

Descriptive Statistics and Histograms

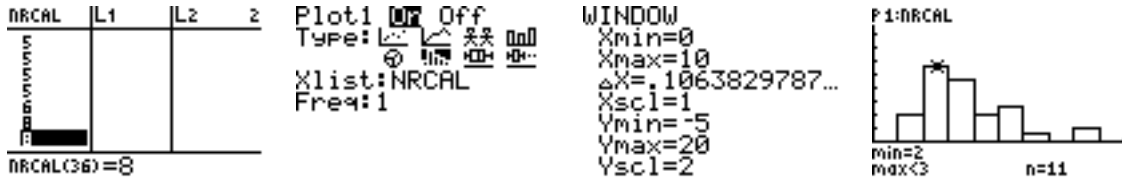
Range: The range is a statistic that helps to describe the spread of the data. The range requires numerical data to find a difference between the highest and lowest data value.

Mode: The mode indicates which data value occurs most often.

Median: The median describes a middle point of the data values (half the data values are above the median and half the data values are below the median). The median requires arranging the data values in ascending or descending order to determine the middle point of the data.

Mean: The mean describes what would be a fair share of the data values or a balance point of the data values.

How many calculators (of any kind) do you own?



Range is 7; data values range from one calculator owned to 8 calculators owned.

Mode is 2; the most frequent data value is 2 calculators owned.

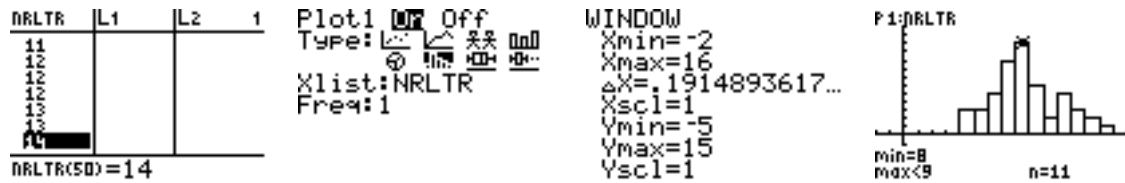
Median is 3; the middle of the data values is 3 calculators owned, or half the people surveyed own 3 or more calculators and half of the people surveyed own 3 or fewer calculators.

Mean is 3.2 (to the nearest tenth); if everyone surveyed owned the same number of calculators, it would be a little more than 3 calculators, or the balance point of the data is a little more than 3 calculators owned.

Possible conclusion: since the three measures of central tendency are relatively close in value, it is reasonable to conclude that the average number of calculators owned is about 3. The data value of 8 calculators is an outlier for this set of data and does pull the mean a little bit higher than the median and mode.

The histogram provides a visual image that shows most of the data is clumped around 2-3 and supports a claim of 2-3 calculators as a typical number of calculators owned by the people surveyed.

How many letters are in the name of each of the 50 states in the U.S.A.?



Range is 10; data values range from 4 to 14 letters in a state name.

Mode is 8; the most frequent data value is 8 letters in a state name.

Median is 8; the middle of the data values is 8 letters in a state name, or half the state names have 8 or more letters and half the state names have 8 or fewer letters.

Mean is 8.26; if all state names had the same number of letters, each name would have a little more than 8 letters, or the balance point of the data is a little more than 8 letters in a state name.

Possible conclusion: since the three measures of central tendency (mean, median, and mode) are all relatively close and cluster around 8 letters, it is reasonable to conclude that the average number of letters in a state's name is about 8 letters.

The histogram provides a visual image that shows the data in a generally symmetrical shape around 8 and supports a claim of 8 letters as the typical length of a state name in the U.S.A.

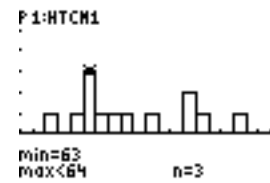
How tall are you in centimeters?

HTCM1	L1	L2	5
63.5			
66			
63			
75			
64			
72			
63.5 1/2			

L2(1) =

Plot1 Off
Type: L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L17 L18 L19 L20 L21 L22 L23 L24 L25 L26 L27 L28 L29 L30 L31 L32 L33 L34 L35 L36 L37 L38 L39 L40 L41 L42 L43 L44 L45 L46 L47 L48 L49 L50 L51 L52 L53 L54 L55 L56 L57 L58 L59 L60 L61 L62 L63 L64 L65 L66 L67 L68 L69 L70 L71 L72 L73 L74 L75 L76 L77 L78 L79 L80 L81 L82 L83 L84 L85 L86 L87 L88 L89 L90 L91 L92 L93 L94 L95 L96 L97 L98 L99 L100 L101 L102 L103 L104 L105 L106 L107 L108 L109 L110 L111 L112 L113 L114 L115 L116 L117 L118 L119 L120 L121 L122 L123 L124 L125 L126 L127 L128 L129 L130 L131 L132 L133 L134 L135 L136 L137 L138 L139 L140 L141 L142 L143 L144 L145 L146 L147 L148 L149 L150 L151 L152 L153 L154 L155 L156 L157 L158 L159 L160 L161 L162 L163 L164 L165 L166 L167 L168 L169 L170 L171 L172 L173 L174 L175 L176 L177 L178 L179 L180 L181 L182 L183 L184 L185 L186 L187 L188 L189 L190 L191 L192 L193 L194 L195 L196 L197 L198 L199 L200 L201 L202 L203 L204 L205 L206 L207 L208 L209 L210 L211 L212 L213 L214 L215 L216 L217 L218 L219 L220 L221 L222 L223 L224 L225 L226 L227 L228 L229 L230 L231 L232 L233 L234 L235 L236 L237 L238 L239 L240 L241 L242 L243 L244 L245 L246 L247 L248 L249 L250 L251 L252 L253 L254 L255 L256 L257 L258 L259 L260 L261 L262 L263 L264 L265 L266 L267 L268 L269 L270 L271 L272 L273 L274 L275 L276 L277 L278 L279 L280 L281 L282 L283 L284 L285 L286 L287 L288 L289 L290 L291 L292 L293 L294 L295 L296 L297 L298 L299 L300 L301 L302 L303 L304 L305 L306 L307 L308 L309 L310 L311 L312 L313 L314 L315 L316 L317 L318 L319 L320 L321 L322 L323 L324 L325 L326 L327 L328 L329 L330 L331 L332 L333 L334 L335 L336 L337 L338 L339 L340 L341 L342 L343 L344 L345 L346 L347 L348 L349 L350 L351 L352 L353 L354 L355 L356 L357 L358 L359 L360 L361 L362 L363 L364 L365 L366 L367 L368 L369 L370 L371 L372 L373 L374 L375 L376 L377 L378 L379 L380 L381 L382 L383 L384 L385 L386 L387 L388 L389 L390 L391 L392 L393 L394 L395 L396 L397 L398 L399 L400 L401 L402 L403 L404 L405 L406 L407 L408 L409 L410 L411 L412 L413 L414 L415 L416 L417 L418 L419 L420 L421 L422 L423 L424 L425 L426 L427 L428 L429 L430 L431 L432 L433 L434 L435 L436 L437 L438 L439 L440 L441 L442 L443 L444 L445 L446 L447 L448 L449 L450 L451 L452 L453 L454 L455 L456 L457 L458 L459 L460 L461 L462 L463 L464 L465 L466 L467 L468 L469 L470 L471 L472 L473 L474 L475 L476 L477 L478 L479 L480 L481 L482 L483 L484 L485 L486 L487 L488 L489 L490 L491 L492 L493 L494 L495 L496 L497 L498 L499 L500 L501 L502 L503 L504 L505 L506 L507 L508 L509 L510 L511 L512 L513 L514 L515 L516 L517 L518 L519 L520 L521 L522 L523 L524 L525 L526 L527 L528 L529 L530 L531 L532 L533 L534 L535 L536 L537 L538 L539 L540 L541 L542 L543 L544 L545 L546 L547 L548 L549 L550 L551 L552 L553 L554 L555 L556 L557 L558 L559 L560 L561 L562 L563 L564 L565 L566 L567 L568 L569 L570 L571 L572 L573 L574 L575 L576 L577 L578 L579 L580 L581 L582 L583 L584 L585 L586 L587 L588 L589 L590 L591 L592 L593 L594 L595 L596 L597 L598 L599 L600 L601 L602 L603 L604 L605 L606 L607 L608 L609 L610 L611 L612 L613 L614 L615 L616 L617 L618 L619 L620 L621 L622 L623 L624 L625 L626 L627 L628 L629 L630 L631 L632 L633 L634 L635 L636 L637 L638 L639 L640 L641 L642 L643 L644 L645 L646 L647 L648 L649 L650 L651 L652 L653 L654 L655 L656 L657 L658 L659 L660 L661 L662 L663 L664 L665 L666 L667 L668 L669 L670 L671 L672 L673 L674 L675 L676 L677 L678 L679 L680 L681 L682 L683 L684 L685 L686 L687 L688 L689 L690 L691 L692 L693 L694 L695 L696 L697 L698 L699 L700 L701 L702 L703 L704 L705 L706 L707 L708 L709 L710 L711 L712 L713 L714 L715 L716 L717 L718 L719 L720 L721 L722 L723 L724 L725 L726 L727 L728 L729 L730 L731 L732 L733 L734 L735 L736 L737 L738 L739 L740 L741 L742 L743 L744 L745 L746 L747 L748 L749 L750 L751 L752 L753 L754 L755 L756 L757 L758 L759 L760 L761 L762 L763 L764 L765 L766 L767 L768 L769 L770 L771 L772 L773 L774 L775 L776 L777 L778 L779 L780 L781 L782 L783 L784 L785 L786 L787 L788 L789 L790 L791 L792 L793 L794 L795 L796 L797 L798 L799 L800 L801 L802 L803 L804 L805 L806 L807 L808 L809 L810 L811 L812 L813 L814 L815 L816 L817 L818 L819 L820 L821 L822 L823 L824 L825 L826 L827 L828 L829 L830 L831 L832 L833 L834 L835 L836 L837 L838 L839 L840 L841 L842 L843 L844 L845 L846 L847 L848 L849 L850 L851 L852 L853 L854 L855 L856 L857 L858 L859 L860 L861 L862 L863 L864 L865 L866 L867 L868 L869 L870 L871 L872 L873 L874 L875 L876 L877 L878 L879 L880 L881 L882 L883 L884 L885 L886 L887 L888 L889 L890 L891 L892 L893 L894 L895 L896 L897 L898 L899 L900 L901 L902 L903 L904 L905 L906 L907 L908 L909 L910 L911 L912 L913 L914 L915 L916 L917 L918 L919 L920 L921 L922 L923 L924 L925 L926 L927 L928 L929 L930 L931 L932 L933 L934 L935 L936 L937 L938 L939 L940 L941 L942 L943 L944 L945 L946 L947 L948 L949 L950 L951 L952 L953 L954 L955 L956 L957 L958 L959 L960 L961 L962 L963 L964 L965 L966 L967 L968 L969 L970 L971 L972 L973 L974 L975 L976 L977 L978 L979 L980 L981 L982 L983 L984 L985 L986 L987 L988 L989 L990 L991 L992 L993 L994 L995 L996 L997 L998 L999 L1000

WINDOW
Xmin=58
Xmax=78
ΔX=.2127659574...
Xscl=1
Ymin=-2
Ymax=6
Yscl=1



Range is 15 cm; data values range from 60 cm to 75 cm tall.

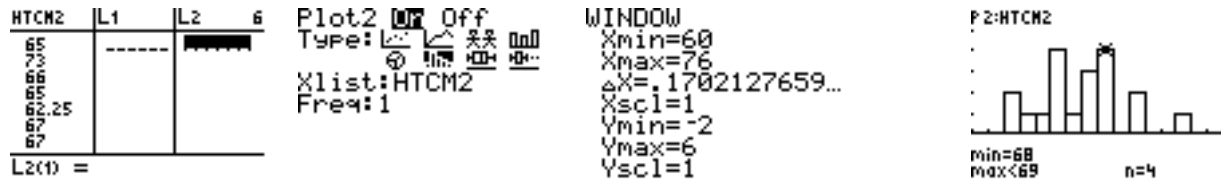
Mode is 63.5 cm tall; the most frequent data value is 63.5 cm tall. From the graph it appears that the mode is a data value that is equal to 63 cm and less than 64 cm tall. Based on the portion of the list of data shown above and the histogram, it is possible to see that the interval from 63 cm to less than 64 cm has the three data values visible in the data list of 63, 63.5, and $63\frac{1}{2}$. From the histogram, it is also possible to see that the interval from 71 cm to less than 72 cm has a frequency of two and might hold a second mode; however, what is not visible from the data list shown above is that this set of data does not have a second mode since the interval from 71 cm to less than 72 cm has two distinct heights: 71 cm and 71.5 cm. Thus, there is only one mode in this set of data (63.5 cm).

Median is 65 cm tall; the middle of the data values is 65 cm, or half the people surveyed are 65 cm or taller and half the people surveyed are 65 cm or shorter.

Mean is 66.5 cm tall (to the nearest tenth); if all the people surveyed were the same height, they would be about 66.5 cm tall, or 66.5 cm tall is a balance point for all the data values.

Possible conclusion: since the three measures of central tendency are relatively spread out – the mode is less than the median and the mean is greater than the median – the median is probably the best way to describe this set of data. The mean appears to be stretched to a higher value due to a high data value of 75 cm tall and the mode is not enough to counteract the highest data value. The histogram supports a conclusion that the data is relatively spread out and the median value of 65 cm tall as a reasonable average height of people surveyed.

How tall are you in centimeters? (Note that this set of data is from a different class.)



Range is 10.75 cm; data values range from 62.5 cm to 73 cm tall.

Mode is 68 cm tall; the most frequent data value is 68 cm tall. From the graph it appears that there are two modes because the intervals may include multiple data values within the same interval. When using the TI-73 Explorer to calculate the mode for the set of data in the list for HTCM2, 68 is correctly calculated as the mode of this set of data with a frequency of 4 (note that 68 will appear on the TI-73 Explorer home screen within a set of braces); in this set of data there are three data values of 66 cm and one data value of 66.5 cm, which results in a frequency of 4 for the interval from 65 cm to less than 66 cm but does not result in a second mode for this set of data.

Median is 67 cm tall; the middle of the data values is 67 cm, or half the people surveyed are 67 cm or taller and half the people surveyed are 67 cm or shorter.

Mean is 66.5 cm tall (to the nearest tenth); if all the people surveyed were the same height, they would be about 66.5 cm tall, or 66.5 cm tall is a balance point for all the data values.

Possible conclusion: It is interesting to note that the mean is slightly lower than both the median and the mode, and there is an outlier value of 73 cm tall (the maximum data value); however, the mean and the median are relatively close in value. The histogram supports a conclusion that the data is relatively clumped together (except for the outlier data value), and 67 cm tall is a reasonable average height of people surveyed.