

AP STATISTICS

AP Statistics students will be tested on content area I on the third day of school. Check the objectives of content area I at AP Central, course description, at the link below:
http://apcentral.collegeboard.com/apc/public/courses/teachers_corner/2151.html

From four content areas presented in AP statistics, topic of exploring data has already been covered in mathematics and science classes prior to senior year.

Study and review the required topics from available sources. A list of suggested sources is provided.

Suggested Sources:

Primary Textbook: *The Practice of Statistics*, Yates, Moore, McCabe, W.H. Freeman and Company, New York, NY 1999 (first edition)

- Bohan, James F. *Statistics: Preparing for the Advanced Placement Examination*. New York: AMSCO School Publications, 2000.
- Brase&Brase. *Understandable Statistics*. 7th ed. USA: Houghton Mifflin Company, 2003.
- Sternstein, Marin. *Barron's How to Prepare for the AP Statistics Examination*. 2nd ed. New York: Barron's Educational Series, Inc. 2000.

Note that most of other high school, AP, or college textbooks on introductory statistics can be used for your summer preparation.

You can also use Internet to review the basics of descriptive statistics:

www.mste.uiuc.edu/hill/dstat/dstat.htm

www.chelt.ac.uk/acadres/stats/descript.htm

www.habermas.org/stat2f98.htm

www.anu.edu.au/nceph/surfstat/surfstat-home/surfstat.html

Working With Data.

(Source:

<http://www.suhd.k12.ca.us/sub/APClasses/StatsSummer/SummerAssignmentPart%202.doc>

Mr. Arreola's web page for AP Stat)

On the next page you will find a set of data. Do not turn to it yet because I want you to focus on some things when you do so. When you look at the data, focus on the following:

- record your initial reaction to seeing the data
- what the data is about
- look for any trends or patterns in the data
- record your reactions while you examine the data in the table

Go ahead and look at the data set and spend some time examining it. Once you have an idea what it is about, go ahead and begin your work on page 3. Answer the questions which follow IN FULL SENTENCES.

Summer Assignment Data Set

The following data set is of sample SAT Verbal and Math scores with Grade Point Average. You will be asked to do several different things with this data set and answer some basic statistical questions based on the information in the data set

450	470	2.3	590	440	2.4	580	600	3.4	640	610	3.3
640	700	3.4	750	720	3.4	630	510	2.9	670	740	3.6
580	710	3	690	680	2.5	750	730	2.8	660	620	3.9
710	710	4.1	610	770	3.6	530	650	2.5	570	720	3.1
690	640	3.9	620	630	2.6	650	660	2.8	480	680	2.6
570	660	3.1	680	700	3.6	680	760	2.9	650	570	2.3
640	710	3.8	520	700	2.9	640	600	2.1	640	740	3.2
610	690	3.3	550	690	2.6	540	600	1.4	670	620	3.3
650	700	3.8	700	710	3.8	630	600	3.4	550	660	2.7
660	610	3.6	580	730	3.6	600	690	3	630	590	2.7
580	550	3.3	550	630	2.5	620	770	3.1	580	620	2.8
580	610	2.5	650	670	3.5	630	710	3	640	580	2.3
640	700	3.6	580	600	2	580	550	3.4	680	640	2.6
400	610	2.9	570	610	3	550	650	2.8	620	550	2.7
500	680	2.7	530	630	2	680	610	2.8	520	730	3
660	650	2.8	530	580	2.3	780	690	4.3	720	600	3.7
550	500	3.3	700	700	2.3	440	640	2.1	500	520	2.3
570	630	2.3	530	680	2.1	520	610	2.1	680	800	3.4
480	580	2.3	630	640	3	570	670	3.6	540	640	3
680	620	3.3	590	610	3.3	680	490	3.2	480	570	2
560	620	2.8	550	660	3	550	780	3.5	600	620	3.1
550	660	2.7	550	670	3.2	540	570	2.4	600	710	2.4
560	720	2.4	590	660	2.3	580	670	2.1	570	520	2.5
740	740	3.4	540	650	3.3	620	720	2.9	550	570	3.2
610	650	2.8	750	730	3.3	610	620	2.8	580	670	2
490	600	2.4	720	800	3.9	570	600	2.3	590	730	3.6
570	560	2.3	630	660	2.1	430	710	3.4	540	690	2.4
680	720	3.5	550	560	2.6	660	620	2.6	540	720	3.3
600	670	3.3	640	770	2.4	490	560	2.5	600	680	2.9
740	720	4.4	640	710	3.3	520	610	2.3	650	640	2.4
590	610	2.8	600	750	3.1	760	710	4.6	540	620	2.4
480	680	2.9	680	650	3.6	600	700	3.8	500	620	2.3
520	770	3.3	560	670	2.9	520	640	2.3	640	760	2.5
630	600	3.7	570	620	2.4	480	620	2.6	580	570	2.6
580	650	3.3	480	610	2.0	580	560	2.7	630	620	3.4
610	670	3.6	360	600	2.4	610	620	3.3	610	670	2.3
690	630	3.3	560	630	2.9	690	620	3.7	710	640	3
530	600	3.1	630	640	3.5	640	620	3.6	500	530	3
490	700	2.2	660	700	3.4	640	660	3.6	480	520	2.4
500	540	3.3	710	660	2.3	570	630	2.9	480	670	2.9
660	750	4.0	660	700	2.9	580	710	3.1	520	790	4.8
590	650	3.1	570	640	2.4	610	630	3.0			
660	660	3.6	520	580	2.8	640	650	3.1			
560	660	3.4	570	590	2.3	460	680	3.4			
590	600	2.4	530	600	2.5	660	610	2.3			
600	550	2.3	580	630	2.4	570	580	2.1			
510	520	3	620	690	2.9	560	570	2.8			
640	710	2.9	530	710	2.1	570	660	3.2			
600	590	3.4	540	640	3	530	580	2.5			
500	660	2.3	550	600	2.3	490	740	2.8			
620	500	2.6	540	660	2	530	630	3.3			

1. What is the data about?

2. What information are you able to make out by looking at the data set in a table format?

3. What useful information is *not* included? Why is it important to have a table of data then?

4. What concerns do you have about the data set? That is, is there any information about the data set that is not present that a researcher might wish to know?

Below you will find the summary statistics for the data in the table. Use it to answer the questions.

Summary statistics

Math	200	645.3	4412.975	66.43023	640	360	440	800	600	700
GPA	200	2.9125	0.33798367	0.5813636	2.9	3.4	1.4	4.8	2.4	3.3

5. Look at the average and the median SAT Verbal score. Notice that the mean is higher.

What does this tell you about the scores?

6. Look at the average and the median SAT Math score. Notice that the mean is higher.

What does this tell you about the scores?

7. What differences do you see in terms of how spread out the scores are for each part of the

test? Which columns tell you this?

8. The middle 50% of all verbal scores and math scores ranged between which values?

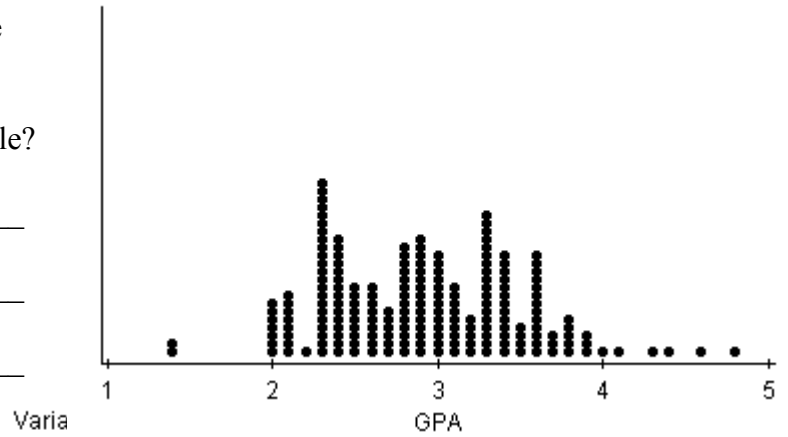
4 : 0134
 4 : 68

11. Tell the value of each data point in **bold** is.

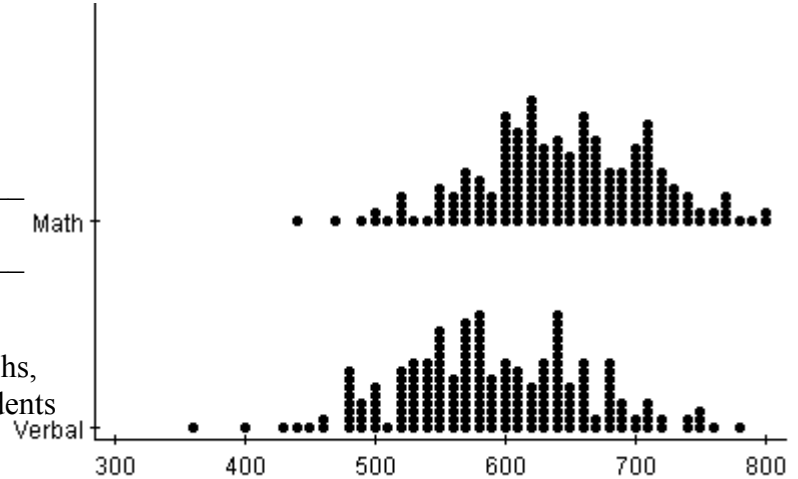
12. What is the main disadvantage of making a stem and leaf plot by hand?

At the right are some dot-plots of the three variables in the data set.

13. What is the mode of each variable?



14. How many students had an SAT Math score of 500 or less?



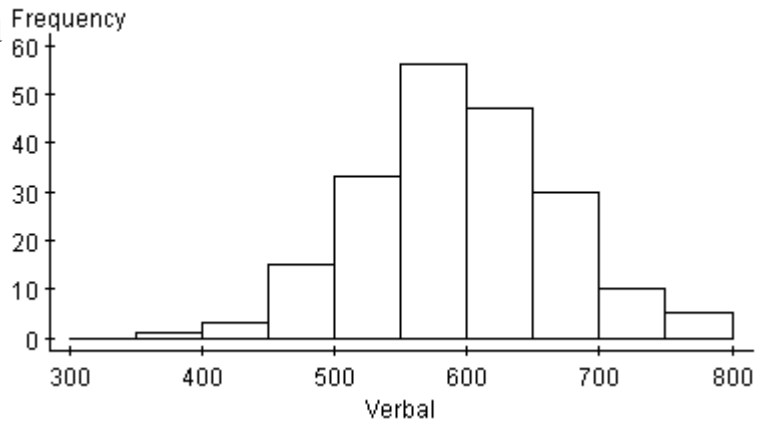
15. Looking at the two dot-plot graphs, on which part of the test did students do better? Justify.

16. What information is gained by looking at the dot-plots and stem and leaf plots that is not present in the data summary?

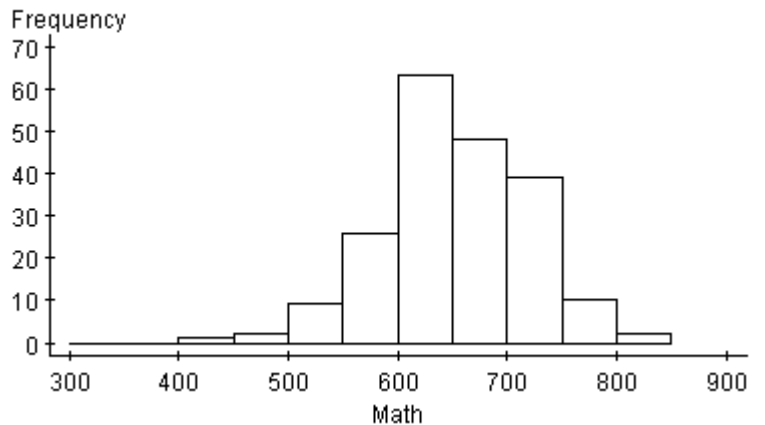
17. Does a dot plot tell you how an individual student did in all three categories?

Here are some histograms of the data.

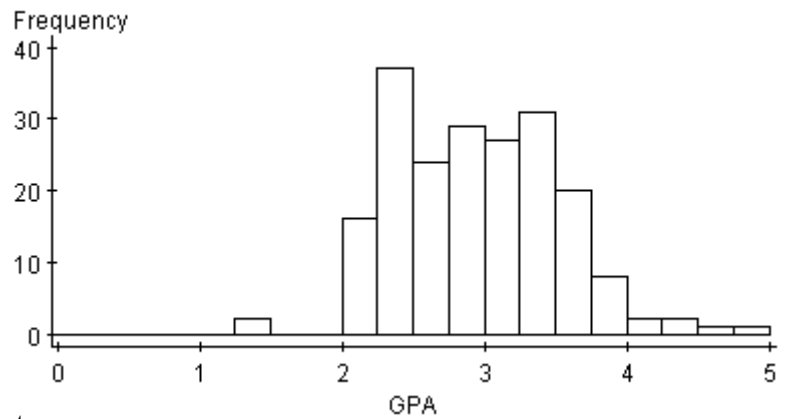
18. How do the histograms on verbal and math tell you that the mean has to be larger than the median?



19. What is the major advantage of making a histogram over a dot-plot if you are making one by hand?

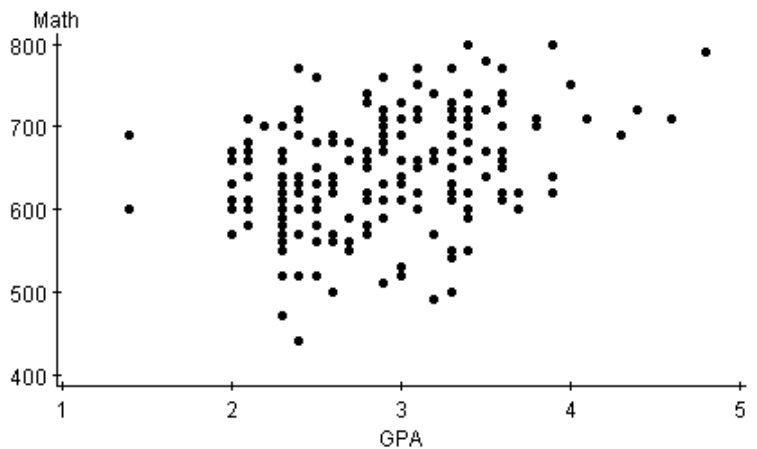


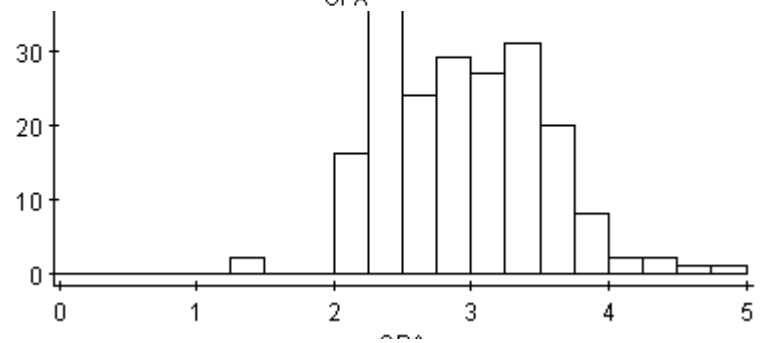
20. SAT scores range from 200-800. what is weird about the graph at the right about math scores? why did the computer make the graph this way?



21. Does a histogram provide any information on how individual students perform on the three categories?

22. The scatter plot of Math vs. GPA is at the right. Does there appear to be a relationship between the two variables? If so, describe it. What does the scatter plot suggest about the math score on the SAT?



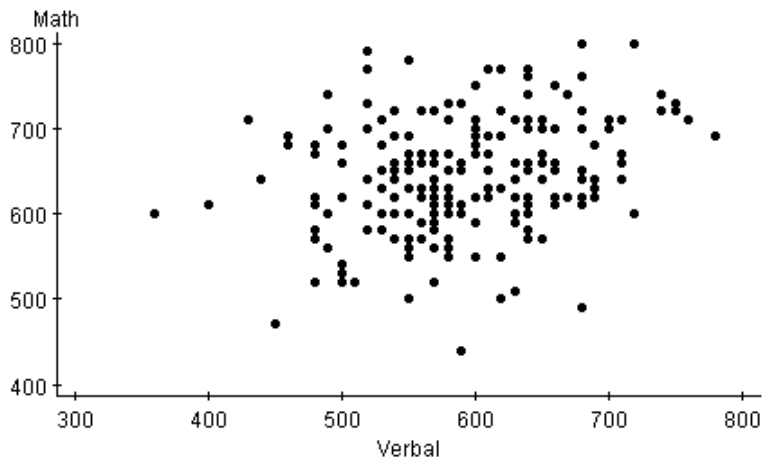


23. The scatter plot of Verbal vs. GPA



is at the right. Does there appear to be a relationship between the two variables? If so, describe it. What does the scatter plot suggest about the verbal score on the SAT?

24. The scatter plot of Math vs. Verbal is at the right. Does there appear to be a relationship between the two variables? Is this surprising?



25. Why do you think scatter plots are more useful than pairs of dot plots, stem and leaf plots or histograms?

26. Under which circumstances would you use each of the graphs in the assignment? Consider what the purpose of each graph is and when it is convenient to use.

27. When looking at data for analysis and interpreting results, why is it a good idea to look beyond the table of collected data? How does looking at the data in these ways help the researcher and anyone looking at the results?
