStat tripled.
There are 2 ways to type “xStat”:
either 1) One-letter-at-a-time: 2nd ALPHA + (x) ALPHA 6 (S)
   2nd ALPHA ALPHA — (t) LOG (a) — (t)
   or 2) From a menu: 2nd — (LIST) F3 (NAMES)
   & then look for “xStat” (use the MORE key if necessary)

Random number between 0 & 1:
1) Start on a clear line of the “home screen”.
2) Press 2nd × (MATH)
3) Choose F2 for the PROB menu.
4) Choose F4 (rand)
5) Press ENTER

Random number between 0 & 7 (or for some number other than 7):
do the same as above, except multiply 7*rand before pressing ENTER
(or use some number other than 7)

Permutations (nPr or Pn,r):
1) On a clear line of the “home screen”, press the first number (n)
2) Press 2nd × (MATH)
3) Choose F2 for the PROB menu.
4) Choose F2 (nPr)
5) Press the 2nd. number (r)
6) Press ENTER

Combinations (nCr or Cn,r):
do the same as with Permutations (nPr), except choose F3 (nCr)
How to run an “extra program”:
1) Start on a clear line of the “home screen”.
2) Press the PRGM key.
3) Press F1 (NAMES)
4) Choose which program you want (use MORE if necessary).
5) Press ENTER

** Note: if at anytime you see a screen like this **

** Note: if at anytime you see a screen like this **

** then you want to get back to the “home screen” right away before your program is destroyed. The safest way to get out of the “program editor” and on to the “home screen” is to press 2nd EXIT **

Extra program: AreaT
“DF” stands for “Degrees of Freedom”, which is defined to be “n−1” for this class. Input both the lower & upper bound “t axis numbers”. After a few seconds, the probability (area) is output.

Extra program: AreaChi^2
“DF” stands for “Degrees of Freedom”, which is defined to be “n−1” for this class. Input both the lower & upper bound “c^2 axis numbers”. After a few seconds, the probability (area) is output.

Note about Upper Bounds & Lower Bounds:
If only given one bound, then you need to create another (arbitrary) bound. Do this twice in order to verify that your bound is “big” enough.

Extra program: Boxplot
First enter the data into xStat. Be sure that all of the frequencies are “1” (let all of the ‘y’s = 1). Then run the program to get the 5 numbers used in a box plot and also a graph of it. After it is “done”, then you may optionally change the “Range” for a better graph.
Extra program: Bell
When you see the moving dots in the upper-right corner, then the calculator is waiting for you to press a menu choice.
There are 5 choices here:

Choice #1 will output an area (probability) if you input the mean, standard deviation, lower (x) bound and upper (x) bound.
Choice #2 will output an area (probability) if you input the lower (z) boundary and upper (z) boundary without a graph.
Choice #3 is just like #2, except it also includes a graph.
Choice #4 will output a z-axis boundary number if you input a tail area.
Choice #5 quits the program and returns to the home screen.

Extra program: Binom
For example, choose F3 (sum). Let p = 0.7 & n = 9 to find
\[ P(3 < x < 10) = P(\text{more than 3 successes out of 9 trials}) \]

\[
\begin{array}{c}
P=0.7 \\
N=9 \\
\text{Lower R} = 4 \\
\text{Upper R} = 9 \\
\text{THE SUM IS} \\
\text{[.074 .172 .267 .267... (the list continues.)]}
\end{array}
\]

In this example, \[ P(\text{exactly 4 successes out of 9 trials}) \] is .074
& \[ P(\text{exactly 5 successes out of 9 trials}) \] is .172
& \[ P(\text{exactly 9 successes out of 9 trials}) \] is .040
which adds up to the final answer: \[ P(3 < x < 10) = .9747 \]

Extra program: Clzt
This will calculate Confidence Intervals based on \( z \) and \( t \). The appropriate formula is automatically chosen, depending on whether there are 1 or 2 samples & whether there are means or proportions.
Extra program: DEFAULTS
* Every calculator owner should put this program on their calculator! *
This is used as a “sub-program” at the beginning of some “regular”
programs, such as prgmBELL. So if prgmDEFAULTS is missing
from your calculator, then prgmBELL (for example) will not work.
These are some of the modes that it sets:

Extra program: FRNDLYWN
When using the TRACE feature on a function, this program
makes the numbers nice and FRIENDLY in the WINDOW. For
example, let \( y = x^2 + 3 \). Then \( ZOOM \) F4 (Standard) and \( TRACE \)
and RightArrow once to get:

Extra program: PolyDiv
We will not use this in Statistics class. But if you ever need to
DIVIDE a POLYNOMIAL again in a math class, then try this.

For example, if you are given \( \frac{2n^3 + 9n^2 - 2}{2n + 1} \), then input \{2, 9, 0, -2\}
and \{2,1\} to get these 2 outputs:

In this example, the reduces completely to the answer: \( n^2 + 4n - 2 \).

Extra program: PolyMult
( Use the same instructions as with PolyDiv ).
There are 4 ways to get “extra programs” onto your TI-85. From:

• another TI-85 that already has the programs.
• a math department computer that has them on disk.
• either email or the internet to your personal computer.
• manually entering each line of the program from this Appendix.

Sending programs from a TI-85 to another TI-85:
1) Link the 2 calculators with a black cable provided with purchase.
   Note: push the cable in FAR, not just in a little bit.

   On the receiving calculator:
   2) Press 2nd [x-VAR] (LINK)
   3) F2 to RECEIVE

   On the sending calculator:
   4) Press 2nd [x-VAR] (LINK)
   5) F1 to SEND
   6) F2 for PRGMs
   7) Observe that nothing has been selected yet:

   8) DownArrow & UpArrow as necessary to each program to be sent, pressing F2 (SELECT) at each one chosen. For example:

   9) F1 to TRANSMIT
   10) Press EXIT to return to the home screen.
Sending programs from a computer to a TI-85:
1) Link the calculator to the computer with a big grey “LINK” cable, sold separately from the calculator. Call for details: 1-800-TI-CARES (It’s different than the small black calc-to-calc cable).

Note: push the cable in FAR, not just in a little bit.

On the sending computer (Macintosh):
2) Open the “TI-GRAPH LINK (85)” software.
3) Move the mouse pointer to: Send
4) Click-&-Drag the mouse pointer to: Program...
5) Choose the program files to be sent by using
6) When ready to send, then press (The computer now gives the option to either or )

On the receiving calculator:
7) Press (LINK)
8) F2 to RECEIVE

On the sending computer:
9) Press

On the receiving calculator:
10) Press to return to the home screen.

Obtaining programs from email or the internet:
1) Write the author (Mark Harbison): mhfractal@aol.com
(Please allow up to 2 weeks for a response. Thank you.)
OR point a web browser to: http://www.ti.com/calc and go to the “program archive”.
2) If necessary, use “File” “Utilities...” “UUDecode File...” to translate the file from email-friendly code into calculator code.
3) Follow the above instructions for getting programs from the computer into the calculator.
Manually entering each line of the program from this Appendix.

This should be a last-resort method only. Any of the 3 previous methods is preferable to this. Editing programs is not recommended, except for experienced programmers.

However, the “Programming” chapter of the TI-85 Owner’s Manual can get you started with this, if you are interested. Good luck.

```
AreaChi2          • Program.85
: Goto H
: BY HARBISON
: Mar. 98
:
: Lbl H
: ClLCD
: Input "DF = ", D
: Input "LOWER CHI^2 = ", L
: Input "UPPER CHI^2 = ", U
: If (L<0 or U<0): Then
: Disp "POS. CHI^2 ONLY"
: Stop
: End
:
: If L>142:142 à L
: If U>142:142 à U
:
: D/2 à K
:
: If fPart K==0: Then
: (K-1)! à G
: Else
: √π à G
: .5 à X
: While X<K-.5
: X*G à G
: X+1 à X
: End
: End
:
: fnInt(X^(K-1)*e^(-X/2), X, L, U)
: Ans/(G*2^K) à W
: round(W, 4) à W
: Outpt(6,1,"AREA IS")
: Outpt(6,10,W)
: Disp "", "", ""
```

```
DEFAULTS          • program.85
: Normal: Float
: Radian: Func
: DrawLine: Seqg
: Rect GC: Coord On
: Grid Off: Axes On
: Label Off
: Fn Off
: 4 à x Fact
: 4 à y Fact
: Cl LCD

AreaT             • program.85
: Goto H
: BY Aliaga& Harbison, Mar.98
:
: Lbl H
: ClLCD
: Input "DF = ", D
: Input "Lower T = ", L
: Input "Upper T = ", U
: If L>8:8 à L
: If L<-8:-8 à L
: If U>8:8 à U
: If U<-8:-8 à U
: 0 à M
: D/2 à A
:
: Lbl E
: If fPart A==0: Then
: (A-1)! à G
: Else
: √π à G
: .5 à X
: While X<A-.5
: X*G à G
: X+1 à X
: End
: End
:
: If 0==M: Then
: G à C:(D+1)/2 à A
: End
```
If B ≤ 6: -6 → B
If B > 6: 6 → B

If M = 1: Then
  FnOff
  FnOn 1
End

Round(W, 4) → W
Ans * G / (√(D * π)) → W
Round(W, 4) → W
Disp "AREA IS ", W, ""

FRNDLYWN • program.85
Lbl A: Disp "CENTER"
Input "X": X
Input "Y": Y
Input "X-FACTOR": γ
Input "Y-FACTOR": δ
X - 63γ → xMin: X + 63γ → xMax: 10γ → xScl
Y - 31δ → yMin: Y + 31δ → yMax: 10δ → yScl
DispG: Pause: Disp "", "RE-SCALE?"
Menu(1, "YES", A, 5, "NO", B)
Lbl B
Disp "": DispG: Stop

Bell • program.85
Goto A
by Harbison Feb. 97

Lbl A
ClLCD
Disp "Bell Area Program", ""
y1 = (e^(-.5x^2)) / √(2π)
0 → M
Menu(1, "x", G, 2, "z", N, 3, "z w/G", E, 4, "P Val", F, 5, "Quit", H
Lbl H
Stop

Lbl E
1 → M

Lbl N
ClLCD
If M = 1: Disp "z Probability ", " with Graph",
If M = 0: Disp "z Probability", " w/o Graph",
Input "Lower z Bound = ", A
Input "Upper z Bound = ", B
If A < -6: -6 → A
If A > 6: 6 → A

If B < -6: -6 → B
If B > 6: 6 → B

If M = 1: Then
  FnOff
  FnOn 1
End

Round(W, 4) → K
Ans * G / (√(D * π)) → W
Round(W, 4) → W
Disp "AREA IS ", W, ""

FRNDLYWN • program.85
Lbl A: Disp "CENTER"
Input "X": X
Input "Y": Y
Input "X-FACTOR": γ
Input "Y-FACTOR": δ
X - 63γ → xMin: X + 63γ → xMax: 10γ → xScl
Y - 31δ → yMin: Y + 31δ → yMax: 10δ → yScl
DispG: Pause: Disp "", "RE-SCALE?"
Menu(1, "YES", A, 5, "NO", B)
Lbl B
Disp "": DispG: Stop

Bell • program.85
Goto A
by Harbison Feb. 97

Lbl A
ClLCD
Disp "Bell Area Program", ""
y1 = (e^(-.5x^2)) / √(2π)
0 → M
Menu(1, "x", G, 2, "z", N, 3, "z w/G", E, 4, "P Val", F, 5, "Quit", H
Lbl H
Stop

Lbl E
1 → M

Lbl N
ClLCD
If M = 1: Disp "z Probability ", " with Graph",
If M = 0: Disp "z Probability", " w/o Graph",
Input "Lower z Bound = ", A
Input "Upper z Bound = ", B
If A < -6: -6 → A
If A > 6: 6 → A
:Disp "", "Lower Bound = ", Z,*
:Disp "Upper = Some BIG z"
:Return

Lbl G
:ClrLCD
:Disp "x Probability",""
:Input " mean µ = ", G
:Input "st. dev. = ", H
:Input "Lower x Bound = ", A
:Input "Upper x Bound = ", B
:(A-G)/H à C:(B-G)/H à D
:If C>6:6 à C:If C<-6:-6 à C
:If D>6:6 à D:If D<-6:-6 à D
:abs fnInt( (e^-0.5x^2)/√(2π) , x , C , D ) à K
:round(K,4) à W
:Outpt(8,1,"P(A<x<B)=")
:Outpt(8,11,W)

PolyDiv   • program.85
:ClrLCD
:Disp " POLYNOMIAL DIVISION"
:Disp " TO ENTER COEFFICIENTS"
:Disp "{A,B}" PRESS 2nd LIST ""
:Input "L1=" , L1:Input "L2=" , L2
:dimL L1 à S:dimL L2 à T : S + T à A
:A à dimL L3: L3 à dimL L2 à dimL L4 à dimL L5
:L4 à L1 à L5
:For(I,1,A,1)
:L5(I) à L2(I) à M: M à L3(I)
:L5-(M*L4) à L5:Fill(0,L4)
:End:End
:Disp L3\Frac , L5\Frac

PolyMult   • program.85
:ClrLCD
:Disp " POLYNOMIAL MULT."
:Disp " TO ENTER COEFFICIENTS"
:Disp "{A,B}" PRESS 2nd LIST ""
:Input "L1=" , L1:Input "L2=" , L2
:dimL L1 à dimL L2 à dimL L3 à dimL L3 à dimL L2 à T : S + T - 1 à dimL L3
:Fill(0,L3) à L3 à L4
:For(I,1,T,1):Fill(0,L3)
:For(J,1,S,1):L1(J) à L3(J+1 - 1)
:End
:L2(I) à L3 + L4 à L4
:End
:L4

Binom   • program.85
:DEFAULTS
:1 à dimL L1: dimL L2 à dimL L2 à dimL L2
:ClrLCD: FnOff
:Disp "Binomial Prob.", ""
:Lbl R3
:Stop
:Lbl T
:Prompt P
:If P<0 or P>1:Goto A
:Prompt N,R
:If fPart N ≠ 0 or fPart R ≠ 0 or N<0 or R<0:Goto B
:N à nCr R à P^R*(1-P)^(N-R) à K
:Disp "", "P(R OUT OF N)=" , K
:Stop
:Lbl A
:Disp "", " P MUST BE"
:Disp " BETWEEN 0 AND 1", ""
:Stop
:Lbl B
:Disp "", " N AND R MUST BE" 
:Disp " INTEGERS ≥0": Stop
:Lbl C
:Disp "", "R MUST BE 0 ≤ R ≤ N", ""
:Stop
:Lbl S
:Prompt P
:If P<0 or P>1:Goto A
:Prompt N
:If fPart N ≠ 0 or N<0:Goto B
:Input "Lower R = ", A

TI-85 'Calculator Instructions' © Mark Harbison
page 50
If \( A < 0 \) or \( A > N \)  
Goto C

If \( fPart \) \( A \neq 0 \)  
Goto B

Input "Upper R = ", B

If \( fPart \) \( B \neq 0 \): Goto B

If \( B < 0 \) or \( B > N \): Goto C

For(1,1,N+1)
\( 0 \rightarrow L2(1) \)
End

For(\( R, A, B \))
\( N \ nCr \ R \cdot P^R \cdot (1 - P)^{N-R} \rightarrow L2(R+1) \)
End

For(\( J, A, B \))
\( L2(J+1) \rightarrow L1(J-A+1) \)
End

sum \( L1 \rightarrow S \)
Disp "THE SUM IS ", S
round(L1,3) \rightarrow L1

Lbl C
-1 \rightarrow yMin: 5.2 \rightarrow yMax: 1 \rightarrow yScl
\int ((B+A)/2) \rightarrow G
\int (-1+iPart\ log\ B) \rightarrow P
\int G \cdot 63P \rightarrow xMin: G+63P \rightarrow xMax

If \( fPart \) \( (n/4) = 0 \): Goto A
If \( fPart \) \( (n/4) = .25 \): Goto A
\( xStat(iPart\ (n/4)+1) \rightarrow L \)
\( xStat(n-iPart\ (n/4)+1) \rightarrow U \)
Goto D
Stop

Lbl A
\( (xStat(iPart\ (n/4)) + xStat(iPart\ (n/4)+1))/2 \rightarrow L \)
\( (xStat(n-iPart\ (n/4)) + xStat(n-iPart\ (n/4)+1))/2 \rightarrow U \)

Lbl B
DEFAULTS
ClDrw
If \( dim\ L \) \( xStat == 0 \): Then
Disp "Be sure data", "are in xStat", ""
Stop
End

Fill(1,yStat)
Sort x
OneVar
\( xStat(1) \rightarrow \text{max}(xStat) \rightarrow B \)
If \( int\ (n/2) = (n/2) \): Then
\( (xStat(n/2) + xStat(n/2+1))/2 \rightarrow M \)
Goto C
End
\( xStat(int\ (n/2)+1 \rightarrow M \)

Lbl D
Outpt(3,1,"Min. = ")
Outpt(3,9,A)
Outpt(4,1,"Q1 = ")
Outpt(4,9,L)
Outpt(5,1,"Median = ")
Outpt(5,9,M)
Outpt(6,1,"Q3 = ")
Outpt(6,9,U)
Outpt(7,1,"Max. = ")
Outpt(7,9,B)
Outpt(8,1," (ENTER when ready)"
Disp "(Assuming yStat", "Frequencies Are = 1)"
Pause
Line(L,2,L,4)
Line(U,2,U,4)
Line(L,2,L,2)
Line(L,4,U,4)
Line(A,3,L,3)
Line(U,3,B,3)
Line(M,2,M,4)
Pause
Outpt(8,1,"Done")

Boxplot        • program.85
by Harbison aug, 97

Lbl A
\( (xStat(iPart\ (n/4)) + xStat(iPart\ (n/4)+1))/2 \rightarrow L \)
\( (xStat(n-iPart\ (n/4)) + xStat(n-iPart\ (n/4)+1))/2 \rightarrow U \)

Lbl B
DEFAULTS
ClDrw
If \( dim\ L \) \( xStat == 0 \): Then
Disp "Be sure data", "are in xStat", ""
Stop
End

Fill(1,yStat)
Sort x
OneVar
\( xStat(1) \rightarrow \text{max}(xStat) \rightarrow B \)
If \( int\ (n/2) = (n/2) \): Then
\( (xStat(n/2) + xStat(n/2+1))/2 \rightarrow M \)
Goto C
End
\( xStat(int\ (n/2)+1 \rightarrow M \)

Lbl C
-1 \rightarrow yMin: 5.2 \rightarrow yMax: 1 \rightarrow yScl
\int ((B+A)/2) \rightarrow G
\int (-1+iPart\ log\ B) \rightarrow P
\int G \cdot 63P \rightarrow xMin: G+63P \rightarrow xMax

If \( fPart \) \( (n/4) = 0 \): Goto A
If \( fPart \) \( (n/4) = .25 \): Goto A
\( xStat(iPart\ (n/4)+1) \rightarrow L \)
\( xStat(n-iPart\ (n/4)+1) \rightarrow U \)
Goto D
Stop

Lbl A
\( (xStat(iPart\ (n/4)) + xStat(iPart\ (n/4)+1))/2 \rightarrow L \)
\( (xStat(n-iPart\ (n/4)) + xStat(n-iPart\ (n/4)+1))/2 \rightarrow U \)

Lbl B
DEFAULTS
ClDrw
If \( dim\ L \) \( xStat == 0 \): Then
Disp "Be sure data", "are in xStat", ""
Stop
End

Fill(1,yStat)
Sort x
OneVar
\( xStat(1) \rightarrow \text{max}(xStat) \rightarrow B \)
If \( int\ (n/2) = (n/2) \): Then
\( (xStat(n/2) + xStat(n/2+1))/2 \rightarrow M \)
Goto C
End
\( xStat(int\ (n/2)+1 \rightarrow M \)

Lbl C
-1 \rightarrow yMin: 5.2 \rightarrow yMax: 1 \rightarrow yScl
\int ((B+A)/2) \rightarrow G
\int (-1+iPart\ log\ B) \rightarrow P
\int G \cdot 63P \rightarrow xMin: G+63P \rightarrow xMax

If \( fPart \) \( (n/4) = 0 \): Goto A
If \( fPart \) \( (n/4) = .25 \): Goto A
\( xStat(iPart\ (n/4)+1) \rightarrow L \)
\( xStat(n-iPart\ (n/4)+1) \rightarrow U \)
Goto D
Stop

Lbl A
\( (xStat(iPart\ (n/4)) + xStat(iPart\ (n/4)+1))/2 \rightarrow L \)
\( (xStat(n-iPart\ (n/4)) + xStat(n-iPart\ (n/4)+1))/2 \rightarrow U \)

Lbl B
DEFAULTS
ClDrw
If \( dim\ L \) \( xStat == 0 \): Then
Disp "Be sure data", "are in xStat", ""
Stop
End

Fill(1,yStat)
Sort x
OneVar
\( xStat(1) \rightarrow \text{max}(xStat) \rightarrow B \)
If \( int\ (n/2) = (n/2) \): Then
\( (xStat(n/2) + xStat(n/2+1))/2 \rightarrow M \)
Goto C
End
\( xStat(int\ (n/2)+1 \rightarrow M \)