Often, frequency distributions are reported using unequal class widths because the frequencies of some groups would otherwise be small or very large. Consider the following data, which represent the daytime household temperature the thermostat is set to when someone is home for a random sample of 758 households. Determine the class midpoint, if necessary, for each class and approximate the mean and standard deviation temperature.

⊞ Click the icon to view the frequency distribution for the amount of savings.

Class	Class Midpoint
61–64	63
65–67	66.5
68–69	69
70	70.5
71–72	72
73–76	75
77–80	79

(Round to one decimal place as needed.)

The sample mean is 70.8 °F.
(Round to one decimal place as needed.)

The sample standard deviation is 3.4 °F.
(Round to one decimal place as needed.)

Determine the class midpoint of each class by adding consecutive lower limits and dividing by 2.

$$\frac{61+65}{2} = 63$$

$$\frac{65+68}{2} = 66.5.......$$ **last us 80-1 = 79**

Make a separate column of the CLASS MIDPOINT

StatCrunch	Applets	Edit	Data	Stat	Graph	Help

Row	Temperature	Frequency	var3	var4	var5	var6	va
1	61-64	31	63				
2	65-67	64	66.5				
3	68-69	195	69				
4	70	195	70.5				
5	71-72	122	72				
6	73-76	89	75				
7	77-80	47	79				
8							

Grouped/Binned Summary Stats

Bins in:
var3

Counts in:
Frequency

Where:
--optional--   **Build**

Midpoints defined by the average of:
⦿ Limits
○ Consecutive lower limits

Statistics:
n   Mean
Mean
Variance

STATCRUNCH

STAT-SUMMARY STATS – GROUPED/BINNED

Bins in: var3
Counts in: Frequency

● **Limits (since it is the midpoint)**

Mean then Std. dev

A sample of college students was asked how much they spent monthly on pizza. Approximate the mean for the cost.

Monthly pizza cost ($)	Number of students
10.00-19.99	5
20.00-29.99	14
30.00-39.99	20
40.00-49.99	18
50.00-59.99	7

The mean for the cost is $ 36.25 . (Round to the nearest cent.)

STATS – SUMMARY STATS – GROUPED/BINNED *make sure to click consecutive lower limits!!

An exit poll was conducted in which a random sample of 20 voters revealed whom they voted for in the election. The results are listed in the table below.

Ohm	Smith	Ohm	Smith
Johnson	Johnson	Johnson	Smith
Smith	Johnson	Johnson	Ohm
Chang	Johnson	Ohm	Johnson
Chang	Johnson	Johnson	Smith

Who is the mode candidate?

- ★ Johnson
- ○ Smith
- ○ Ohm
- ○ Chang

The following data represent the annual number of days over 100° F in a city from 1905 to 2004. Approximate the mean and standard deviation of annu population.

Number of over 100° F days	0-9	10-19	20-29	30-39	40-49	50-59	60-69
Number of years	34	34	16	10	3	2	1

μ = 17.40 (Round to two decimal places as needed.)

σ = 12.97 (Round to two decimal places as needed.)

STATS – SUMMARY STATS – GROUPED/BINNED DATA – mean and unadj. St. dev

The accompanying data represent the carbon dioxide (CO_2) emissions (in thousands of metric tons) of the top 10 emitters in a recent year. Complete parts (a) through (c).

📖 Click the icon to view the data table.

STATS – SUMMARY STATS - COLUMNS

(a) Determine the mean CO_2 emissions of the top 10 countries.

The mean CO_2 emissions is 1,814,654.5 thousand metric tons.
(Type an integer or a decimal.)

(b) Explain why the total emissions of a country is likely not the best gauge of CO_2 emissions; instead, the emissions per capita (total emissions divided by population size) is the better gauge. Choose the correct answer below.

- ○ A. The emissions per capita is better because it is smaller.
- ★ B. The emissions per capita is better because it adjusts emissions for population size.
- ○ C. The emissions per capita is better because it does not adjust emissions for population size.

(c) Determine the mean and median per capita CO_2 emissions of the top 10 countries. Which measure would an environmentalist likely use to support the position that per capita CO_2 emissions are too high? Why?

The mean per capita CO_2 emissions of the top 10 countries is 2.834 thousand metric tons. (Type an integer or a decimal.)

The median per capita CO_2 emissions of the top 10 countries is 2.670 thousand metric tons. (Type an integer or a decimal.)

Which measure would an environmentalist likely use to support the position that per capita CO_2 emissions are too high? Why? Choose the correct answer below.

- ○ A. The median per capita CO_2 emissions because this value is smaller
- ★ B. The mean per capita CO_2 emissions because this value is greater
- ○ C. Neither value is more likely to be chosen because there is no difference between the measures.

The following data represent the pulse rates (beats per minute) of nine students enrolled in a statistics course. Treat the nine students as a population. Complete parts **(a)** through **(c)**.

Student	Pulse
Perpectual Bempah	81
Megan Brooks	62
Jeff Honeycutt	67
Clarice Jefferson	69
Crystal Kurtenbach	88
Janette Lantka	78
Kevin McCarthy	80
Tammy Ohm	84
Kathy Wojdya	60

STATS – SUMMARY STATS – COLUMNS
UNAD. ST.DEV

For the samples make separate column for specific people in the sample

(a) Compute the population standard deviation.

$\sigma =$ 9.5 beats/minute
(Type an integer or decimal rounded to one decimal place as needed.)

(b) Determine the sample standard deviation of the following two simple random samples of size 3.

Sample 1 {Perpectual, Tammy, Megan}
Sample 2 {Clarice, Tammy, Crystal}

The sample standard deviation, s, of sample 1, {Perpectual, Tammy, Megan}, is 11.9 beats per minute.
(Type an integer or decimal rounded to one decimal place as needed.)

The sample standard deviation, s, of sample 2, {Clarice, Tammy, Crystal}, is 10.0 beats per minute.
(Type an integer or decimal rounded to one decimal place as needed.)

(c) Determine if the standard deviation of samples 1 and 2 overestimate, underestimate, or are equal to the population standard deviation.

Compare the sample standard deviation of sample 1 to the population standard deviation. Choose the correct answer below.

○ A. The sample 1 standard deviation underestimates the population standard deviation.
★ B. The sample 1 standard deviation overestimates the population standard deviation.

Is the sample standard deviation of sample 2 an overestimate of, an underestimate of, or equal to the population standard deviation?

○ A. The sample 2 standard deviation is equal to the the population standard deviation.
○ B. The sample 2 standard deviation underestimates the population standard deviation.
★ C. The sample 2 standard deviation overestimates the population standard deviation.

For the histogram on the right determine whether the mean is greater than, less than, or approximately equal to the median. Justify your answer.
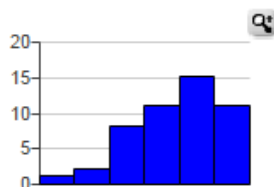
Which of the following is correct?

○ A. $\bar{x} < M$ because the histogram is symmetric.
○ B. $\bar{x} = M$ because the histogram is symmetric.
○ C. $\bar{x} = M$ because the histogram is skewed right.
○ D. $\bar{x} > M$ because the histogram is skewed right.
★ E. $\bar{x} < M$ because the histogram is skewed left.
○ F. $\bar{x} > M$ because the histogram is skewed left.

The weight of an organ in adult males has a bell-shaped distribution with a mean of 320 grams and a standard deviation of 35 grams. Use the empirical rule to determine the following.
(a) About 95% of organs will be between what weights?
(b) What percentage of organs weighs between 285 grams and 355 grams?
(c) What percentage of organs weighs less than 285 grams or more than 355 grams?
(d) What percentage of organs weighs between 250 grams and 425 grams?

(a) 250 and 390 grams (Use ascending order.) **95% is 2 std devs   320-2(35)   and 320+2(35)**

(b) 68 % (Type an integer or a decimal.) **320 – 285 = 35 means one std dev**

(c) 32 % (Type an integer or a decimal.) **320-285 = 35   355 – 320= 35   *it is on the outside -100-68**

(d) 97.35 % (Type an integer or decimal rounded to the nearest hundredth as needed.) **320-250=70 is 2 425-320=105 is 3**

FROM EMPIRICAL RULE GRAPH   13.5+34+34+13.5+2.35=97.35

Jamie has just completed her second semester in college. She earned a grade of D in her 2-hour calculus course, a grade of A in her 1-hour economics course, a grade of D in her 3-hour engineering course, and a grade of F in her 1-hour creative writing course. Assuming that A equals 4 points, B equals 3 points, C equals 2 points, D equals 1 point, and F is worth no points, determine Jamie's grade-point average for the semester.

Jamie's grade point average is 1.29.
(Round to two decimal places as needed.)

Suppose that a customer is purchasing a car. He conducts an experiment in which he puts 10 gallons of gas in the car and drives it until it runs out of gas. He conducts this experiment 15 times on each car and records the number of miles driven.

Full data set

Car 1				
226	205	216	229	229
269	266	245	298	256
241	243	280	246	270

Car 2				
224	203	235	213	251
168	206	252	168	292
287	309	302	273	267

STATCRUNCH

STAT- SUMMARY STATS-

COLUMNS

MEAN OR MEDIAN

Which car would the customer buy and why?

- A. Car 1, because it has a lower mean gas mileage.
- B. Car 1, because it has a lower sample standard deviation, hence more predictable gas mileage.
- C. Car 2, because it has a larger range of gas mileage.
- D. There is very little difference between the two cars.

STATCRUNCH

STAT- SUMMARY STATS-COLUMNS
STATISTICS – **Std. dev**
for s = SAMPLE

COMPUTE

Describe each data set, that is determine the shape, center, and spread.

Sample mean for Car 1
x = 247.9 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Sample mean for Car 2
x = 243.3 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Median for Car 1
M = 245 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Median for Car 2
M = 251 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Range for Car 1
R = 93 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Range for Car 2
R = 141 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Sample standard deviation for Car 1
s = 25.4 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Sample standard deviation for Car 2
s = 45.8 mi / 10 gal
(Type an integer or decimal rounded to one decimal place as needed.)

Which car would the customer buy and why?

Compute the range and sample standard deviation for strength of the concrete (in psi).

3960, 4100, 3300, 3000, 2970, 3820, 4100, 4010 ▣

The range is 1130 psi.

s = 487.9 psi (Round to one decimal place as needed.)

STATS – SUMMARY STATS – COLUMNS – ST.DEV

Jamie has just completed her second semester in college. She earned a grade of C in her 1-hour linear algebra course, a grade of D in her 1-hour sociology course, a grade of A in her 3-hour physics course, and a grade of A in her 5-hour speech writing course. Assuming that A equals 4 points, B equals 3 points, C equals 2 points, D equals 1 point, and F is worth no points, determine Jamie's grade-point average for the semester.

Jamie's grade point average is 3.5 .
(Round to two decimal places as needed.)

Grade value X hours and compute the total for all classes divided by total number of hours taken.

$$\frac{2(1)+1(1)+4(3)+4(5)}{10} = \mathbf{3.5}$$ **for total hours count the numbers in parenthesis**

The acidity or alkalinity of a solution is measured using pH. A pH less than 7 is acidic; a pH greater than 7 is alkaline. The accompanying data repre of bottled water and tap water. Complete parts (a) and (b).
▣ Click the icon to view the data table.

(a) Compute the mean, median, and mode pH for each type of water in table (a) only.

For tap water, the mean pH is 7.54 . (Round to the nearest thousandth as needed.)

For tap water, the median pH is 7.485 . (Round to the nearest thousandth as needed.)

Select the correct choice below and fill in any answer boxes in your choice.

☑ A. For tap water, the mode pH is 7.47 .
   (Round to the nearest thousandth as needed. Use a comma to separate answers as needed.)
○ B. There is no mode.

click on the column you need then hold the Ctrl button to highlight mean, median and mode to compute all at once

Change 7.47 to the new # they give you in your statcrunch table and calculate the new mean for that column.

The property of the median illustrates the resistance of the median

Find the population mean or sample mean as indicated.

Population: 9, 5, 12, 15, 14 🗐

Compute the population mean for this data set. Select the correct choice below and fill in the answer box to complete your choice.

○ A. $\bar{x} =$ ☐

Sample mean is $\bar{x}$

✱ B. $\mu =$ 11

Population mean is μ

The mean of the commute time to work for a resident of a certain city is 28.3 minutes. Assume that the standard deviation of the commute time is 7.6 minutes to complete parts (a) through (c).

(a) What minimum percentage of commuters in the city has a commute time within 2 standard deviations of the mean?

75 % (Type an integer or a decimal.)

$$\left(1 - \frac{1}{2^2}\right) = 75\%$$

(b) What minimum percentage of commuters in the city has a commute time within 2.5 standard deviations of the mean? What are the commute times within 2.5 standard deviations of the mean?

The minimum percentage of commuters in the city that has a commute time within 2.5 standard deviations of the mean is 84.0 %. (Round to one decimal place as needed.)

$$\left(1 - \frac{1}{2.5^2}\right) = 84\%$$

The commute times within 2.5 standard deviations of the mean are between 9.3 and 47.3.
(Type an integer or a decimal. Use ascending order.)

$$\mu - 2.5\sigma = 28.3 - 2.5(7.6) = 9.3$$
$$\mu + 2.5\sigma = 28.3 + 2.5(7.6) = 47.3$$

(c) What is the minimum percentage of commuters who have commute times between 5.5 minutes and 51.1 minutes?

88.9 % (Round to one decimal place as needed.)

Find the standard deviations are away from the mean

[Mean – one of the scores] → 28.3-5.5 = $\frac{22.8}{7.6}$ = 3 *then* $\left(1 - \frac{1}{3^2}\right) = 88.89\%$

ANOTHER WAY ---- mean + s.d. until you get 51.1

28.7 + 7.6 = 36.3 + 7.6 = 43.9 + 7.6 = 51.5

3 standard deviations: $\left(1 - \frac{1}{3^2}\right) = 88.89\%$