MODULE 1 LIVE LECTURE

INFERENTIAL STATISTICS AND ANALYTICS

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- Textbook and software
- Assignments
- Basic statistics review
- Quiz 1
- Module 1 Homework
- Course project phase 1
- Module 1 Live classroom Grading
- Summary

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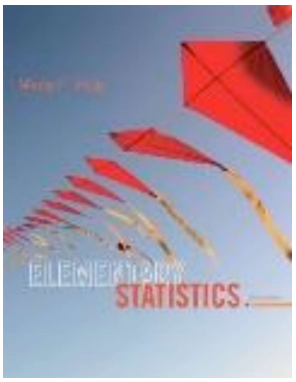
TEXTBOOK



- Text: Elementary Statistics
- Author: Triola
- Publisher: Pearson
- ISBN: 9780321836960
- Our eTextbook is readily available for you in our course. To access your eTextbook for this course, visit the eText link.
- STATDISK is a software program designed specifically for use with textbooks in the Triola Statistics Series. You can try STATDISK Online or download Statdisk 13 (www.statdisk.org)

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ASSIGNMENTS

Discussions: There are scheduled weekly discussion questions. Your comments/responses must be clear, concise, and complete. You are also required to respond to **at least one** classmate's response each week. Make sure to exercise professionalism when responding to other student's online posts.Your initial posts in the discussion forum are due by ***midnight CST on Tuesday***.Your response posts are due by ***midnight CST on Saturday.***

Homework Assignments: Your each homework assignment consists of worksheets containing 5 problems for you to solve.

Quizzes: There are five quizzes throughout the course. Each quiz will contain ten multiple-choice questions. **Only one attempt is allowed.**

Course Project: The course project consists of five phases, with the final phase being due in module 5. The project is outlined in the Project Introduction in module 1 .

Final Exam: The final exam consists of **25** multiple-choice questions.

Live Classrooms : Please watch the archive of the live classroom session. **One question is built into the module for each live classroom session. Please submit your answer to receive your points.**

Homework assignments, Quizzes, course project and live classrooms are due every Sunday.

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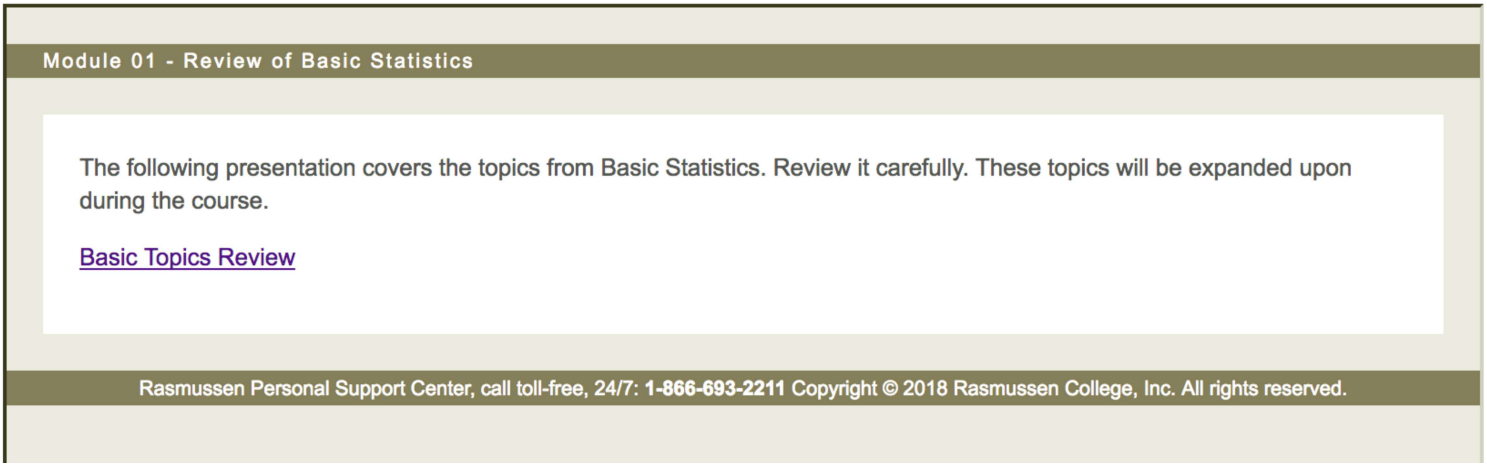
REVIEW OF TOPICS

Module 01-Review of Basic Statistics-> Lesson Content–>Review of Topics

Review of Topics



The presentation in Review of Topics of Module 1 covers the topics from Basic Statistics. Review it carefully. These topics will be expanded upon during the course.

BASIC STATISTICS REVIEW

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures.

Mean: The measure of center obtained by adding the values and dividing the total by the number of values. Also called average

Median: The middle value when the original data values are arranged in order of increasing (or decreasing) magnitude

Mode: The value that occurs with the greatest frequency

Midrange: The value midway between the maximum and minimum values in the original data set

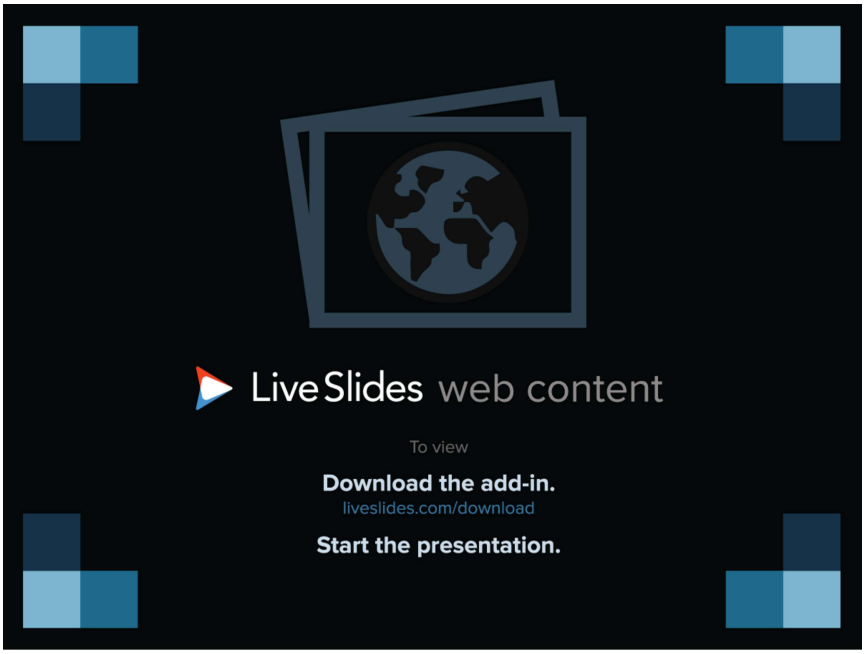
Range: The difference between the lowest and highest values.

Variance: The expectation of the squared deviation of a random variable from its mean,and it informally measures how far a set of (random) numbers are spread out from their mean.

Standard Deviation: A measure that is used to quantify the amount of variation or dispersion of a set of data values.

BASIC STATISTICS REVIEW

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures.



https://www.youtube.com/watch?v=Cx2tGUze60s

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QUIZ 1

Question 1

A multiple-choice question on a statistics quiz has possible correct answers of A, B, C, D and E. What is the probability that the correct answer is C?

Basic Rules for Computing Probability: Assume that a given procedure has *n* different simple events and that each of those simple events has an equal chance of occurring. If event *C* can occur in *s* of these *n* ways, then

$$P(C) = \frac{s}{n} = \frac{number\ of\ ways\ C\ can\ occur}{number\ of\ different\ simple\ events}$$

$$P(C) = \frac{1}{5}$$

QUIZ 1

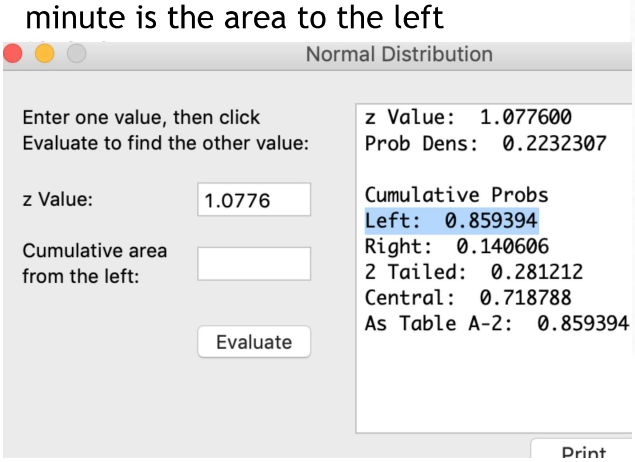
Question 2

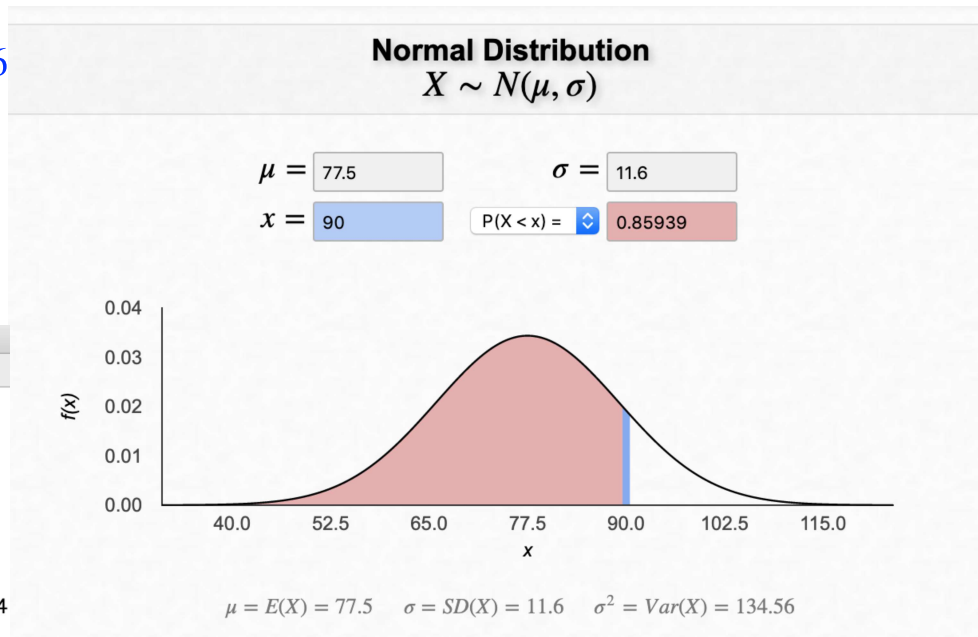
Women have pulse rates that are normally distributed with μ = 77.5 beats per minutes and σ = 11.6 beats per minutes. What is the probability that a randomly selected woman will have a mean pulse rate below 90 beats per minute?

We can convert to a z score and use Table A-2

$$z = \frac{x - \mu}{\sigma} = \frac{90 - 77.5}{11.6} = 1.0776$$

The probability that a randomly selected woman will have a mean pulse rate below 90 beats per minute is the area to the left





QUIZ 1

Question 3

The scores for two basketball teams are listed below:

Jets	67	87	54	99	78
Cats	85	90	44	80	46

What is the mean score for the Jets?

$$\frac{67 + 87 + 54 + 99 + 78}{5}$$

QUIZ 1

Question 4

The scores for two basketball teams are listed below:

Jets	67	87	54	99	78
Cats	85	90	44	80	46

Assume you are the head coach of the Cats basketball team and you are being interviewed by the local newspaper. Which measure of center would you report?

The **median** is generally considered to be the best representative of the central location of the data. The more skewed the distribution, the **greater** the difference between the **median** and **mean**, and the **greater** emphasis should be placed on using the **median** as opposed to the **mean**.

Question 5

The scores for two basketball teams are listed below:

Jets	67	87	54	99	78
Cats	85	90	44	80	46

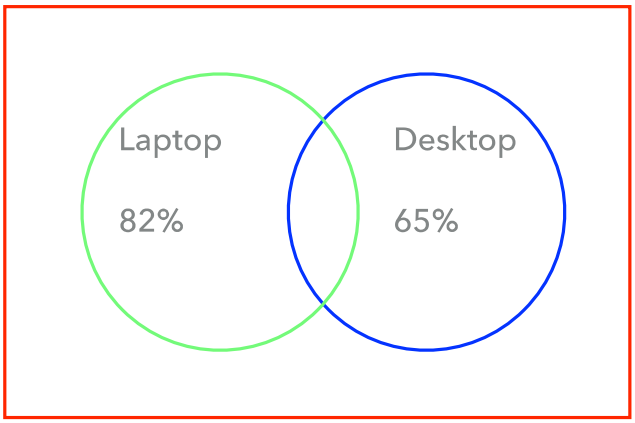
What is the median score for the Cats?

Arrange the values in order. The number of data values is odd, the median is the number located in the exact middle of the list.

44 46 80 85 90

QUIZ 1

Question 6
The probability that an online student owns a laptop is 0.82 and the probability that a student owns a desktop is 0.65. If the probability that a student owns both is 0.55, find the probability that a student owns a laptop or a desktop.



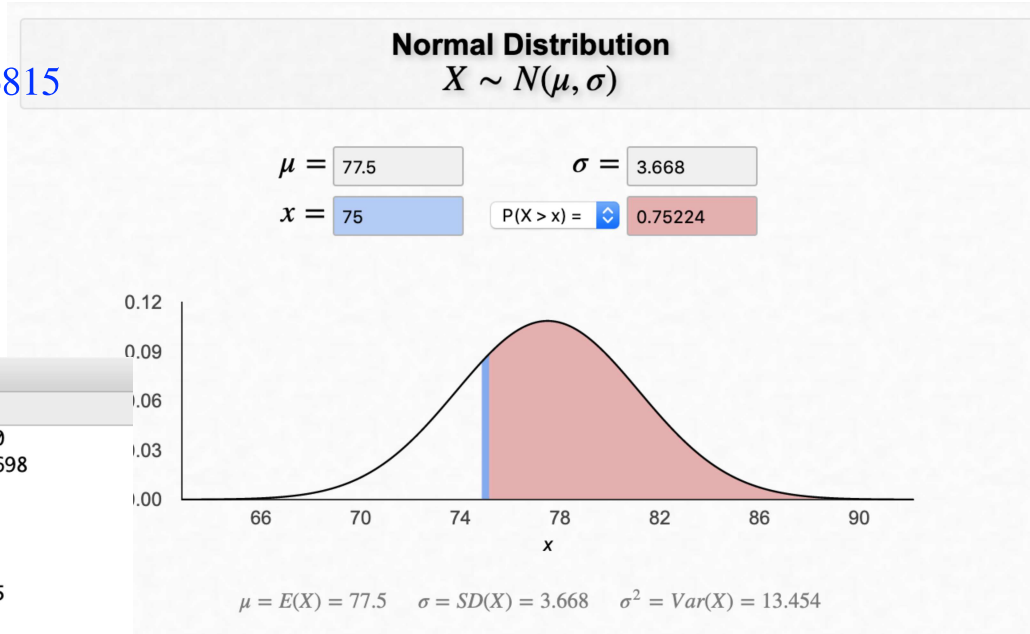
$$P(Laptop\ orDesktop) = P(Laptop) + P(Desktop) - P(Laptop\ and\ Desktop)$$
$$= 0.82 + 0.65 - 0.55$$

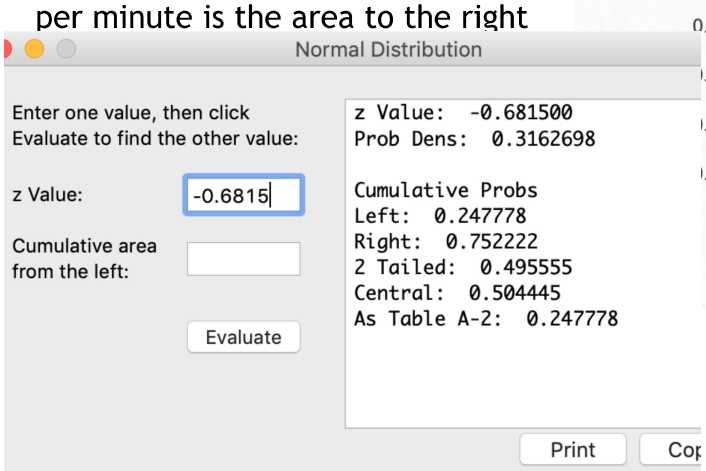
QUIZ 1

Question 7
Women have pulse rates that are normally distributed with μ = 77.5 beats per minutes and σ = 11.6 beats per minutes.
What is the probability that 10 randomly selected women will have a mean pulse rate greater than 75 beats per minute?

$$z = \frac{x-\mu}{\sigma/\sqrt{10}} = \frac{75-77.5}{11.6/\sqrt{10}} = -0.6815$$

The probability that a randomly selected woman will have a mean pulse rate greater than 75 beats per minute is the area to the right





QUIZ 1

Question8

The number of students registered for the statistics course represents what type of data?

- Discrete data: result when the number of possible values is either a finite number or a ‘countable’ number (i.e. 0 ,1,2,3…)

Question 9

An advertiser for a local newspaper made the comment: “The median price for homes in Mokena is the price that falls in the middle of all home prices in the area”. Is this statement correct? Choose the best answer.

The "median" is the "middle" value in the list of numbers. To find the median, your numbers have to be listed in numerical order from smallest to largest, so you may have to rewrite your list before you can find the median. The prices of the homes must be sorted and then the price in the middle represents the median price.

Question 10

An author collected sample data by randomly selecting 30 pages from a dictionary and then counted the number of defined words on each of the 30 pages. Which type of sampling method did the author use?

- A cluster sampling is that the population is divided into separate groups, called **clusters**.
- A random sampling occurs if a sample is drawn in such a way that each time an item is selected, each item has an equal chance of being drawn.
- Stratified sampling involves dividing the population by characteristics called stratifying factors such as gender, race, religion, or income.

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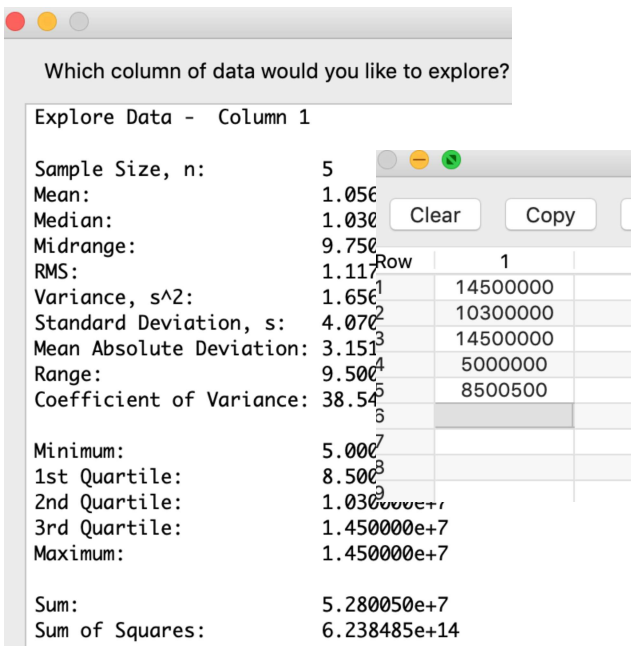
MODULE 1 HOMEWORK

Problem 1:
The following numbers below are the annual salaries for the starting lineup for a basketball team;
$14,500,000
$10,300,000
$14,500,000
$5,000,000
$8,500,500

Calculate the following statistics:
Mean
Median
Mode
Midrange
Range
Variance
Standard Deviation

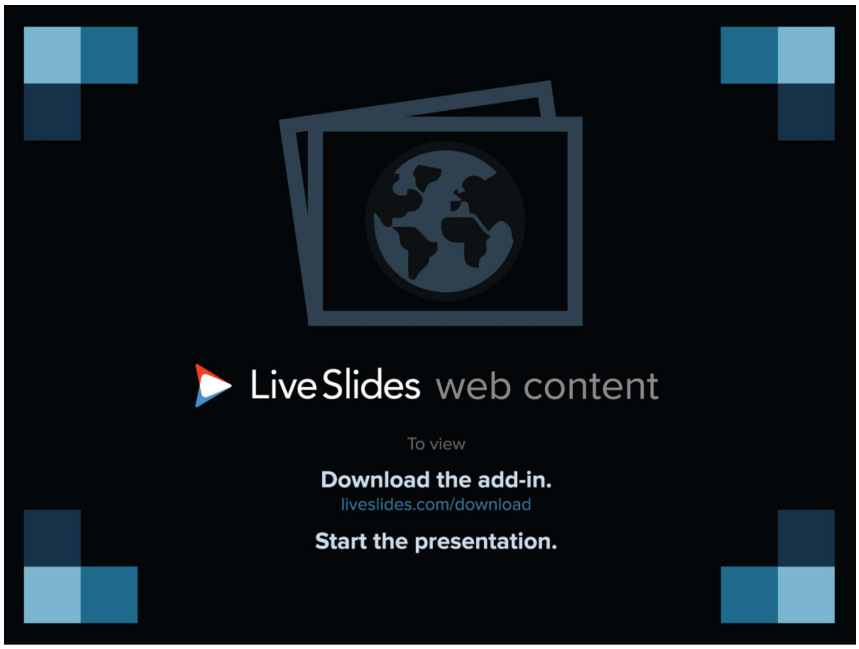
How to generate descriptive statistics summary in StatDisk?



For more information about how to use stat disk to find descriptive statistics, please check out

https://www.youtube.com/watch?v=Jza3XBwuHN4

How to generate descriptive statistics summary in Excel?



https://www.youtube.com/watch?time_continue=33&v=DPUm3J0Mn-k

Problem 4:
Assume you are given the following information from a bowl of M & M's. You randomly select one M & M from the bag.

Blue	**68**	**Dark Chocolate**	**27%**
Green	**74**	**Peanut Butter**	**33%**
Red	**26**	**Almonds**	**40%**
Brown	**53**		

a. Find the probability of getting a Brown M & M.
p=53/(68+74+26+53)

b. Find the probability of getting a Brown and Dark Chocolate M & M.
The number of Brown and Dark Chocolate M&M=53x27%=14
Total=68+74+26+53=221
The probability of getting a Brown and Dark Chocolate M &M is p=14/221

c. Find the probability of getting a Brown or Dark Chocolate M & M.
The number of Dark Chocolate M & M= 221x27%=60
The number of Brown M &M =53
The number of Brown **and** Dark Chocolate M&M=53x27%=14
The number of Brown **or** Dark Chocolate M&M=60+53-14
The probability of getting a Brown or Dark Chocolate M &M is p=(60+53-14)/221

Problem 5:
Weights of babies at the local community hospital have a distribution that is approximately normal with a mean weight of 7.43 pounds and a standard deviation of 1.25 pounds.A premature baby can be classified as being less than 5.51 pounds. Answer the following questions:

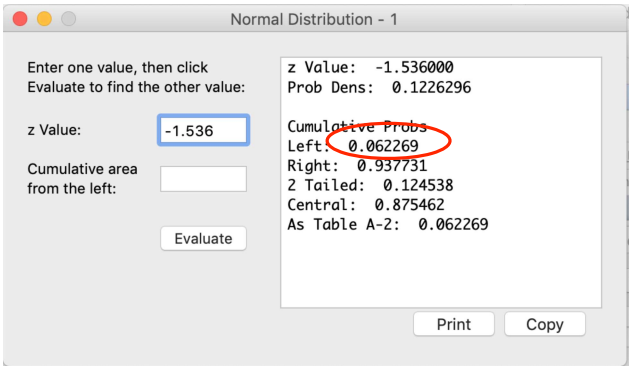
a. Find the probability of a randomly selected baby weighing less than 5.51 pounds. Round to two decimal places.

The mean $\mu = 7.43$ The standard deviation $\sigma = 1.25$
The z score

$$z = \frac{x - \mu}{\sigma} = \frac{5.51 - 7.43}{1.25} = -1.536$$

Please go to Statdisk-> Analysis->Probability Distribution -> Normal Distribution

The probability of a randomly selected baby weighing
less than 5.51 pounds is the area to the left



Problem 5:
Weights of babies at the local community hospital have a distribution that is approximately normal with a mean weight of 7.43 pounds and a standard deviation of 1.25 pounds.A premature baby can be classified as being less than 5.51 pounds. Answer the following questions:

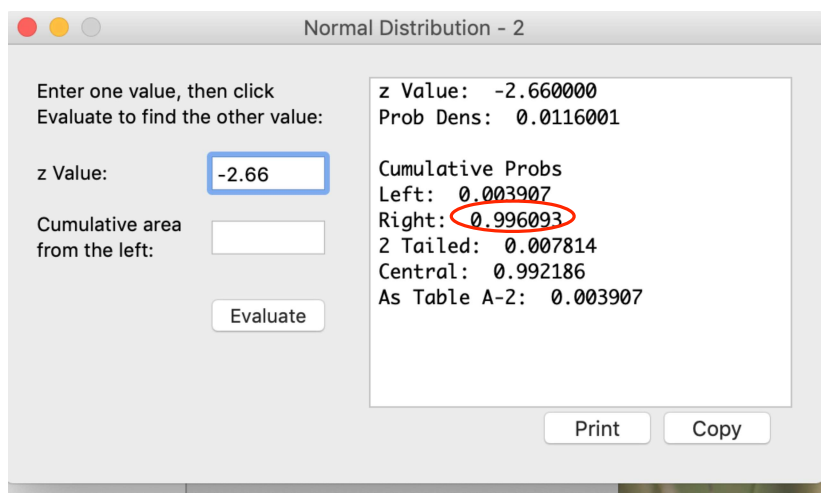
b. If 3 babies are randomly selected, what is the probability that their weight will be greater than 5.51 pounds?

The mean $\mu = 7.43$ The standard deviation $\sigma = 1.25$

The z score $z = \dfrac{x-\mu}{\sigma/\sqrt{n}} = \dfrac{5.51-7.43}{1.25/\sqrt{3}} = -2.66$

Please go to Statdisk-> Analysis->Probability Distribution -> Normal Distribution

The probability of a randomly selected baby weighing greater than 5.51 pounds is the area to the right.



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- Review each scenario and data set carefully and choose which scenario you would like to work with. Begin Phase 1 of your analysis by including the following information:

Course Project - Phase 1

You are provided with two options for your course project below. Select ONE of the options below for your analysis.

- Option 1 allows you to analyze job salaries for the state of Minnesota.

  Option 1 Scenario
  Option 1 Data Set

- Option 2 allows you to analyze the ages of infectious disease patients at NCLEX Memorial Hospital.

  Option 2 Scenario
  Option 2 Data Set

COURSE PROJECT PHASE 1

- Review each scenario and data set carefully and choose which scenario you would like to work with. Begin Phase 1 of your analysis by including the following information:
- 1. Introduce your scenario and data set.
- 2.Discuss the importance of the Measures of Center and the Measures of Variation.
- 3.Calculate the measures of center and measures of variation. Interpret your results in context of the selected topic.
- Mean
- Median
- Mode
- Midrange
- Range
- Variance
- Standard Deviation

<--- **Excel or Statdisk**

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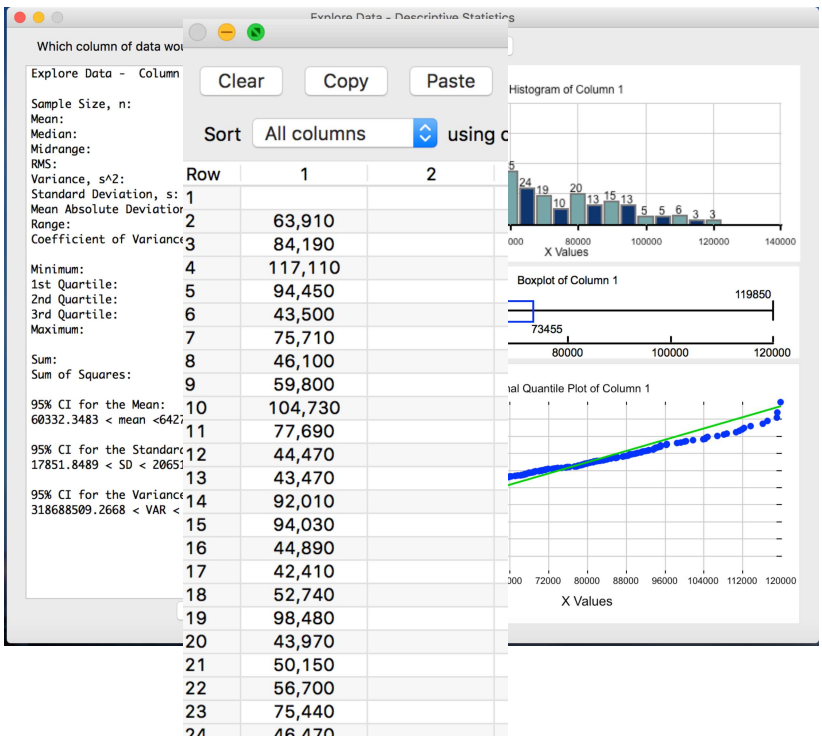

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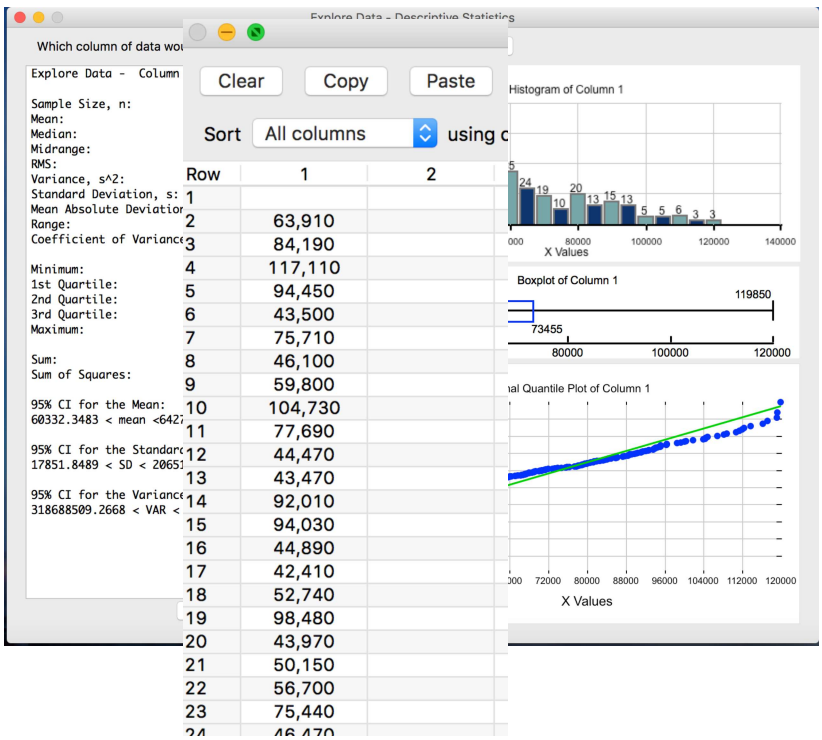
How to find MODE in StatDisk?



The mode of a data set is the number that occurs most frequently in the set.

To easily find the mode, you can use the MODE function in Excel and select the range you want to find the mode of.

In Statdisck, please go to "Data" and select "Sort Data". After you put the numbers in order from least to greatest and count how many times each number occurs. The number that occurs the most is the mode.

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WEEK 1 LIVE CLASSROOM GRADING

The live classroom session archive as a URL will be added after the session has ended.

The following is how you will receive your points for the week 1 live classroom session:

Question: **What is the name of our textbook?**

Please go to module 1 live classroom, enter your response to receive your points.

You have until midnight CST on Sunday to confirm that you have viewed the live classroom session archive.

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SUMMARY

- You can access your eTextbook for this course through the eTextbook link .
- Your initial post in the discussion forum should be due by midnight CST on Tuesday and You are also required to respond to at least one classmate's responses each week. Your response posts are due by midnight CST on Saturday.
- You will work on a series of weekly course projects which begin in Week 1 and end in Week 5. You will construct a final course project that is due in ***Week 5.***
- Homework assignments, Quizzes, course project and live classrooms are ***due every Sunday.***
- One question is built into the module for each live classroom session. Please submit the answer to receive your points.
- Week 1 Question: **What is the name of our textbook?**