

TI-84+ Labs For Statistics 225

Introduction to Probability Models

by

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TI-84+ Lab 1 for Statistics 225

Topics: relative frequency histograms, sample average and standard deviation

Dataset(s): "showerhead.dat", a dataset of the maximum flow rates for 34 different shower heads:

2.9 2.8 2.0 3.6 2.7 2.5 2.6 2.9 2.7 2.8 2.5 2.8 2.2 2.5 2.5 2.8 1.8 2.7 2.7 4.7 2.8 2.7
3.1 2.9 3.4 2.6 2.6 2.7 2.4 2.5 5.4 4.9 2.8 2.5

Relative frequency histograms. In this exercise, you will use the TI-84+ to draw a histogram for the "showerhead.dat" dataset.

- Type the 34 data values in list L3.
- Turn off (clear) all the STAT PLOTS and Y = plots.
- Turn on one of the STAT PLOTS for the histogram by typing:
 - 2nd STAT PLOT ENTER

Once at the "Plot1" screen, choose or type in the following options:

- On
- Type: histogram figure at far right
- Xlist: L3 (for data points)
- Freq: 1 (each data point counted once)
- To fit the histogram to the screen window of the calculator, press
 - ZOOM 9 ENTER
- Display the histogram by pressing either TRACE or GRAPH.
- By pressing TRACE, a histogram with information on it is displayed. A little box with a blinking "X" through it appears on the center top of the first vertical bar of the histogram. At the bottom of the histogram are three bits of information: "min = 1.8", "max < 2.4" and "n = 3". This tells you that three of the showerheads have flow rates in the interval greater than or equal to 1.8 and less than 2.4. By hitting the right arrow key, the little box with a blinking "X" through it moves to the center top of the second vertical bar of the histogram.
- A histogram without any information is obtained by pressing GRAPH.
- It is also possible to set up the screen window of the calculator to fit the histogram *manually* by pressing WINDOW and then choosing the following options:

- Xmin = 2.4
- Xmax = 6
- Xscl = 5 (since the class width is 5 units)
- Ymin = (-) $25 \div 4$ (let Ymin = -Ymax/4, to leave room at the bottom of the screen for the display of histogram information)
- Ymax = 25
- Yscl = 5 (convenient space between tick marks on frequency axis of histogram)
- Xres = 1 (plots at every pixel on the screen; 2 would plot at every 2nd pixel and so on—this option is *not* active when plotting histograms, though.)

Summary Statistics. In this exercise, you will use the TI-84+ to calculate summary statistics for the “showerhead” data. After typing the 34 values of “showerhead” into L_1 of your calculator, key in

- STAT CALC 1:1-Var Stats ENTER 2nd L_1 ENTER

The following summary statistics will then appear. Some of these summary statistics appear *below* the screen window; just arrow down, using the blue down arrow button, to view these summary statistics.

- mean: $\bar{x} = 2.88$
- sum: $\sum x = 98$
- sum of squares: $\sum x^2 = 301.02$
- sample standard deviation: $s_x = 0.75$
- population standard deviation: $\sigma_x = 0.739$
- sample size: $n = 34$
- minimum value: $\min X = 1.8$
- lower quartile: $Q_1 = 2.5$
- median: $\text{Med} = 2.7$
- upper quartile: $Q_3 = 2.9$
- maximum value: $\max X = 5.4$

We will be interested in many of the statistics given here.