BIO 401

(FINAL TERM SOLVED QUESTIONS SPRING 2021)

1. Four windows of SPSS:

 Originally it is an acronym of Statistical Package for the Social Science but now it stands for Statistical Product and Service Solutions

The Four Windows:

- Data Editor
- Output Viewer
- Syntax Editor
- Script Window

2. What is range rule of thumb?

The Range Rule of Thumb suggests that values are unusual if they are outside of these limits.
Maximum Usual Value = $\mu + 2\sigma$
Minimum Usual Value = $\mu - 2\sigma$

3. Three methods of sampling?

- Simple random sample
- Systematic sampling
- stratified sampling
- cluster sampling

4. Define joint probability?

Joint probability is a statical measure that calculates the likelihood of two events occurring together and at the same time. joint probability is the probability of event of Y occurring at the same time that event X occurs.

5. cause-specific mortality rate:

$$\text{cause-specific mortality rate} = \frac{\text{number of deaths asssigned to a specific cause during a gien time interval}}{\text{mid-interval population}} \times 10^n$$

The cause-specific mortality rate is the mortality rate from a specified cause for a population.
The numerator is the number of deaths attributed to a specific cause.
The denominator remains the size of the population at the midpoint of the time period

6. Define SPSS:

 Originally it is an acronym of Statistical Package for the Social Science but now it stands for Statistical Product and Service Solutions
 One of the most popular statistical packages which can perform highly complex data manipulation and analysis with simple instructions

7. PROBABILITY

When we talk about probabilities, we talk about the probability of the events that might occur in some random experiments.

8. RANDOM EXPERIMENT

An experiment which produces different outcomes in multiple repetitions of the experiment, performed under similar conditions, is called a Random Experiment.

9. Regression equation:

Regression equation describes the regression line mathematically

- Intercept
- Slope

10. Properties and uses of the Inter-Quartile Range

- The IQR is generally used in conjunction with the median. Together, they are useful for characterizing the central location and spread of any frequency distribution, but particularly those that are skewed.
- For a more complete characterization of a frequency distribution, the 1st and 3rd quartiles are sometimes used with the minimum value, the median, and the maximum value to produce a five number summary of the distribution.

- Together these five numbers provide a good description of the center, spread and shape of the distribution.

11. Percentiles

In an array the Percentiles are 99 values/cut-points that divides the values into 100 equal parts.
Denoted by p_k
k = the k-th value

12. Define Regression Analysis?

In statical modeling, regression analysis is a set of statical processes for estimating the relationship between a dependent variable (often called the 'outcome' or 'response' variable) and one or more independent variables (often called 'predictors', 'covariates', 'explanatory variables', or 'features'.

13. Coefficient of Variation

- The Standard Deviation is useful as a measure of variation within a given set of data.
- However, comparing dispersion in two datasets on the basis of standard deviation may lead to fallacious results.
- Two means may be quite different.
- when one desires to compare the dispersion between two or more than two data sets then we prefer using coefficient of variation.

$$C.V.(x) = \frac{s}{x} \times 100$$

14. Types of events:

- Simple event
- Composite event

If an Event consists of exactly one outcome, it is called **Simple Event.**
If an event consists of more than one outcome, it is called **compound event.**

There are various other types of events like:

- Mutually Exclusive Events
- Collectively Exhaustive Events
- Equally Likely Events
- Independent and Dependent Events
-

15. Skewness

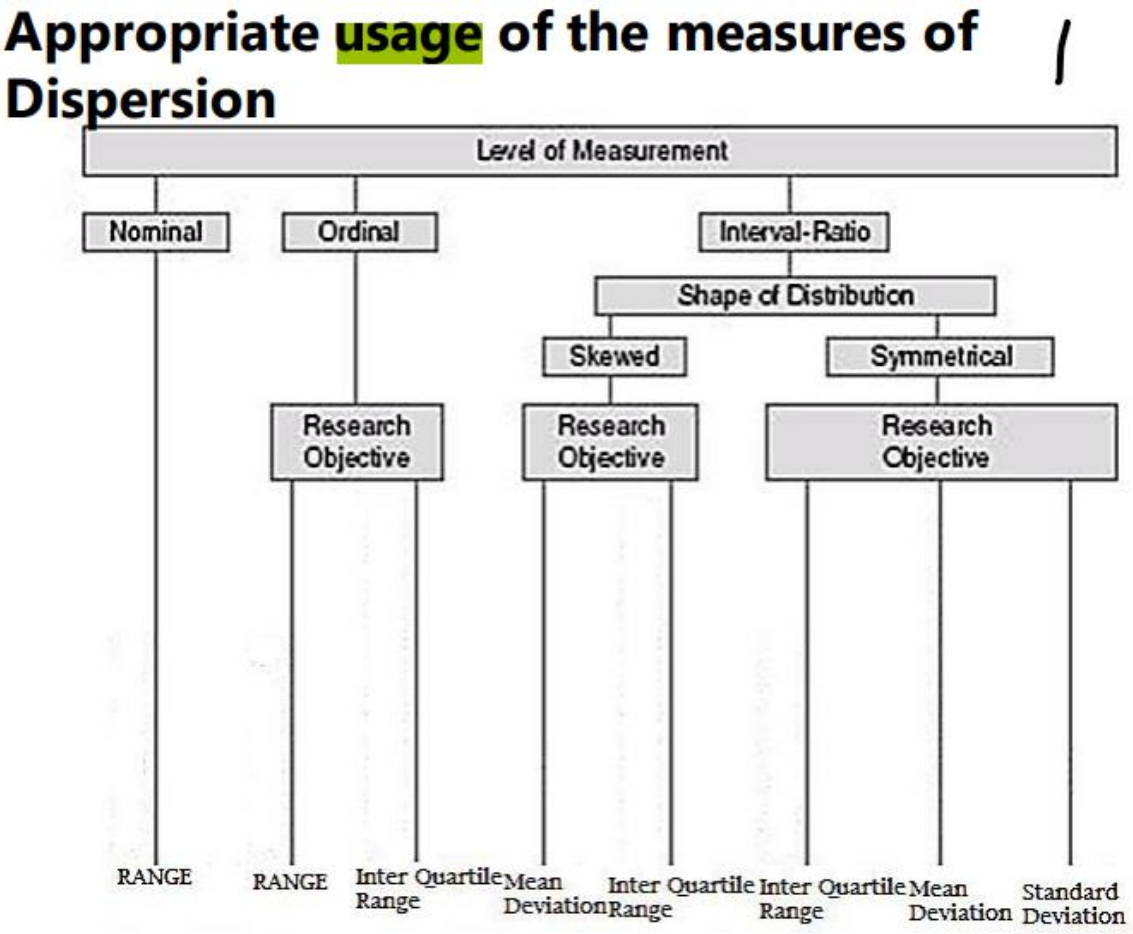
"It is defined as the departure from Symmetry"

Coefficient of Skewness help us to measure amount of the departure from symmetry.

It is denoted by s_k

Karl Pearson (1857 – 1936) discovered it.

16.



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17. Cluster sample and quota sampling

Cluster samples

sample only certain clusters of members of a population.

E.g., city blocks, firms.

Quota sample

– obtain a cross-section of a population, e.g., by age and sex for individuals or by region, firm size, and industry for businesses. This may be reasonably representative.

18. Correlation Coefficient

Statistic showing the degree of relation between two variables

19. Dispersion:

Dispersion is defined as the extent to which the observations in the dataset are spread away from the central value.
If all the values in the data are the same then there is no dispersion.
Other terms used synonymously with dispersion includes variation, spread and scatter.

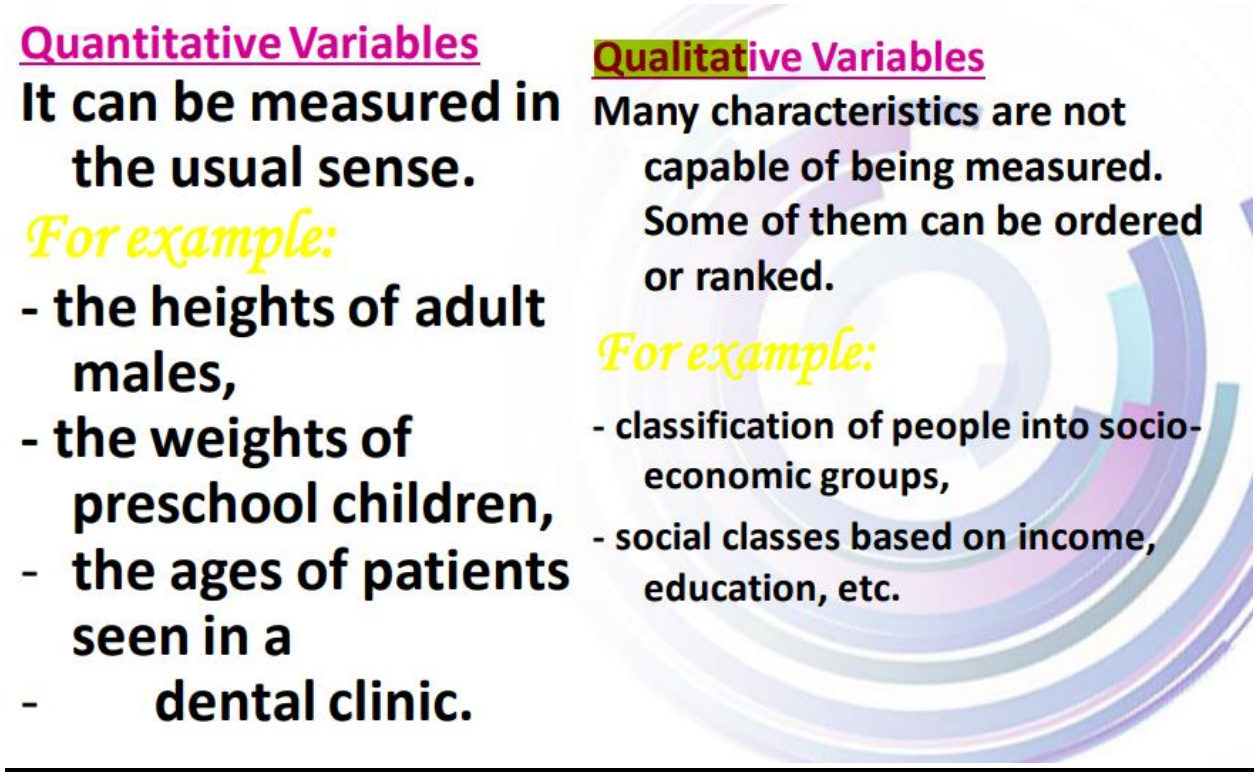
20. Receiver Operating Characteristic (ROC) Curve

Receiver Operating Characteristic (ROC) Curve, is a plot of the true positive rate against the false positive rate for the different possible cut points of the diagnostic test.

21. Bernoulli trail:

An experiment or a trial, whose outcome can be classified as either a success or a failure, is called a Bernoulli Trial.

22.



23.

Types of Quantitative Variables

A discrete variable

is characterized by gaps or interruptions in the values that it can assume.

For example:

- The number of daily admissions to a general hospital,
- The number of decayed, missing or filled teeth per child
- in an
- elementary
- school.

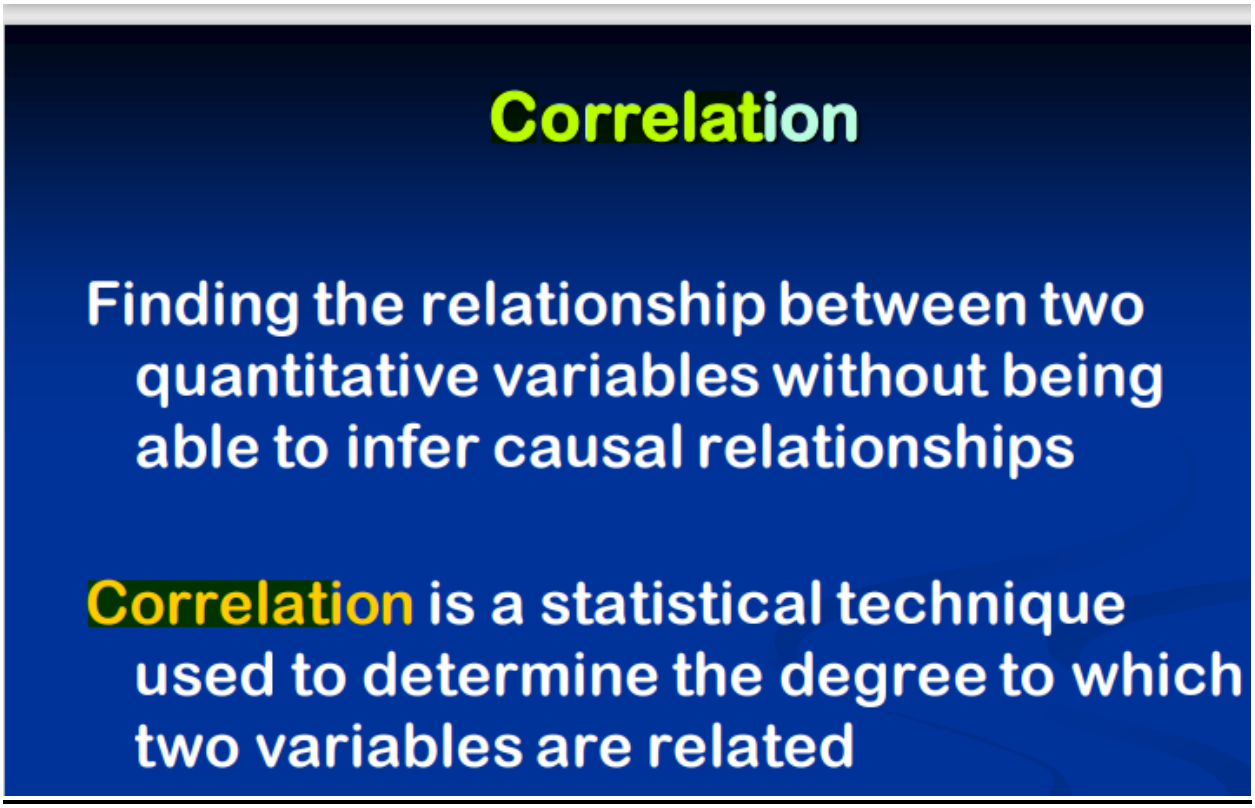
A continuous variable

can assume any value within a specified relevant interval of values assumed by the variable.

For example:

- Height,
- weight,
- skull circumference.

No matter how close together the observed heights of two people, we can find another person whose height falls somewhere in between.



25. Multiple Regression

Multiple regression analysis is a straightforward extension of simple regression analysis which allows more than one independent variable.

26. Population and sample

- A population is the collection of all the elements of interest.
- A sample is a subset of the population.

27. Important Terms

- Sporadic: disease occurs occasionally, irregularly
- Endemic: disease stays in population at low frequency
- Epidemic: sudden outbreak in disease above typical level
- Pandemic: epidemic over wide area (may be entire world).
- Morbidity: all reported cases of disease, illness, and disability
- Mortality: reported deaths due to a disease

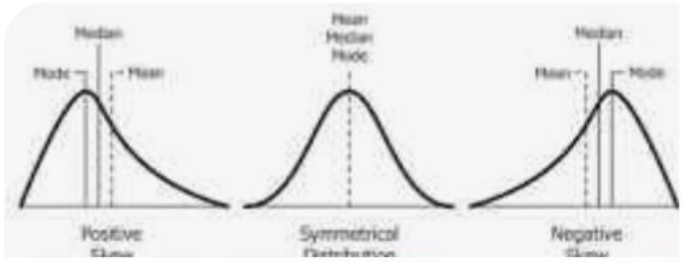
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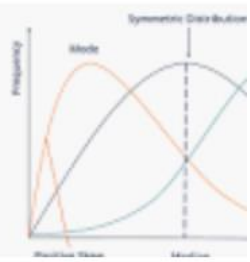
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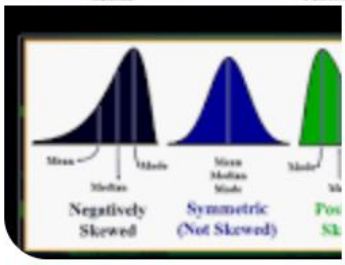
types of skewness

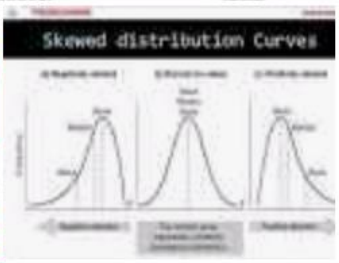
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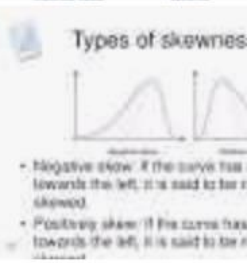
Types of skewness











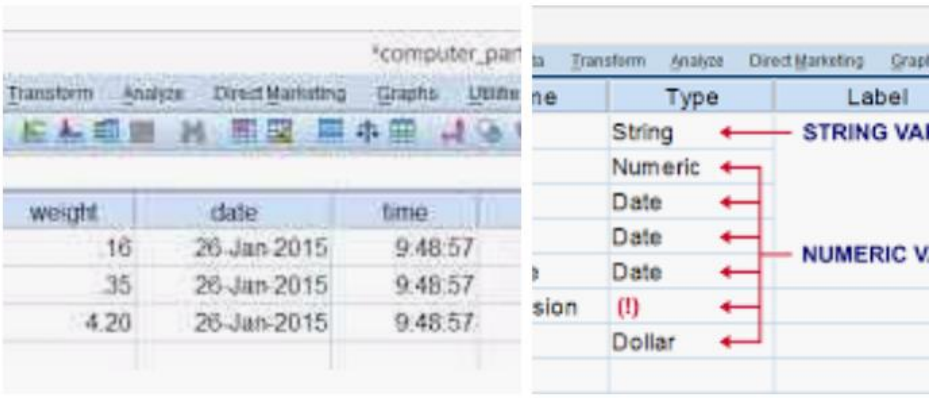
Broadly speaking, there are two types of skewness: They are **(1) Positive skewness and (2) Negative skewnes**.

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Types of Skewness - Statistics

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2 types of spss



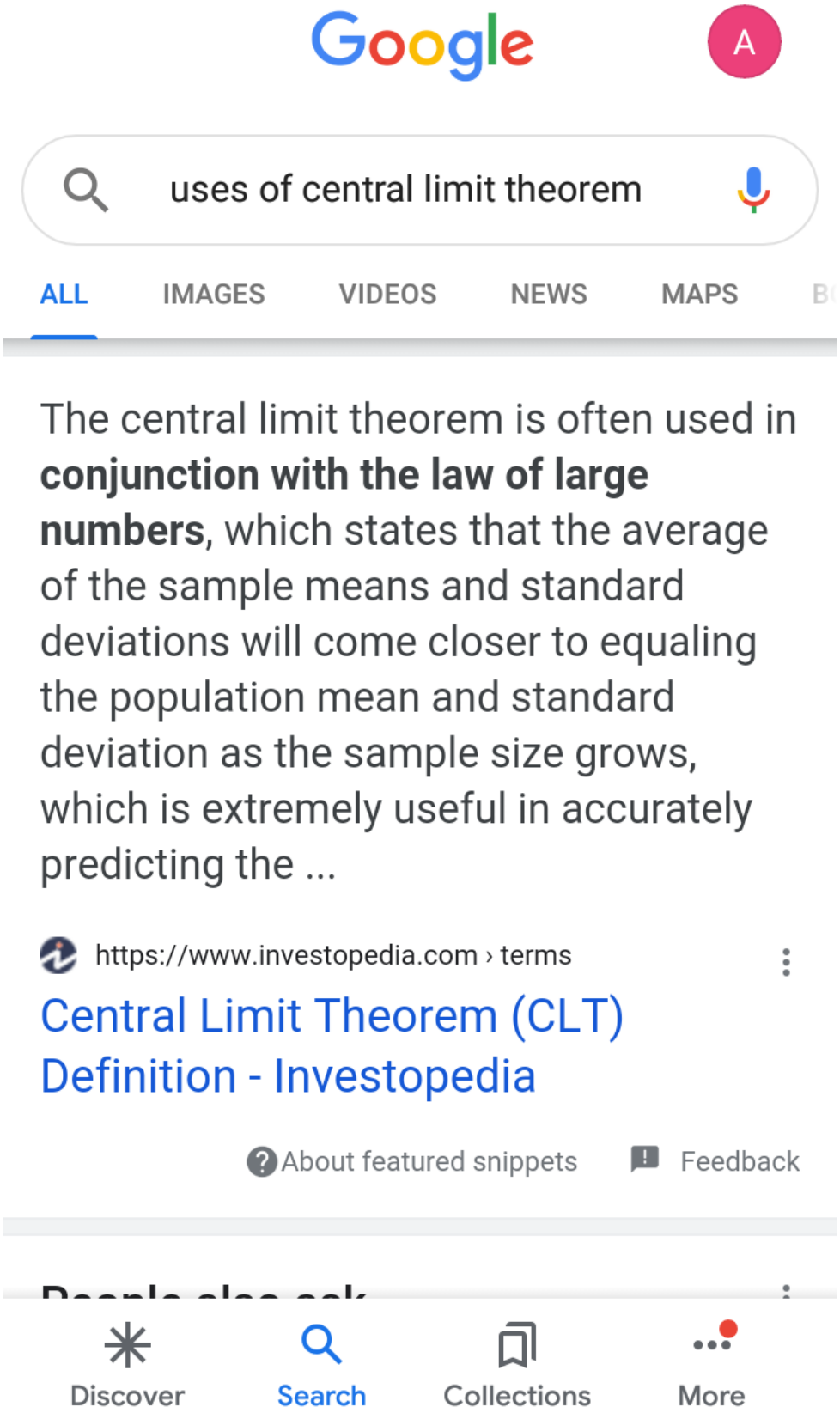
SPSS Variable Types

SPSS has 2 variable types: **Numeric variables** contain only numbers and are suitable for numeric calculations such as addition and multiplication. String variables may contain letters, numbers and other characters. You can't do calculations on string variables -even if they contain only numbers. 29-May-2021

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Variable Types and Formats - String

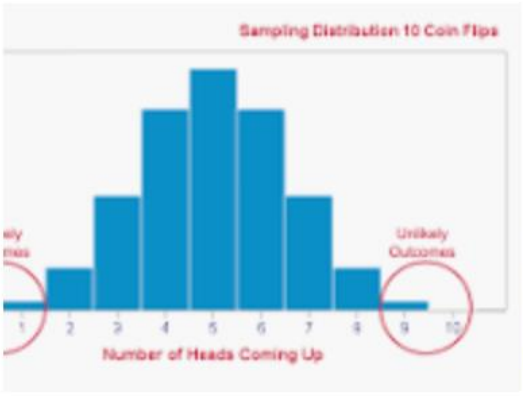
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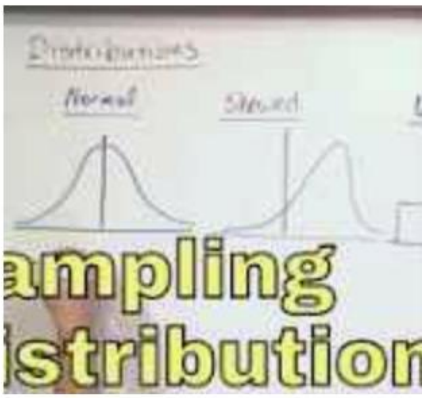

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The central limit theorem is often used in **conjunction with the law of large numbers**, which states that the average of the sample means and standard deviations will come closer to equaling the population mean and standard deviation as the sample size grows, which is extremely useful in accurately predicting the ...
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sample distribution in statistics

Probability distribution

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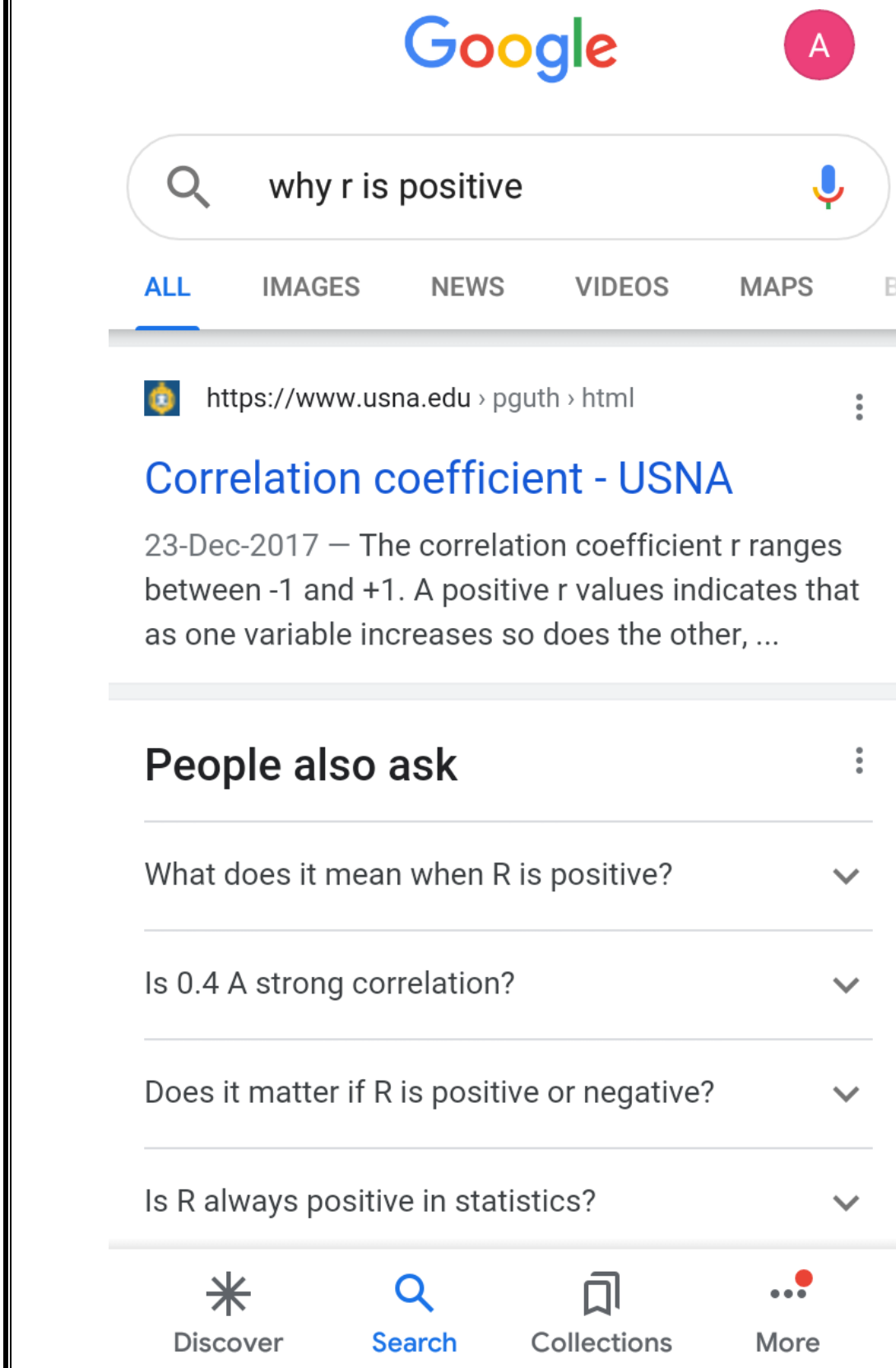


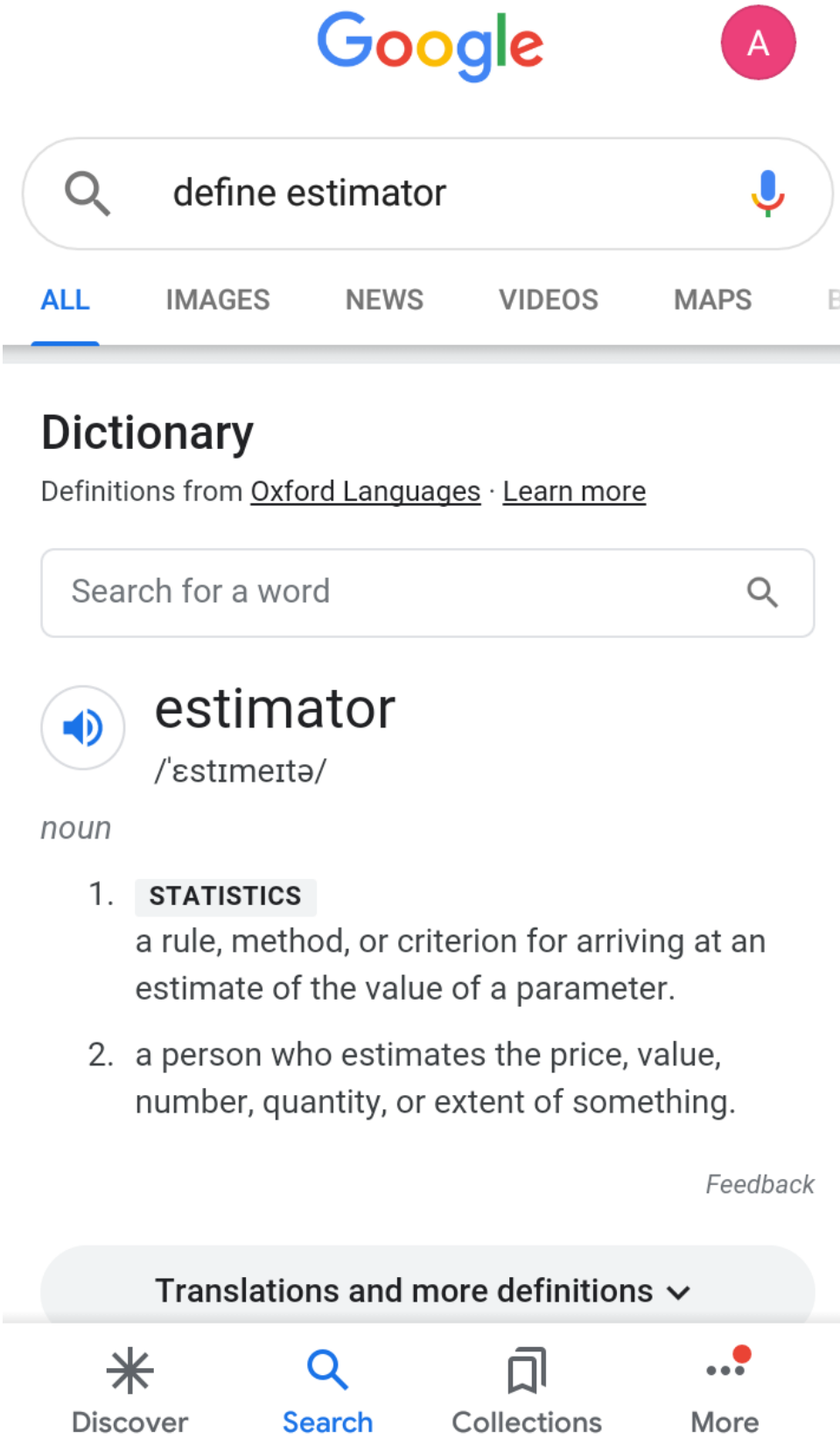
A sampling distribution is **a statistic that is arrived out through repeated sampling from a larger population**. It describes a range of possible outcomes that of a statistic, such as the mean or mode of some variable, as it truly exists a population.

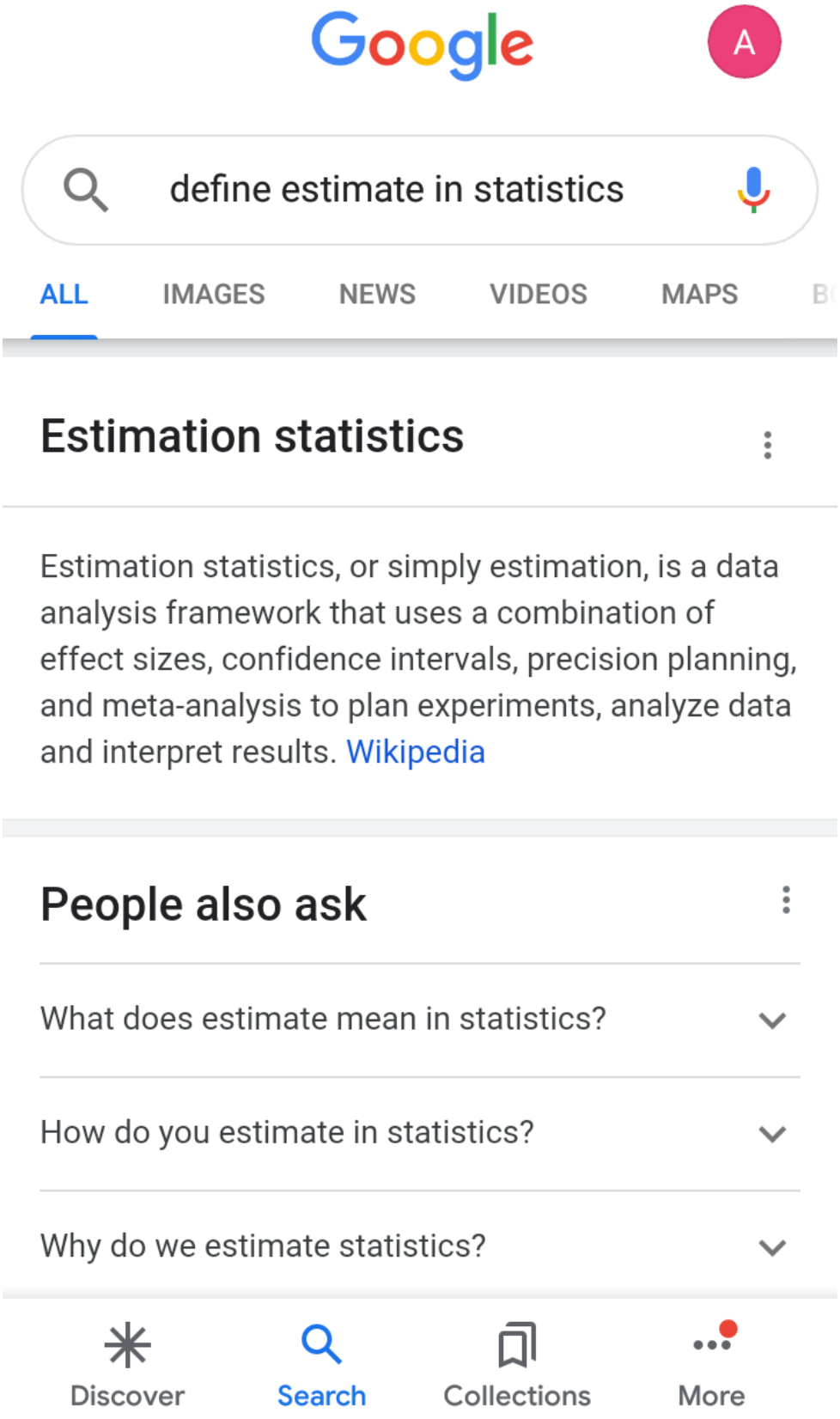
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Correlation coefficient - USNA
23-Dec-2017 — The correlation coefficient r ranges between -1 and +1. A positive r values indicates that as one variable increases so does the other, ...
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a rule, method, or criterion for arriving at an estimate of the value of a parameter.
2. a person who estimates the price, value, number, quantity, or extent of something.
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how would you sort the data by

How do you sort data in descending order?

To sort a range:

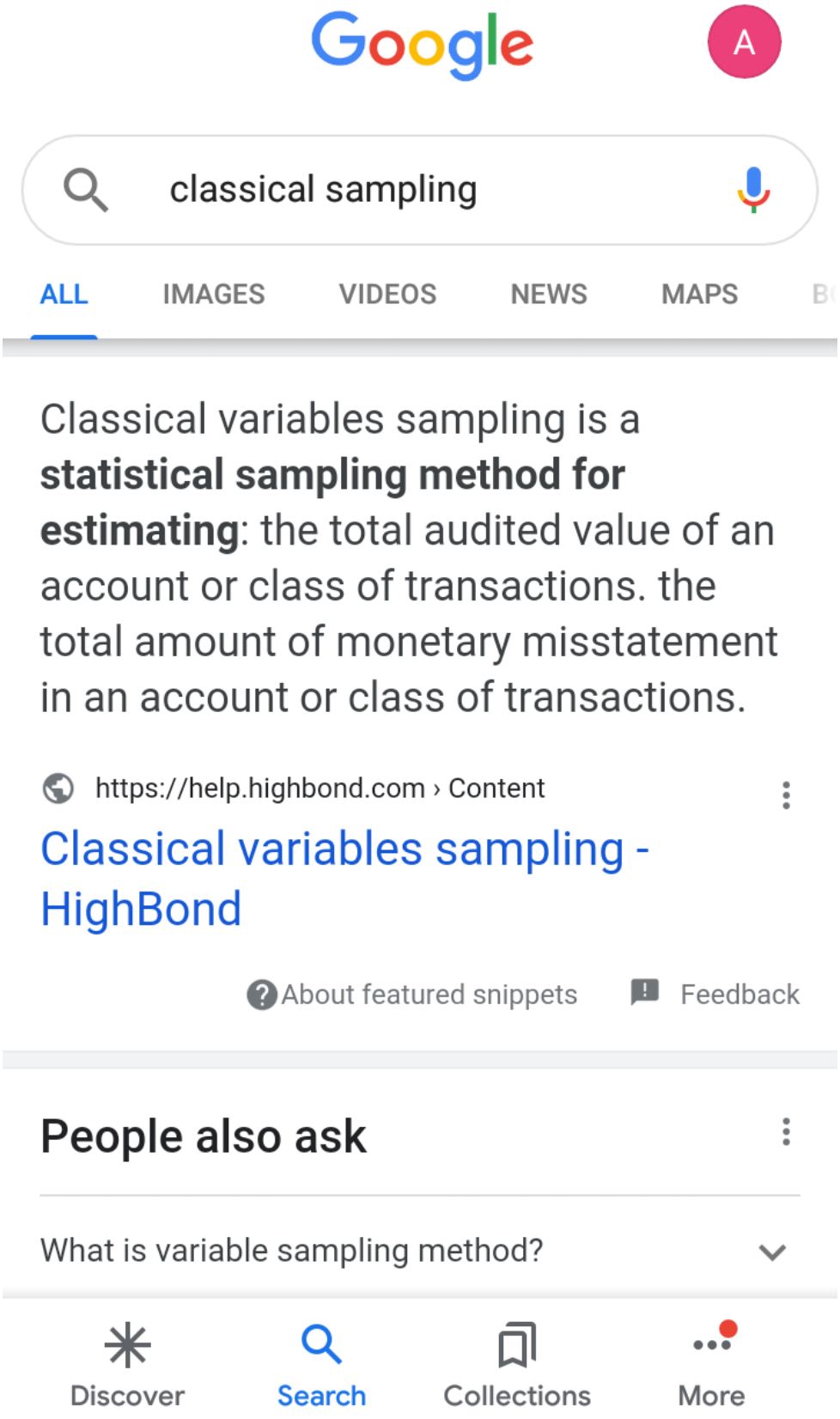
1. Select the cell range you want to sort. ...
2. Select the Data tab on the Ribbon, then click the Sort command.
3. The Sort dialog box will appear. ...
4. Decide the sorting order (either ascending or descending). ...
5. Once you're satisfied with your selection, click OK.
6. The cell range will be sorted by the selected column.

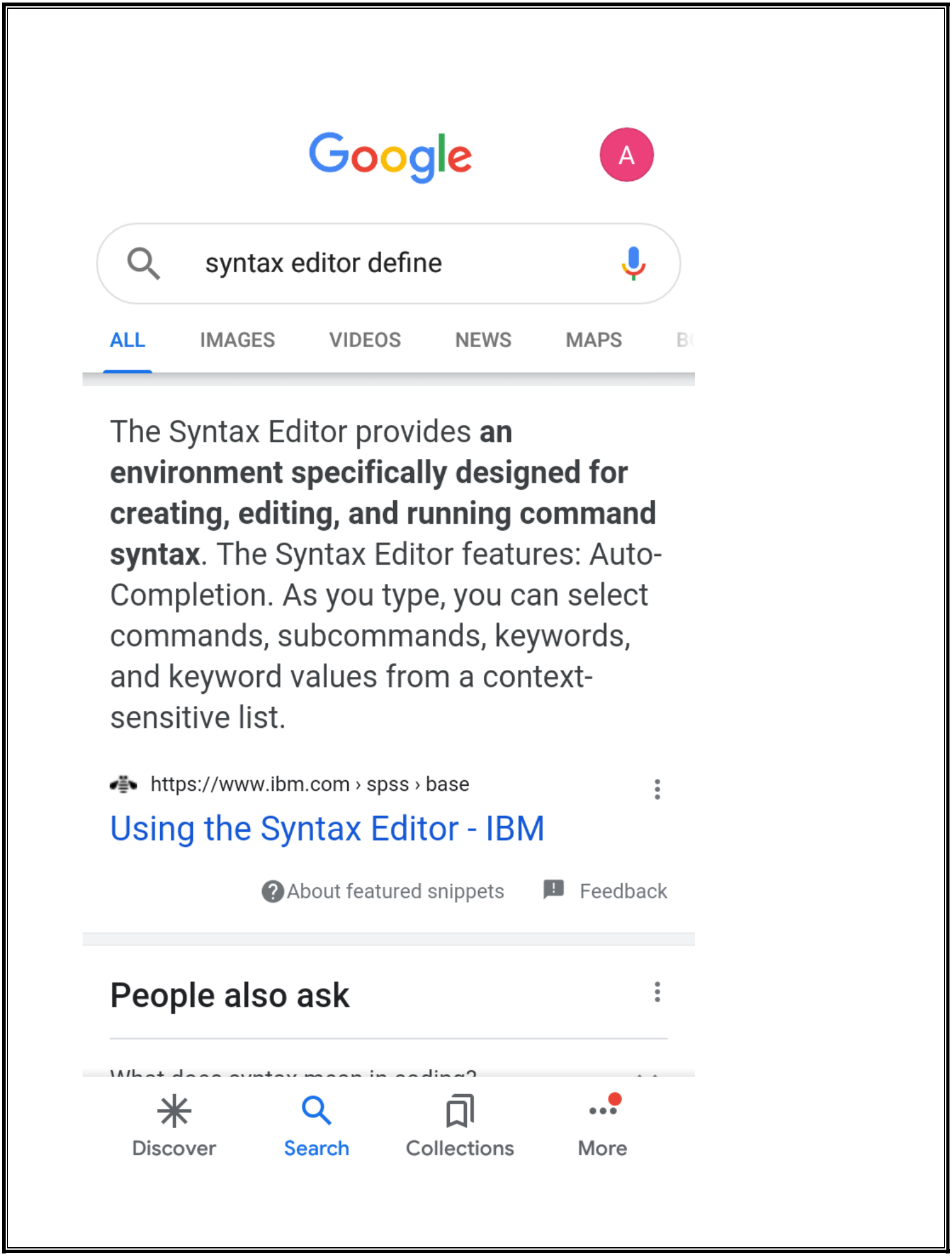
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Excel 2016: Sorting Data - GCFLearnFree.org

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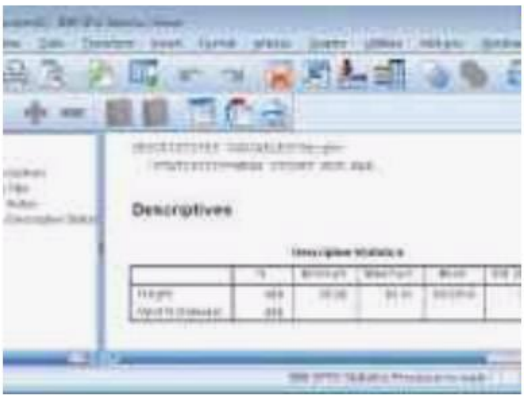

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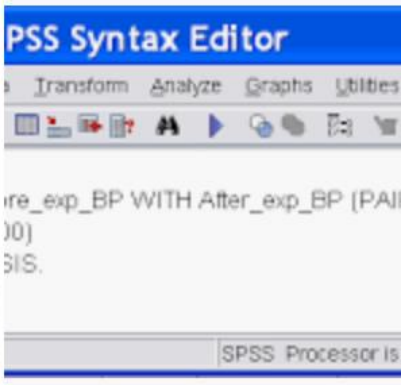
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Create SPSS program command lines by creating a new syntax editor window, and key in an SPSS program. To do this, go to the File Menu, go down to “New”, and select “**Syntax**”. A new syntax editor window is now created. You can enter your own SPSS program.

http://calcnet.mth.cmich.edu › org

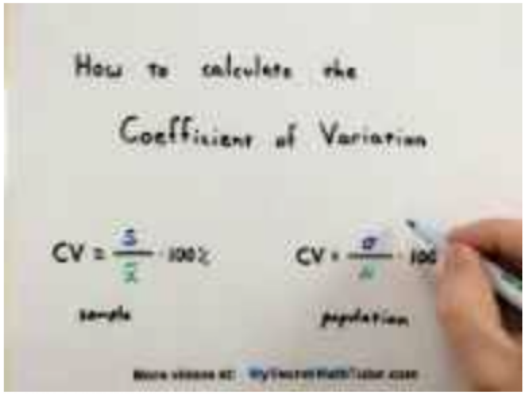
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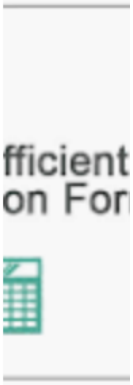
coefficient of variation

Coefficient of variation

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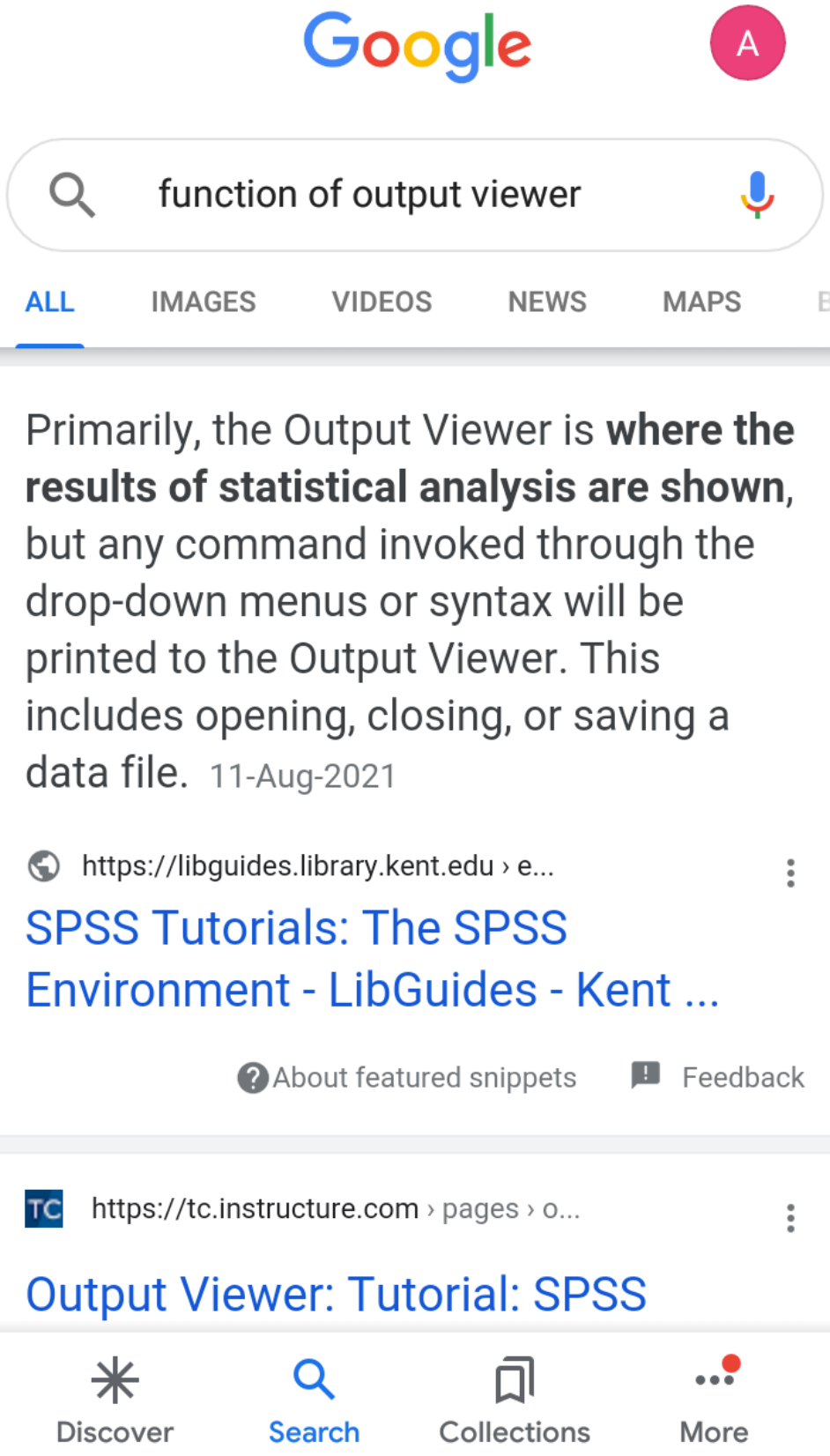


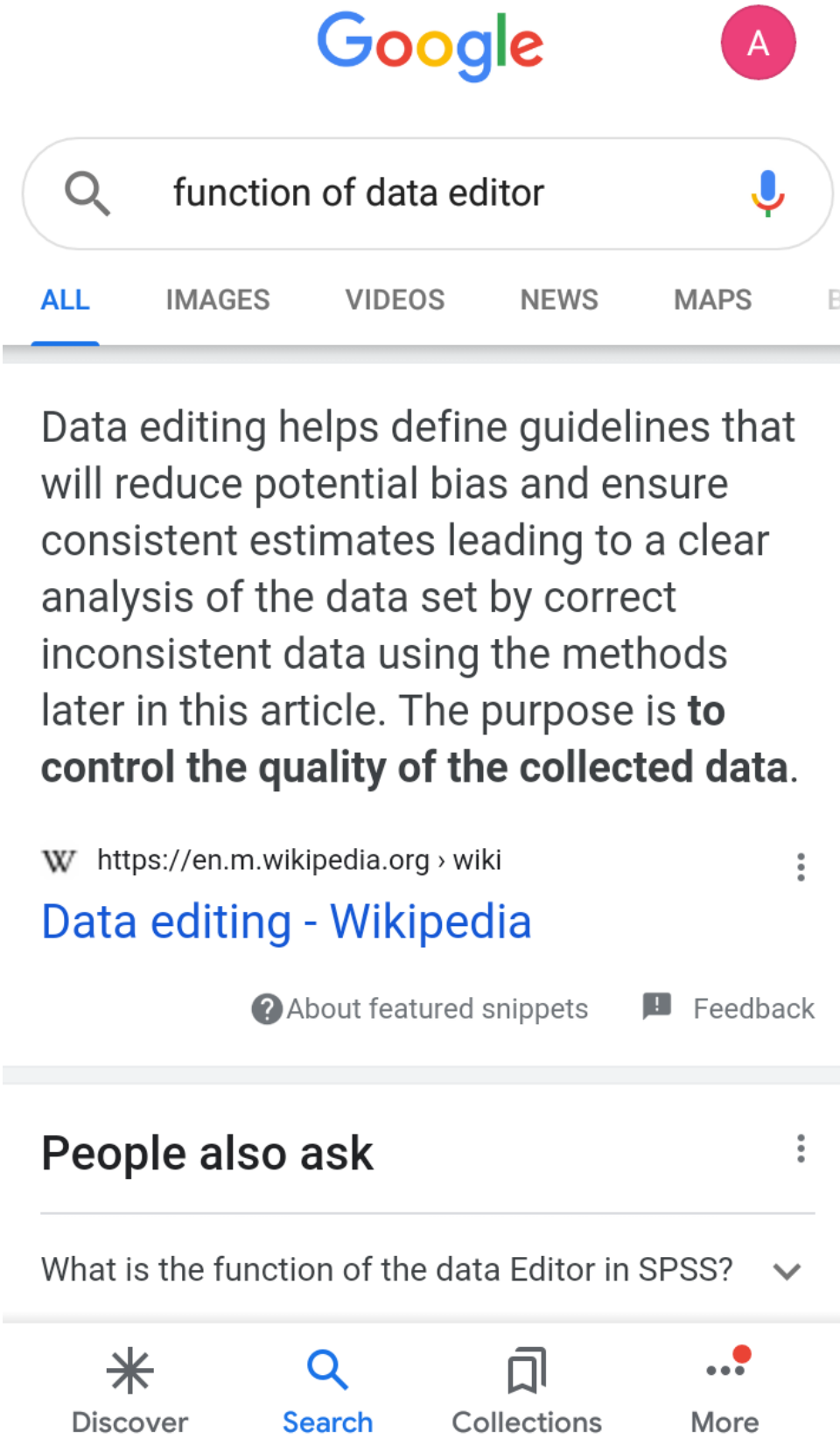
The coefficient of variation (CV) is **the ratio of the standard deviation to the mean**. The higher the coefficient of variation, the greater the level of dispersion around the mean. It is generally expressed as a percentage. ... The lower the value of the coefficient of variation, the more precise the estimate. 13-Oct-2016

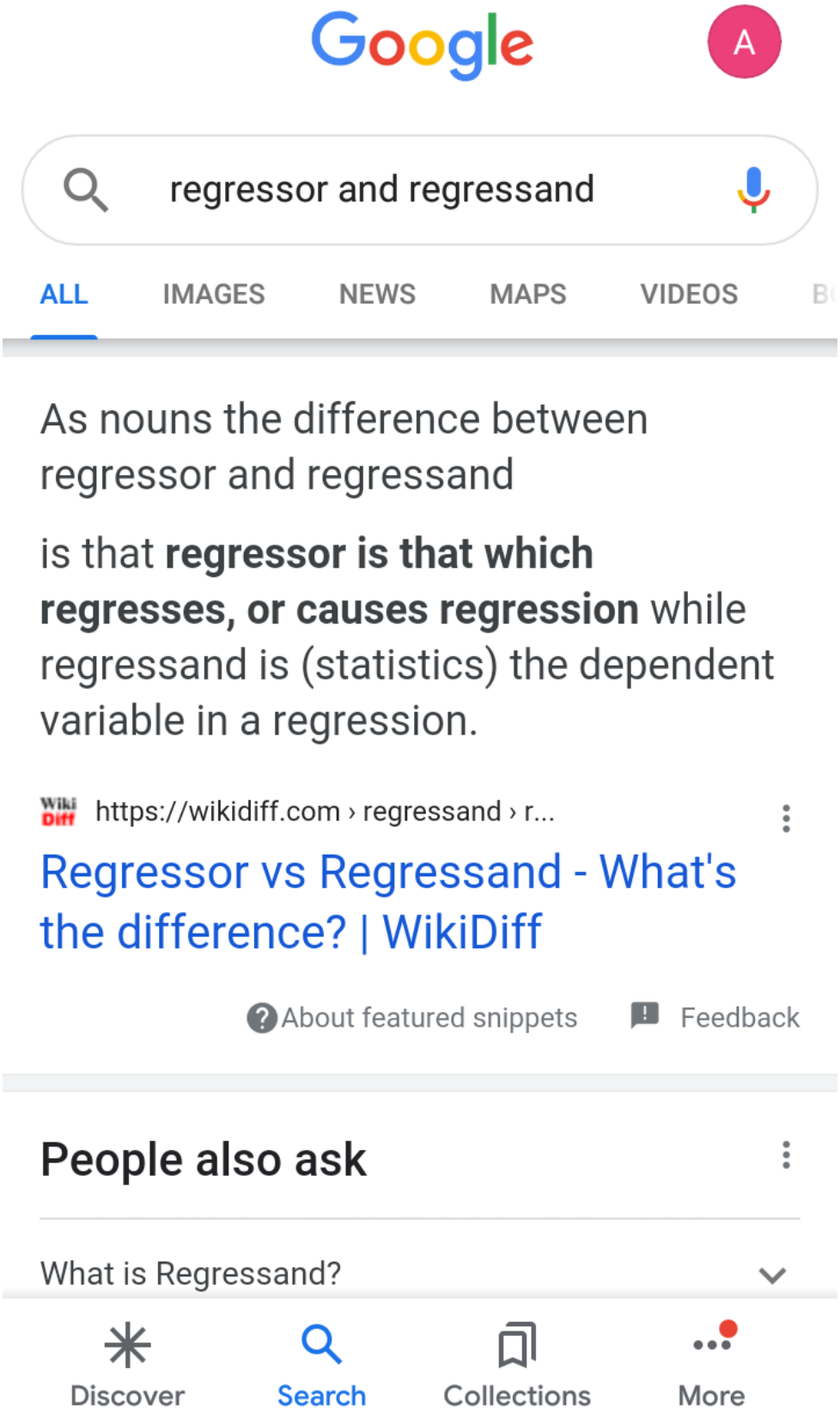
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Coefficient of variation / CV -

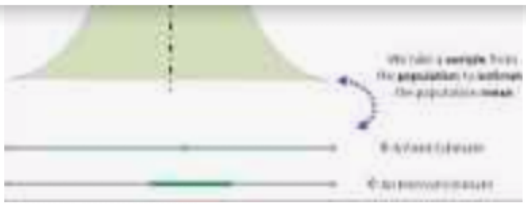
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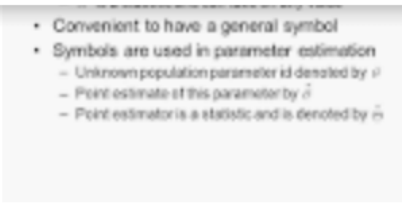

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Primarily, the Output Viewer is **where the results of statistical analysis are shown**, but any command invoked through the drop-down menus or syntax will be printed to the Output Viewer. This includes opening, closing, or saving a data file. 11-Aug-2021
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point estimate definition





Point estimation, in statistics, **the process of finding an approximate value of some parameter**—such as the mean (average)—of a population from random samples of the population. ... It is desirable for a point estimate to be: (1) Consistent. The larger the sample size, the more accurate the estimate. (2) Unbiased.

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