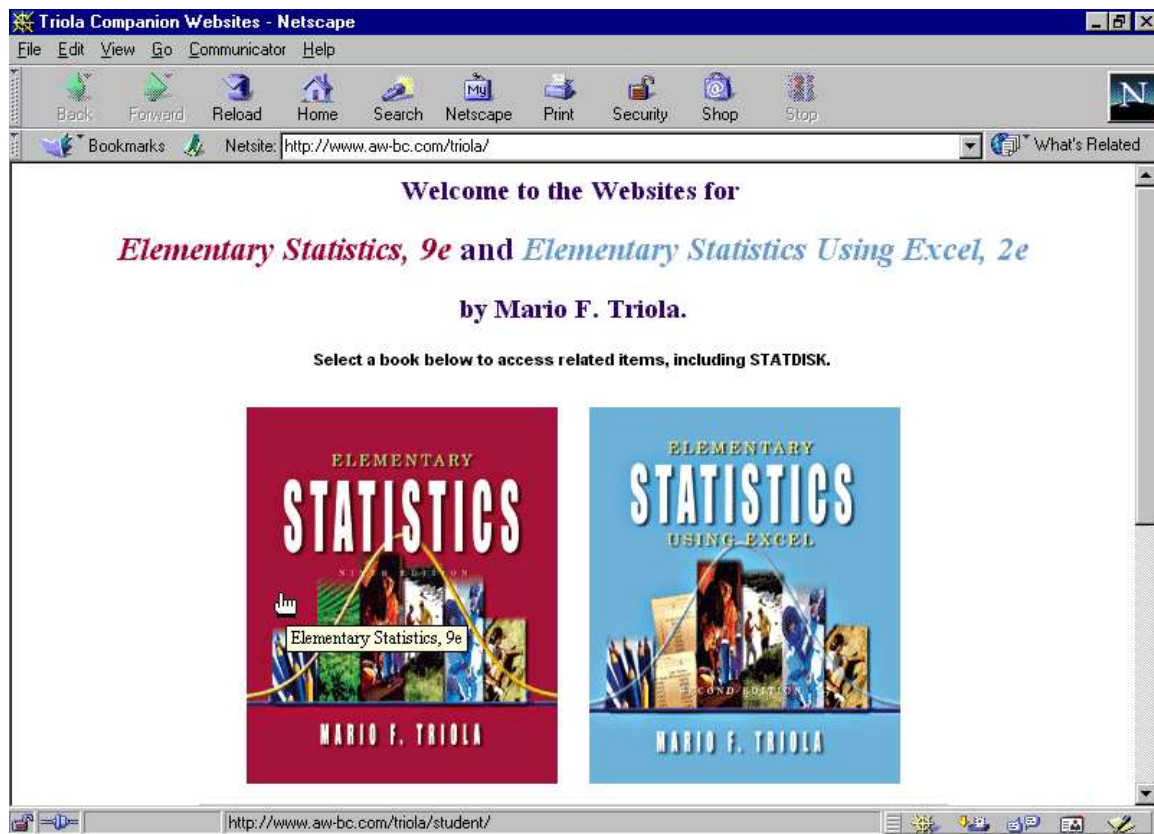
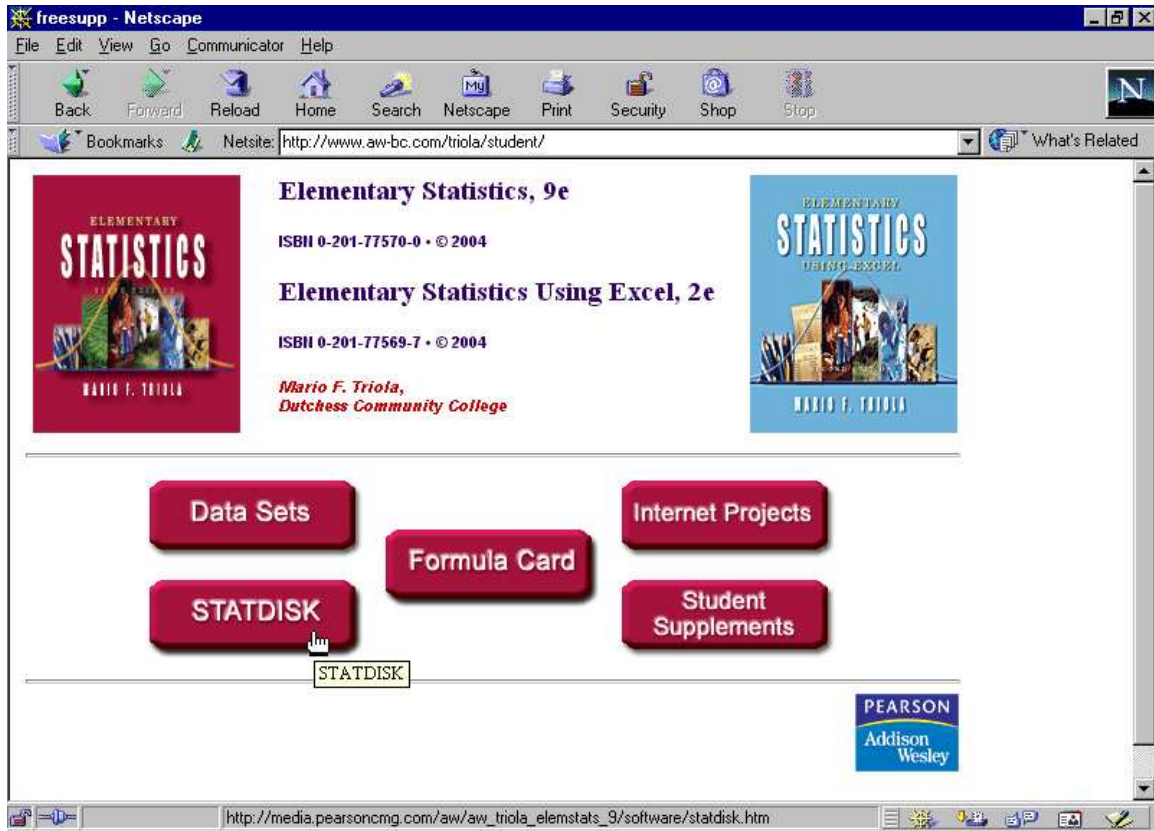


Downloading Statdisk version

Step 1: Log on to the Internet and open your browser. In the Location bar, type the URL **http://www.aw.com/triola** . You will be presented with the screen below.



Step 2: Click on the maroon picture of your text. You will be directed to the screen below.



Step 3: Click on the button that says Statdisk.



You will be presented with the screen below.



STATDISK

STATDISK is a software program designed specifically for *Elementary Statistics, 9th Edition* by Triola. It is referenced throughout the textbook, and can be used for nearly all of the statistical procedures in the book. All of the data sets from Appendix B are included in STATDISK, except for Data Set 4. The included data sets will be automatically available when the program is loaded.

Note: The following files are compressed for ease of download. Download a free version of [WinZip](#) (for Windows) or [Stuffit Expander](#) (for Mac) to extract the compressed files. Due to large file size, it may take several minutes to download this file. Please read the [ReadMe file](#) before downloading. A list of improvements to STATDISK 9.5 can be found in the [aboutstatdisk95.html](#) document.

The latest version of STATDISK is Version 9.5.1.

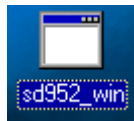
- [STATDISK 9.5.2 for Windows](#)
- [STATDISK 9.5.2 for Mac OS9](#)
- [STATDISK 9.5.2 for Mac OSX](#)

STATDISK is to be used only by users of the Triola textbooks.

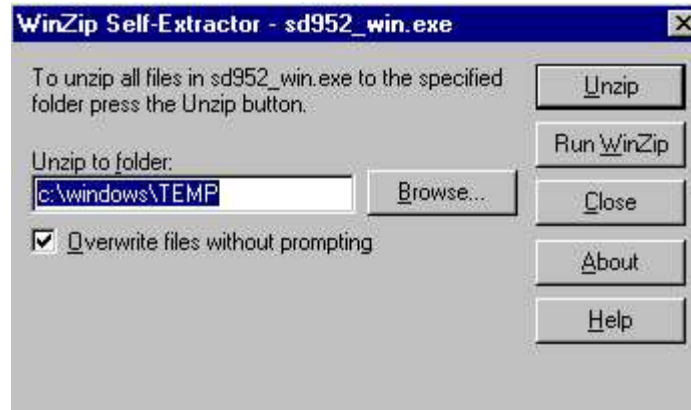
Updated 12/2003
An Addison-Wesley product. Copyright © 2004 Pearson Education, Inc.

Now I realize you cannot read the fine print, but there is two things you will need to do. If you do not have a package to unzip a file, then you will need to click on the link for WinZip (for Windows users) or Stuffit Expander (for Mac users). Both are free downloads.

Once you have done that, click on the version of Statdisk that corresponds to your machine. I have Windows, so I selected the first link. That presents you with a Save As dialog box. Choose where you want to save it and click OK. I choose to save it to the desktop, so the icon will be there when the download is complete. Even compressed, this is a huge file and takes a while to download. When you are done, you will notice the icon below on your desktop.



Step 4: Double click on the icon sd952_win. You will be prompted with the dialog box on the next page.

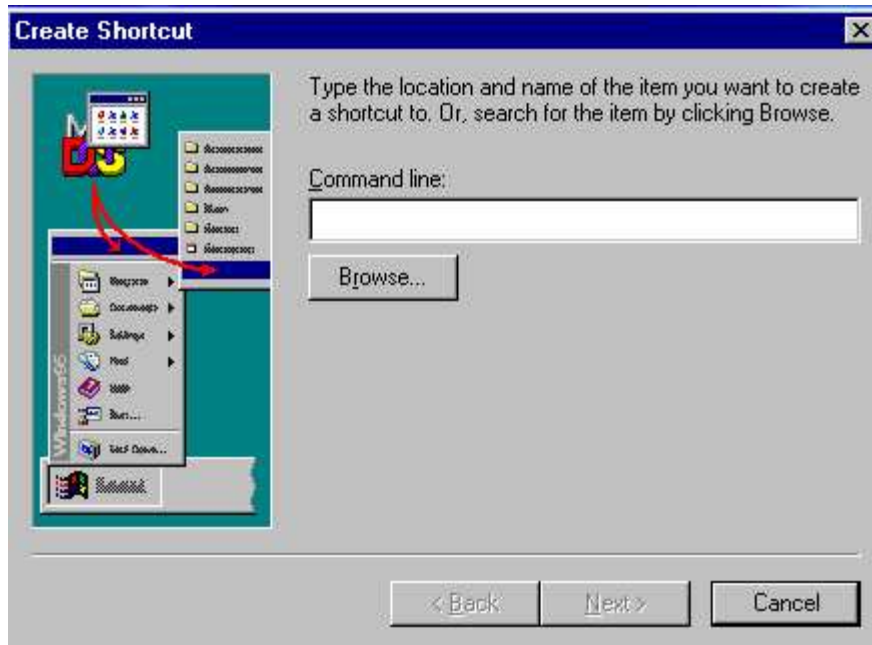


Select a folder to put Statdisk in, then hit select the Unzip button. In about a second, the file will be unzipped. Select the Close key to close the dialog box.

NOTE: You may want to create a separate folder for Statdisk. To do this, click on you're My Computer icon, then on the C: drive icon. Once you are in the C: box, RIGHT CLICK your mouse and select NEW then FOLDER. Name your folder something like Statdisk.

CREATING AN ICON for Statdisk.

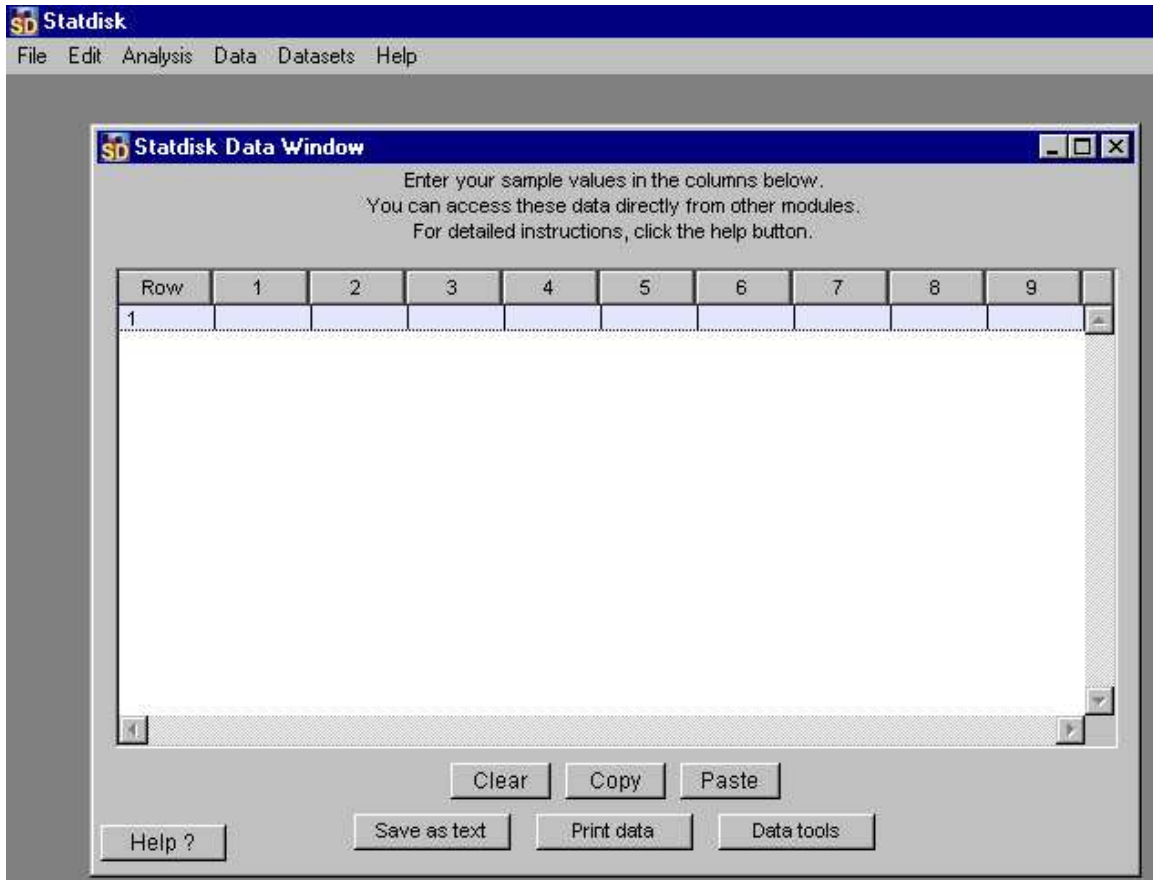
To make things easier on yourself, you may want to create an icon for your desktop. To do this, simply RIGHT CLICK your mouse and select NEW, then SHORTCUT. You will be presented with the dialog box on the next page. Select the Browse button to find your executable file. The file is inside the Statdisk folder then inside the STATDISK folder. (There are two different folders names Statdisk.) When you have found the file, select the Next key.



Name your shortcut and select the Finish key. You will now have an icon on your desktop.

Section 2.3 - Histograms

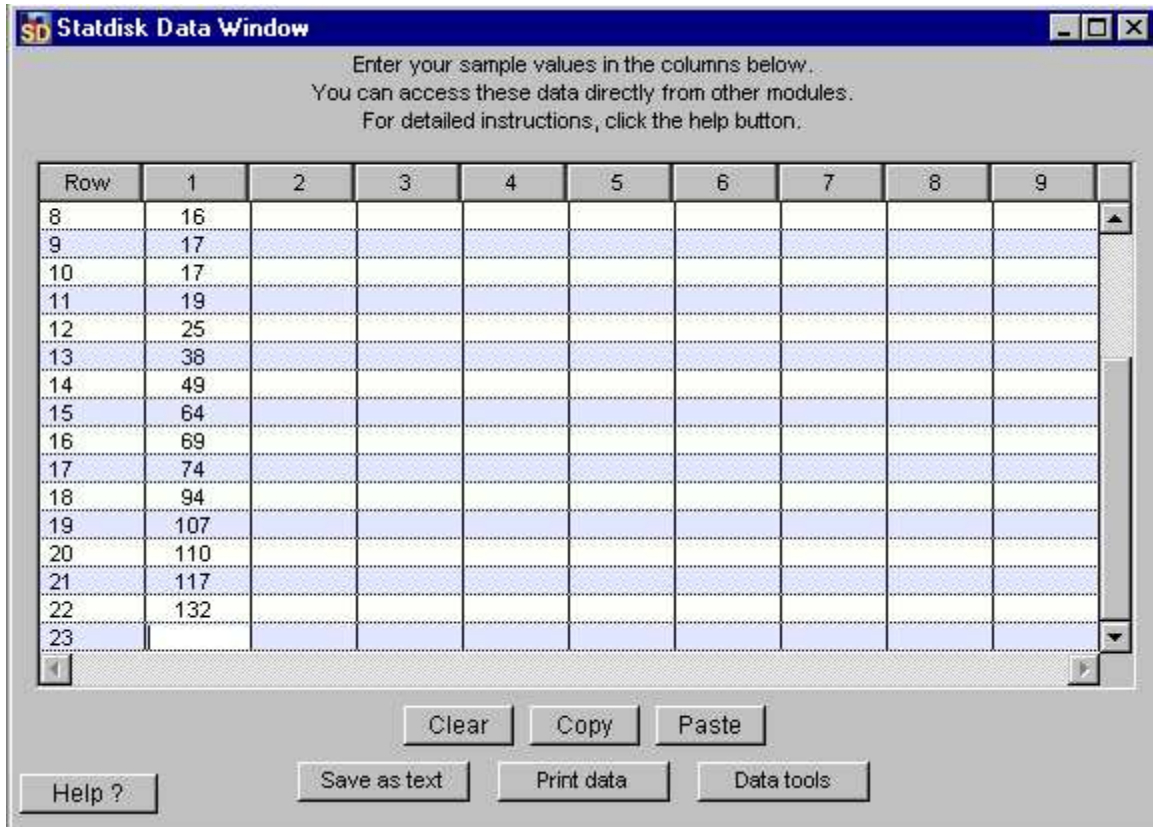
When you initially open Statdisk, you will be presented with the screen below.



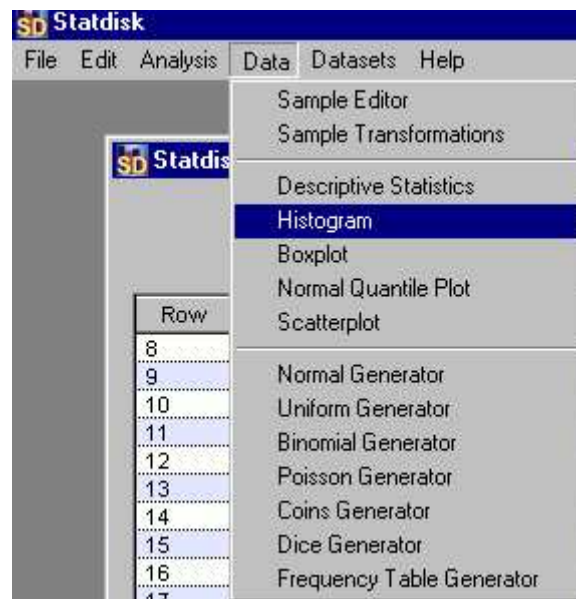
EXAMPLE: Use Statdisk to create a histogram for the number of runs scored by the 1996 Baltimore Orioles. The data set is below.

3, 4, 5, 6, 6, 9, 14, 16, 17, 17, 19, 25, 38, 49, 64, 69, 74, 94, 107, 110, 117, 132.

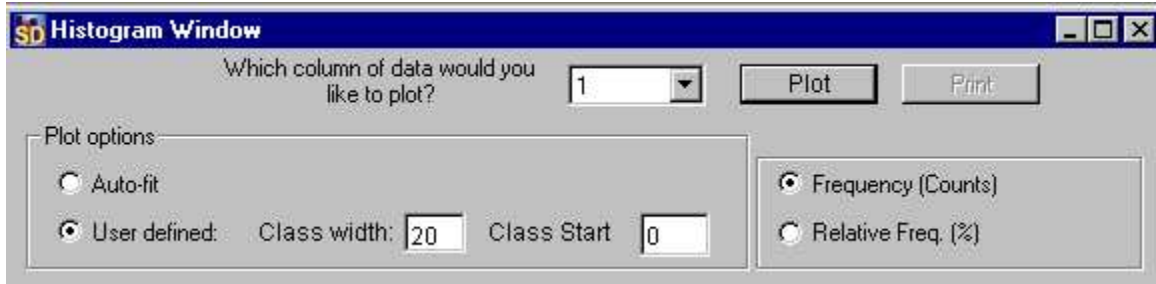
Your first step is to enter the data into the first column of the spreadsheet. This will look a lot like an Excel spreadsheet. When you have entered your data in the first column, your screen should look like the image on the next page.



Now to create the histogram, from the menu bar, select DATA >> HISTOGRAM. Your screen will look like the one below.

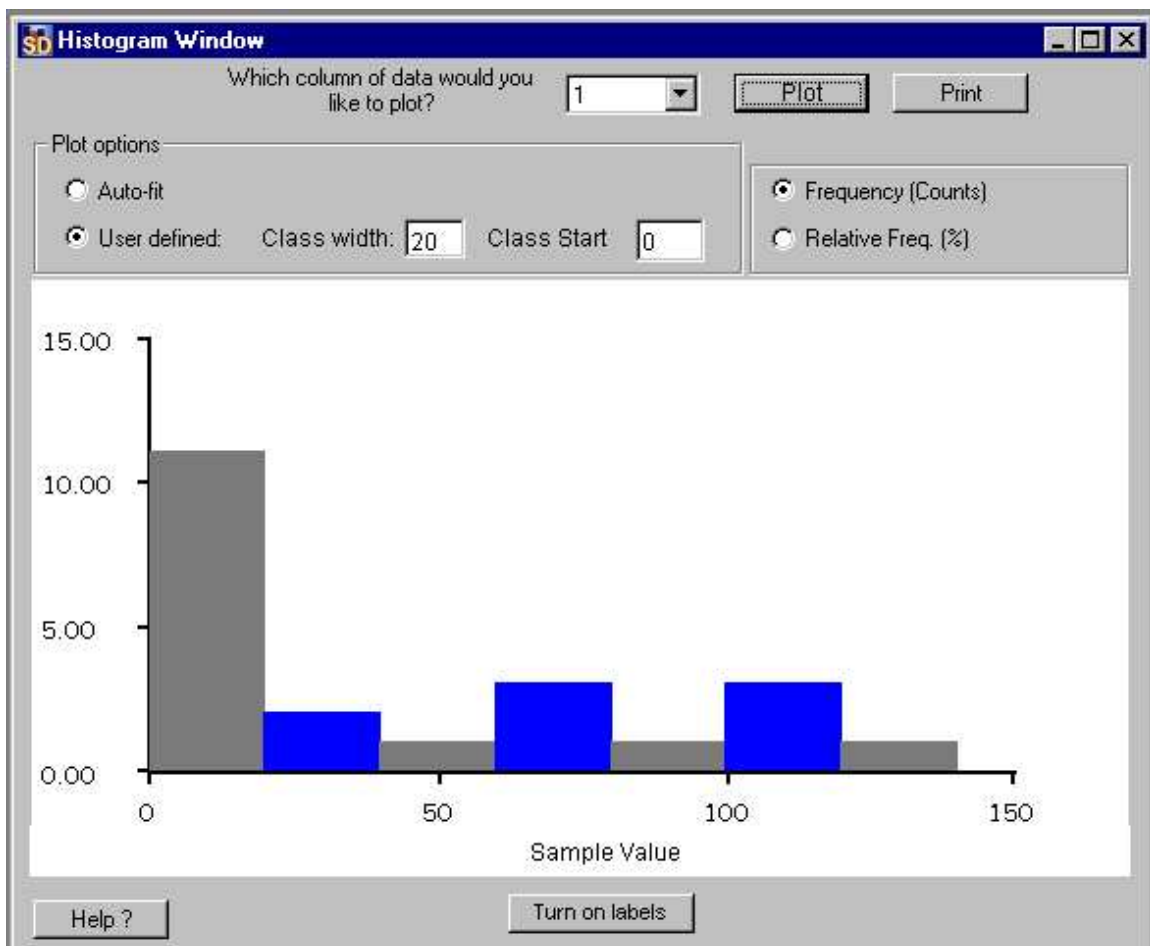


You will be presented with a screen similar to the one below.

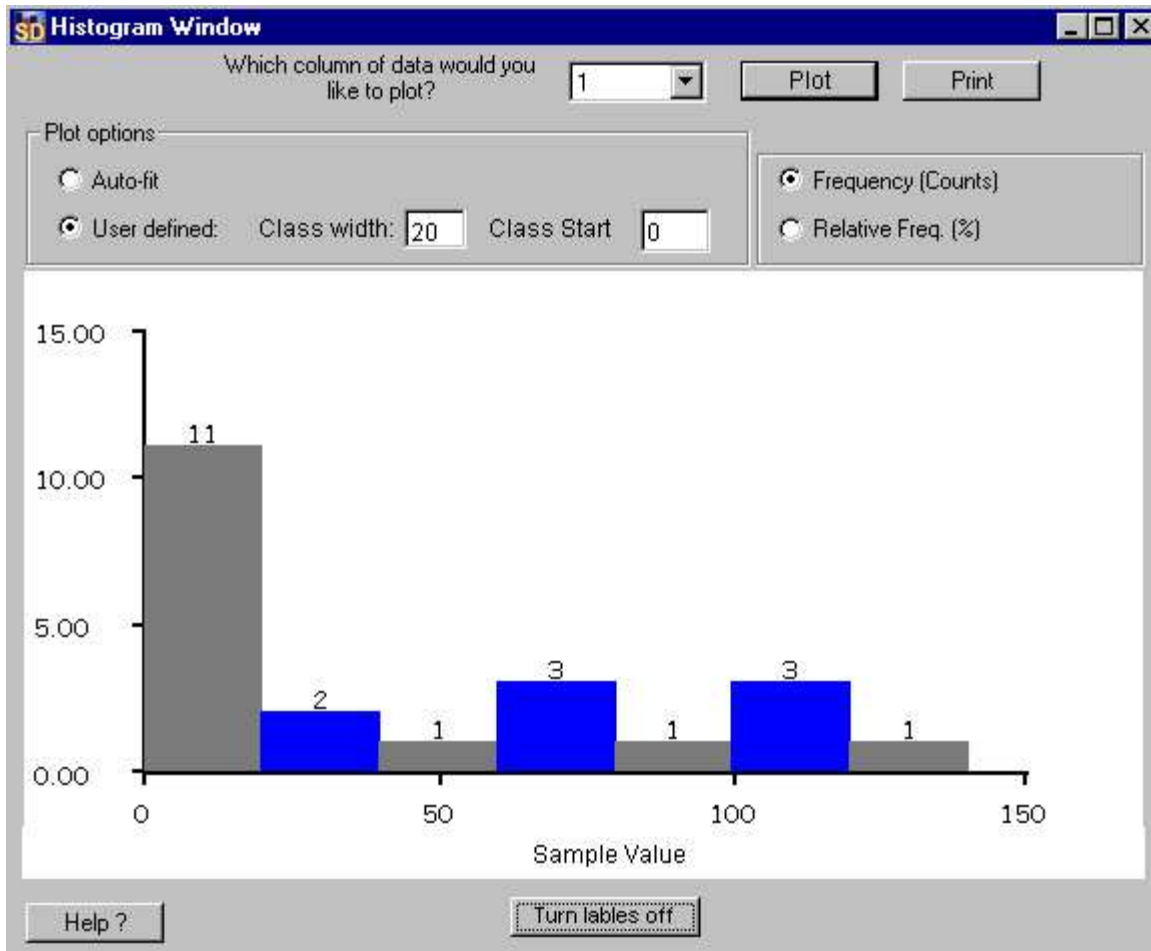


Under Plot Options, select User Defined. Enter the class width that you determined when you created your frequency table. When you are done, click on the Plot button.

You will be presented with the screen below.



if you click the Turn on labels button, you will get counts above the bars. See the figure on the next page.



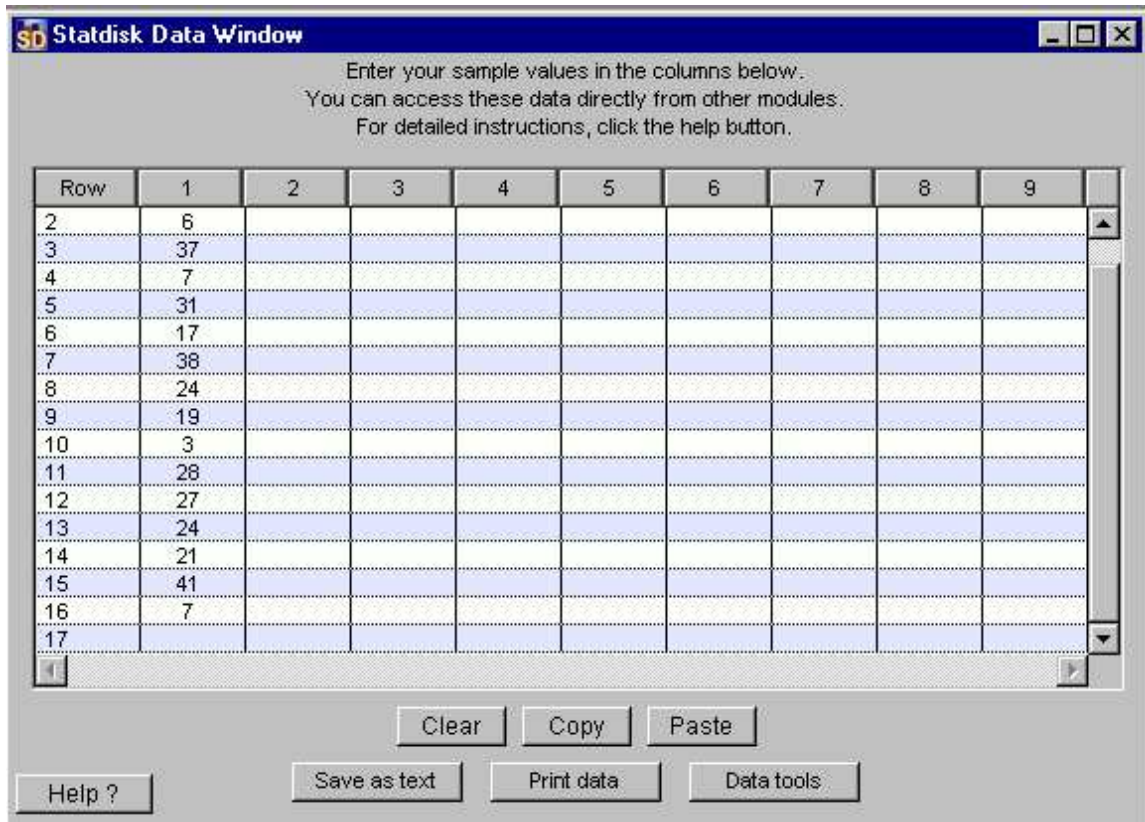
NOTE: If you can't get the PRINT button to work in Statdisk 9.5.2, just use your Print Screen button ON YOUR KEYBOARD to save the image to the clipboard. Then open Word and paste the image into Word. You can then print out the Word document.

Section 2.4 & 2.5 – Descriptive Statistics

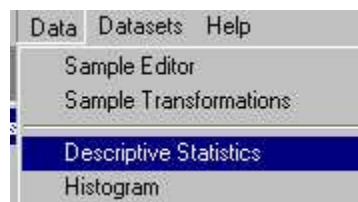
EXAMPLE: Use Statdisk to determine the mean, median, midrange, variance and standard deviation for the football scores listed below.

13, 6, 37, 7, 31, 17, 38, 24, 19, 3, 28, 27, 24, 21, 41, 7.

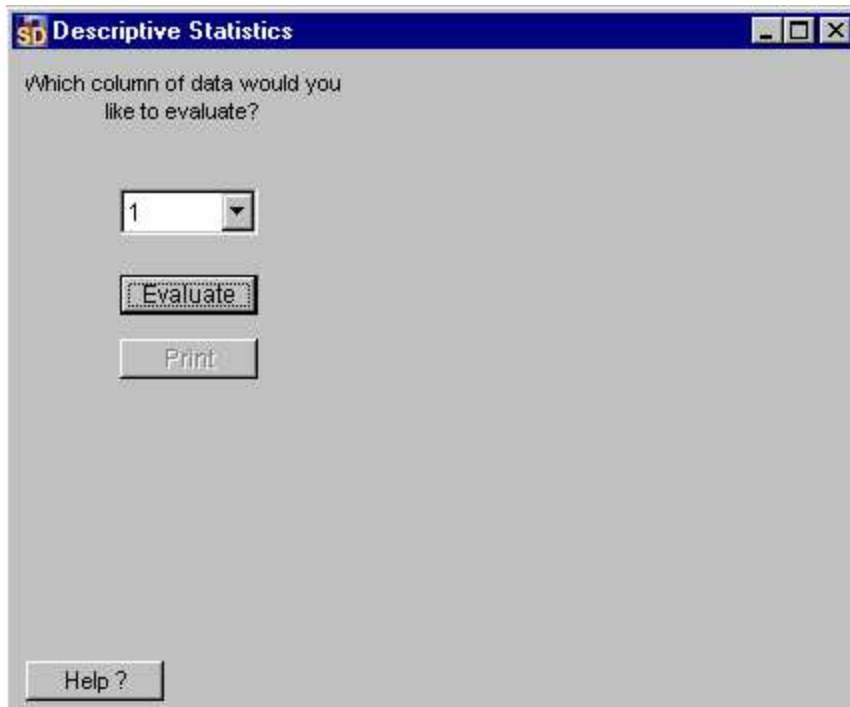
First, enter the data in column 1.



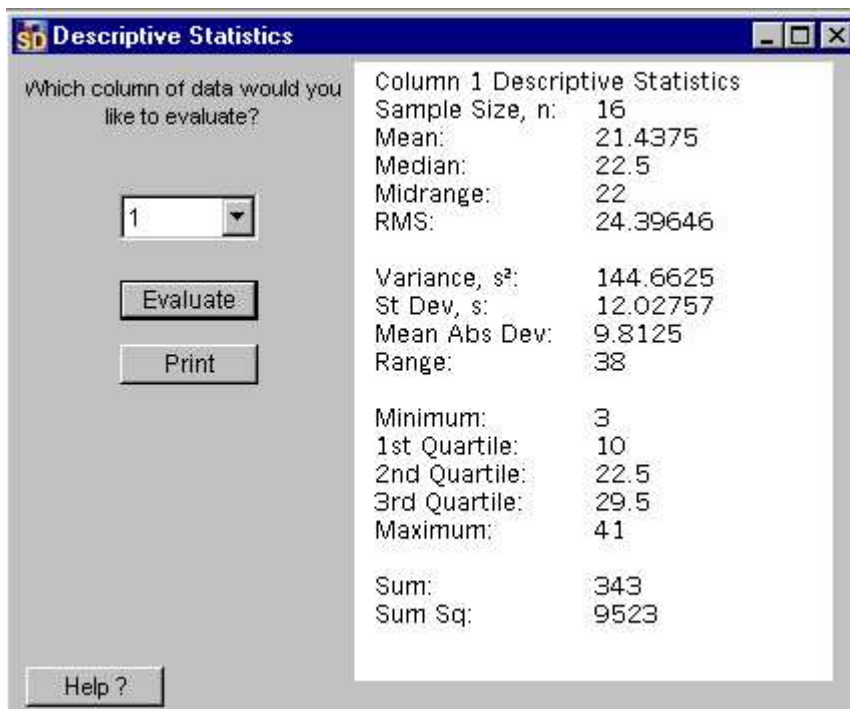
Next, from the menu bar, select DATA >> DESCRIPTIVE STATISTICS



You will be presented with the screen below.



Right click on the Evaluate button. You will be presented with the screen below.



Notice that Statdisk does not give you the mode. What is the mode for this data set?

NOTE: If you can't get the PRINT button to work in Statdisk 9.5.2, just use your Print Screen button to save the image to the clipboard. Then open Word and paste the image into Word. You can then print out the Word document.

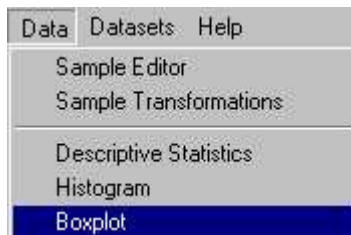
Section 2.7 - Boxplots

EXAMPLE: Use Statdisk to create a boxplot for the number of doubles scored by the 1996 Baltimore Orioles. The data set is below.

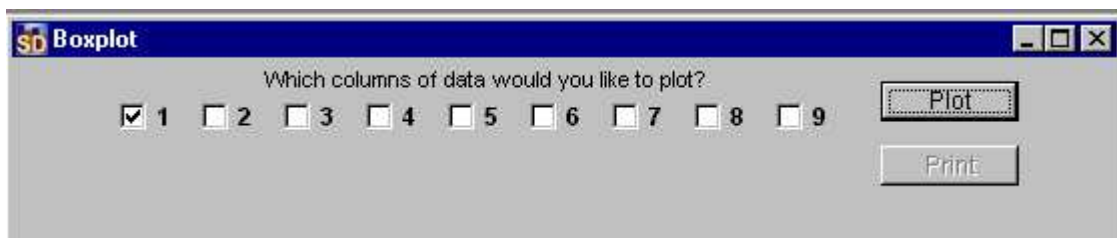
0, 0, 1, 2, 2, 2, 3, 4, 7, 8, 8, 8, 10, 11, 13, 21, 27, 27, 37, 40, 40, 43.

Enter the data in the first column of the spreadsheet

Next, from the menu bar, select DATA >> BOXPLOT.

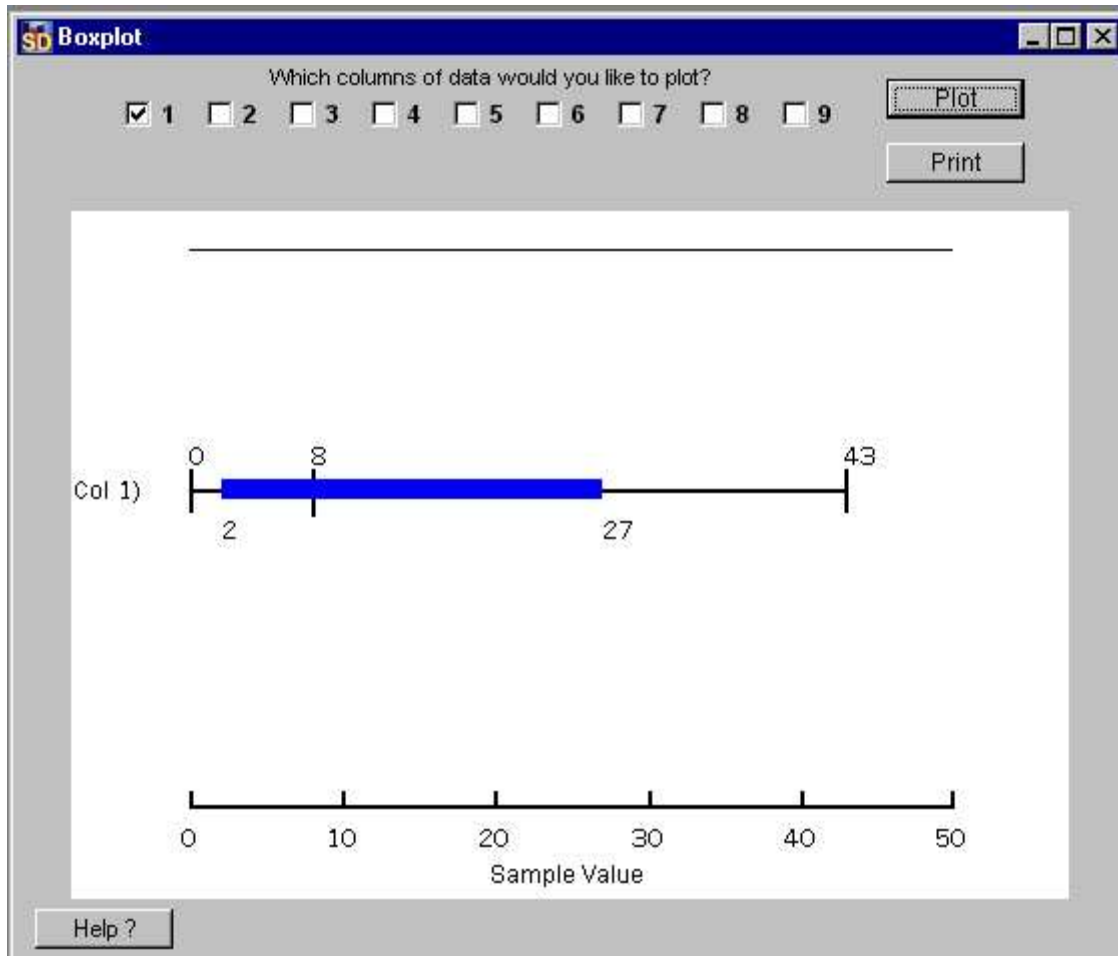


You will be presented with the screen below.



Since all of our data is in column 1, the default column, right click the Plot button. The boxplot of the number of doubles hit by the 1996 Baltimore Orioles is below.

NOTE: If you were comparing data in column 1 and column, you would make sure the box to the left of both 1 and 2 had a check mark in it.



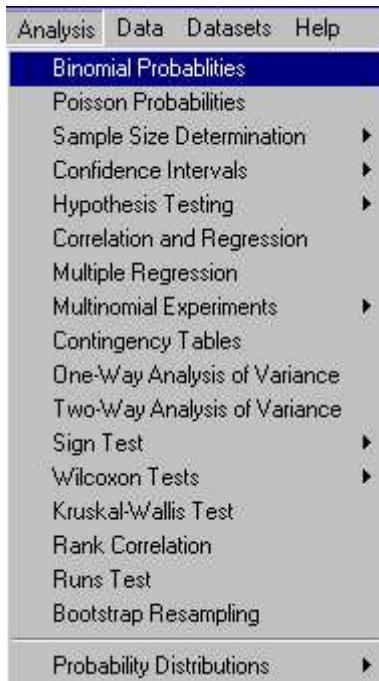
What do the numbers 0.00, 2.00, 8.00, 27.00 and 43.00 represent?

NOTE: If you can't get the PRINT button to work in Statdisk 9.5.2, just use your Print Screen button to save the image to the clipboard. Then open Word and paste the image into Word. You can then print out the Word document.

Section 4.3 – 4.4 – Binomial Distributions

EXAMPLE 1: 10% of the population is left-handed. In a class of 20 people, what is the probability that exactly 2 people are left-handed?

From the menu bar, select ANALYSIS >> BINOMIAL PROBABILITIES



You will be presented with the screen below.

Binomial Probability

Num Trials, n: Evaluate

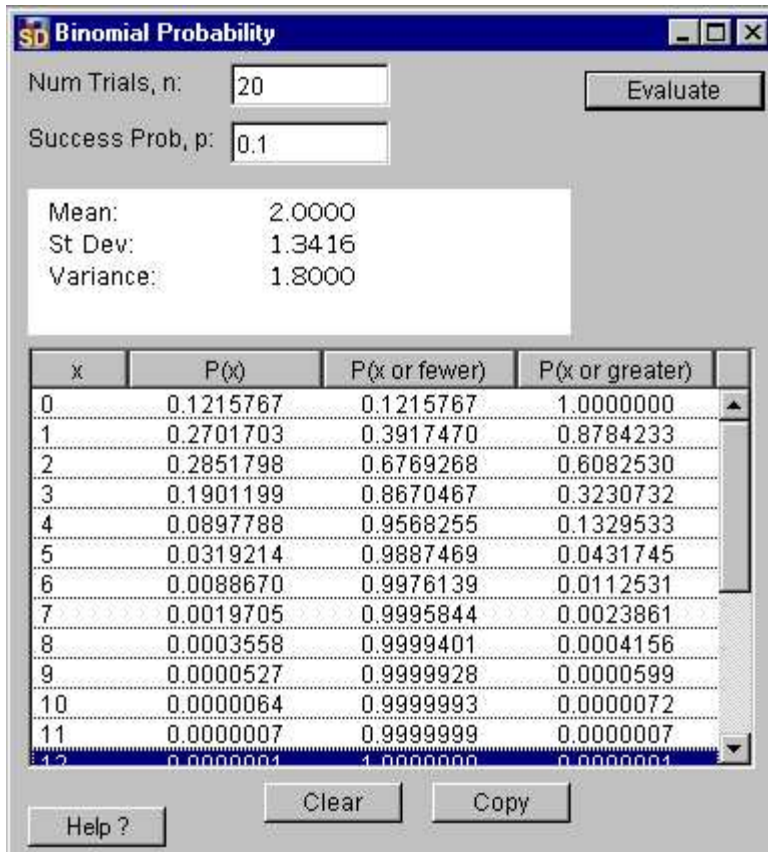
Success Prob, p:

x	P(x)	P(x or fewer)	P(x or greater)
---	------	---------------	-----------------

Help? Clear Copy

Enter the value of n (in this example 20) in the box labeled Num Trials, n :. Enter the probability of success, p , in the corresponding box.

Click on the box labeled EVALUATE. You should be presented with the screen on the next page.



Statdisk gave us more information than what we asked for. Let's examine the table more closely.

The first column list the number of "success", x . Since n equals 20, x can be any integer from 0 to 20 inclusive. Depending on the sample size, you may need to use the scroll bar to see all of the data. Why must x be an integer? See the last page of this section for the answer.

The second column gives us the number of success out of the $n = 20$ trials. Looking at the data in the second column, we can see that $P(x = 2)$ is 0.28518 or 0.285 or 25.8% when rounded correctly.

EXAMPLE 2: 10% of the population is left-handed. In a class of 20 people, what is the probability that at most 2 people are left-handed?

The third column gives us the probability of "at most" x successes out of n trials. Therefore, the probability of "at most 2 left handed students." Translates to $P(x \leq 2) = 0.67693$ or 67.7% when rounded correctly.

EXAMPLE 3: 10% of the population is left-handed. In a class of 20 people, what is the probability that less than 2 people are left-handed?

The probability of “less than 2 students are left handed”, requires you to remember that $P(x < 2)$ is the same as $P(x \leq 1)$ (since this is a discrete random variable). Therefore $P(x < 2) = 0.39175$ or 39.2%.

EXAMPLE 4: 10% of the population is left-handed. In a class of 20 people, what is the probability that at least 2 people are left-handed?

The last column gives us the probability of “at least” x success out of n trials. Therefore the probability of “at least” 2 left handed students” translates to $P(x \geq 2) = 0.60825$ or 60.8%.

EXAMPLE 5: 10% of the population is left-handed. In a class of 20 people, what is the probability that more than 2 people are left-handed?

You need to remember that $P(x > 2)$ is the same as $P(x \geq 3)$ when working with a discrete random variable. Therefore, looking at the chart, we see that $P(x > 2) = P(x \geq 3) = 0.32307$ or 32.3%.

EXAMPLE 6: In a room with 20 people, what is the mean, variance and standard deviation of the number of people that are left handed?

NOTE: If you can't get the PRINT button to work in Statdisk 9.5.2, just use your Print Screen button to save the image to the clipboard. Then open Word and paste the image into Word. You can then print out the Word document.

The box above the probabilities gives us the mean, variance and standard deviation when $n = 20$ and $p = 0.1$. The output tells us that the mean is 2, the variance is 1.8 and the standard deviation is 1.34. Using the formula to verify these results, we have

$$\mu = np = 20 * 0.1 = 2.0$$

$$\sigma^2 = npq = 20 * .01 * .90 = 1.80$$

$$\sigma = \sqrt{npq} = \sqrt{20 * .01 * .90} = 1.34$$

PRACTICE: The probability of a selecting a red sweater from the Lord and Bloomie's catalog is 30.5%. In a room filled with 12 people, use the table below to answer the following questions:

x	P(x)	P(x or fewer)	P(x or greater)
0	0.0127004	0.0127004	1.0000000
1	0.0668827	0.0795831	0.9872996
2	0.1614328	0.2410159	0.9204169
3	0.2361486	0.4771645	0.7589841
4	0.2331755	0.7103401	0.5228355
5	0.1637261	0.8740662	0.2896599
6	0.0838262	0.9578924	0.1259338
7	0.0315318	0.9894242	0.0421076
8	0.0086485	0.9980727	0.0105758
9	0.0016868	0.9997596	0.0019273
10	0.0002221	0.9999816	0.0002404
11	0.0000177	0.9999994	0.0000184
12	0.0000006	1.0000000	0.0000006

- A] P(x is exactly 6), that is, P(x = 6)
- B] P(x is exactly 4), that is, P(x = 4)
- C] P(x is at least 3), that is, P(x ≥ 3)
- D] P(x is at least 1), that is, P(x ≥ 1)
- E] P(x is more than 2), that is, P(x > 2)

F] $P(x \text{ is more than } 7)$, that is, $P(x > 7)$

G] $P(x \text{ is at most } 5)$, that is, $P(x \leq 5)$

H] $P(x \text{ is at most } 7)$, that is, $P(x \leq 7)$

I] $P(x \text{ is less than } 7)$, that is, $P(x < 7)$

J] $P(x \text{ is less than } 10)$, that is, $P(x < 10)$

ANSWERS

A] 8.38% B] 23.3% C] 75.9% D] 98.7% E] 75.9% F] 1.06%

G] 87.4% H] 98.9% I] 95.8% J] 99.9%

When working with a binomial distribution, why must x be an integer?

ANSWER: Because x represents the “*number*” of successes and you can’t have a partial success when working with a discrete (countable) random variable.

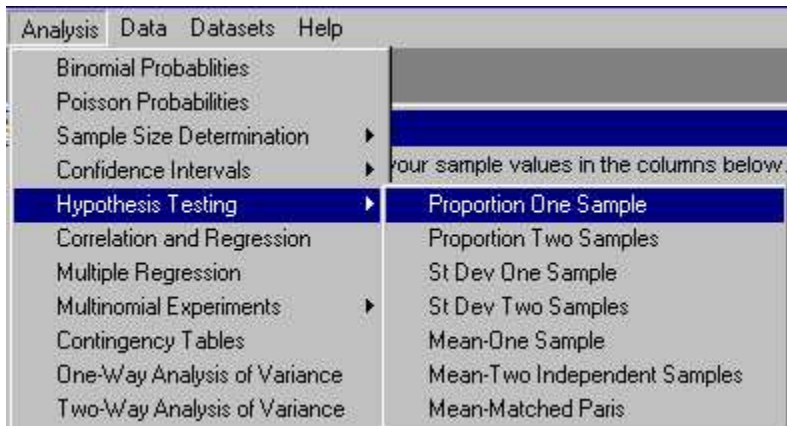
Chapters 6 & 7 Confidence Intervals and Hypothesis Testing

All confidence interval and hypothesis test for proportions or normal distributions can be found under ANALYSIS >> HYPOTHESIS TESTING.

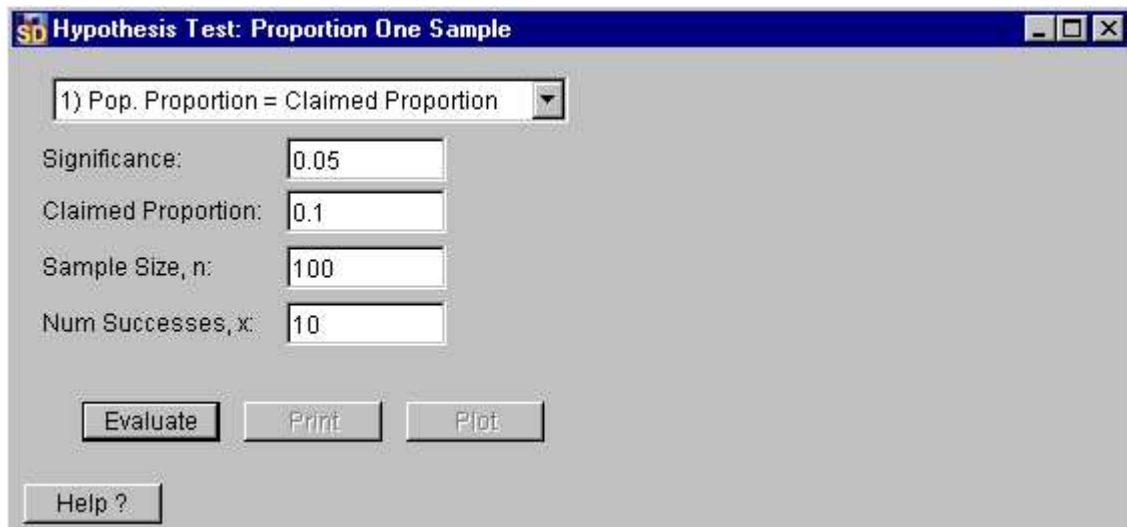
TEXT SECTION 6.2

EXAMPLE: A pack of M&M's contained 46 M&M's, 24 of which are brown. M&M Mars company claims that 30% of all plain M&M's are brown. Construct a 99% confidence interval for the true proportion of brown M&M's.

From the menu bar, select ANALYSIS >> Hypothesis Testing >> The type of data you are working with. For this example, we are dealing with a one sample proportion.



You will have a dialog box like the one on the next page.



Right now, you can leave the top box alone.

Since we want a 99% confidence interval, our significance level is .01. The claimed population proportion 30% or .3. The sample size is 46 and the number of successes is 24. Filling in the appropriate boxes and click on the EVALUATE button, we have

Therefore we can say, with 99% confidence, that the true proportion of brown M&M's in a pack is between .33 and .71 (or between 33% and 71%).

NOTE: Although calculating a confidence interval by hand or using your TI does not require the population proportion be known, Statdisk does.

TEXT SECTION 7.3

EXAMPLE: A pack of M&M's contained 46 M&M's, 24 of which are brown. M&M Mars company claims that 30% of all plain M&M's are brown. At the 0.05 level of significance, test the companies claim.

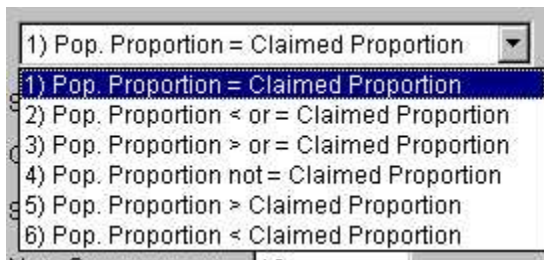
First, we need to decide what kind of test is to be done and then determine the null and alternative hypothesis.

$$H_0 : p = .30$$

$$H_1 : p \neq .30$$

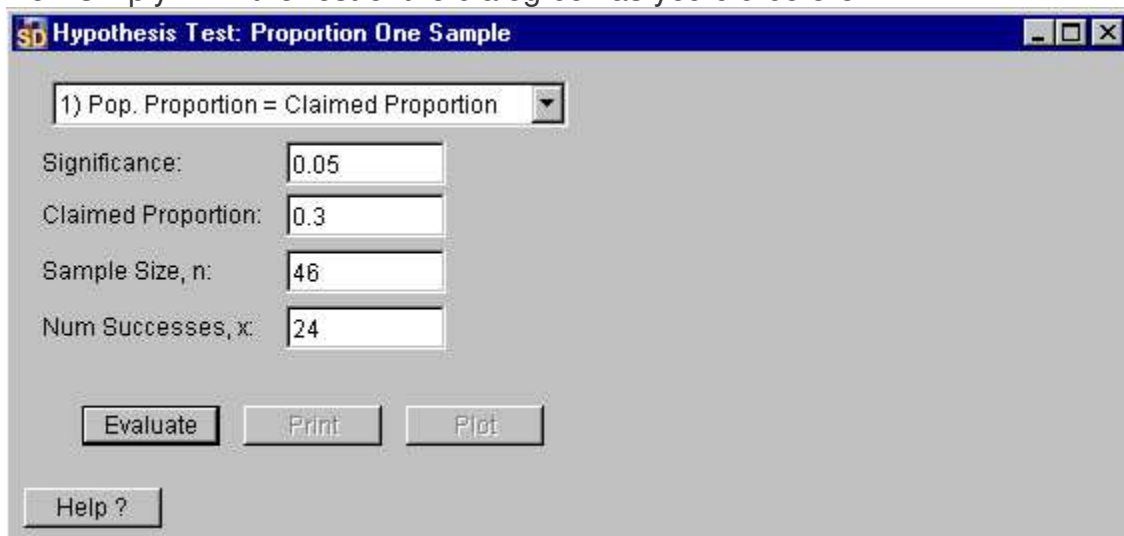
If you enter the data correctly, Statdisk will literally do everything, including your conclusion, for you. However, you will NOT be allowed to use Statdisk on any exams.

From the menu bar, select Analysis >> Normal Distribution >> Proportion One Sample. You will be presented with the same dialog box in the previous section of these notes. The only difference will be in the first box. Here is where you decide what type of hypothesis test is being conducted.

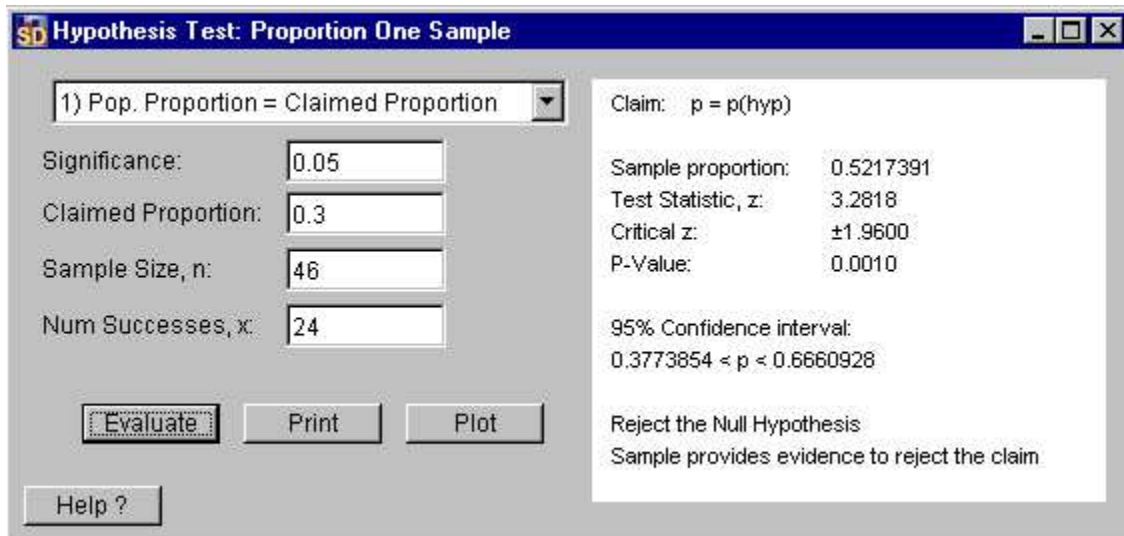


Since the claim is that the proportion of plain brown M&M's is 30%, and it means equals in mathematics, we want choice 1, "Pop. Proportion = Claimed Proportion".

Now simply fill in the rest of the dialog box as you did before.



Click on the Evaluate button and you will have the screen on the next page.

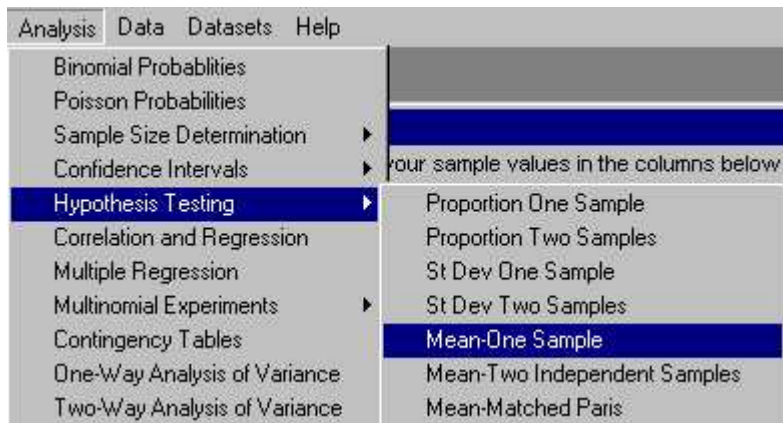


Since your test statistic is larger than your critical value, or your p-value is smaller than alpha, you Reject H_0 . Even your conclusion is provided. The sample evidence provides evidence to reject the M&M Mars companies claim that 30% of all plain M&M's are brown.

TEXT SECTION 6.3

EXAMPLE: The Fluffy Lump is a cat toy company that sells catnip by the pound. Although the boxes are advertised at 16 oz., a random sample of 50 boxes yielded a mean of 16.2 oz. and the assumed population standard deviation of 0.04 oz. Construct a 95% confidence interval for the population mean weight of boxes of catnip.

From the menu bar, select ANALYSIS >> HYPOTHESIS TESTING >> MEAN ONE SAMPLE



You will be presented with the dialog box on the next page.

SD Hypothesis Testing: One Mean

1) Pop. Mean = Claimed Mean

Significance: 0.05

Claimed Mean: 100

Population St Dev:
(if known)

Sample Size, n: 100

Sample Mean: 100

Sample St Dev, s: 10

Evaluate Plot

Help ? Print

For any confidence interval question, we will leave the first box as Pop. Mean = Claimed Mean. Again, that involves the hypothesis test which we will cover in chapter 7.

For our example, we have a significance level of 0.05, a population mean believed to be 16, a sample mean of 16.2 and a population standard deviation of 0.04. Filling in the dialog box, we have

SD Hypothesis Testing: One Mean

1) Pop. Mean = Claimed Mean

Significance:

Claimed Mean:

Population St Dev: (if known)

Sample Size, n:

Sample Mean:

Sample St Dev, s:

Notice that the sample standard deviation is left empty. That is because we know sigma in this example. Click on the Evaluate button and you have the screen below.

SD Hypothesis Testing: One Mean

1) Pop. Mean = Claimed Mean

Significance:

Claimed Mean:

Population St Dev: (if known)

Sample Size, n:

Sample Mean:

Sample St Dev, s:

Claim: $\mu = \mu(\text{hyp})$

z Test

Test Statistic, z:	35.3553
Critical z:	± 1.9600
P-Value:	0.0000

95% Confidence interval:
 $16.18891 < \mu < 16.21109$

Reject the Null Hypothesis

Sample provides evidence to reject the claim

We can say with 95% confidence, that the populations mean weight of boxes of catnip sold by Fluffy Lump is between 16.189 ounces and 16.211 ounces.

TEXT SECTION 7.4

EXAMPLE: The Fizzy Pop Soda Company produces 2 liter bottles of soda. A random sample of 40 bottles yielded a mean of 1.95 liters and an assumed population standard deviation of 0.2 liters. At the 0.01 level of significance, test the company's claim that their soda bottles contain 2 liters of soda.

First, we need to decide what kind of test is to be done and then determine the null and alternative hypothesis.

$$H_0 : \mu = 2$$

$$H_1 : \mu \neq 2$$

From the menu bar, select ANALYSIS >> HYPOTHESIS TESTING >> MEAN 1 SAMPLE and fill in the dialog box with the appropriate information. When it is completed, click on the Evaluate button. You should have the dialog box below.

1) Pop. Mean = Claimed Mean

Significance: 0.01
Claimed Mean: 2
Population St Dev: (if known) 0.2
Sample Size, n: 40
Sample Mean: 1.95
Sample St Dev, s:

Claim: $\mu = \mu(\text{hyp})$
z Test
Test Statistic, z: -1.5811
Critical z: ± 2.5758
P-Value: 0.1138

99% Confidence interval:
 $1.868545 < \mu < 2.031455$

Fail to Reject the Null Hypothesis
Sample does not provide enough evidence to reject the claim

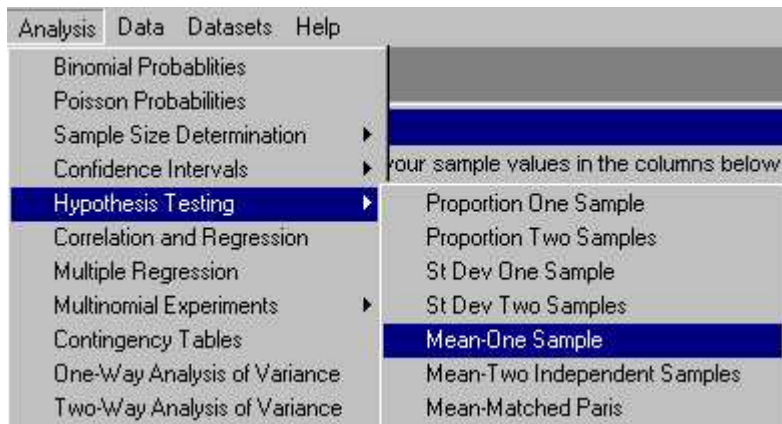
Buttons: Evaluate, Plot, Help?, Print

Since the test statistic is in the non-critical region, we fail to reject the null hypothesis. The conclusion is “The sample evidence does not provide enough evidence to reject the claim that the mean amount of soda is 2 liters.”

TEXT SECTION 6.4

EXAMPLE: The Fluffy Lump is a cat toy company that sells catnip by the pound. Although the boxes are advertised at 16 oz., a random sample of 24 boxes yielded a mean of 16.2 oz. and a standard deviation of 0.035 oz. Construct a 95% confidence interval for the population mean weight of boxes of catnip.

From the menu bar, select ANALYSIS >> HYPOTHESIS TESTING >> MEAN ONE SAMPLE



You will be presented with the dialog box on the next page.

SD Hypothesis Testing: One Mean

1) Pop. Mean = Claimed Mean

Significance: 0.05

Claimed Mean: 100

Population St Dev:
(if known)

Sample Size, n: 100

Sample Mean: 100

Sample St Dev, s: 10

Evaluate Plot

Help ? Print

For any confidence interval question, we will leave the first box as Pop. Mean = Claimed Mean. Again, that involves the hypothesis test which we will cover in chapter 7.

For our example, we have a significance level of 05, a population mean believed to be 16, a sample mean of 16.2 and a (sample) standard deviation of 0.035.

Filling in the dialog box, we have

SD Hypothesis Testing: One Mean

1) Pop. Mean = Claimed Mean

Significance: 0.05

Claimed Mean: 16

Population St Dev:
(if known)

Sample Size, n: 24

Sample Mean: 16.2

Sample St Dev, s: 0.035

Evaluate Plot

Help ? Print

Click on the Evaluate button and you have the screen below.

SD Hypothesis Testing: One Mean

1) Pop. Mean = Claimed Mean

Significance: 0.05

Claimed Mean: 16

Population St Dev:
(if known)

Sample Size, n: 24

Sample Mean: 16.2

Sample St Dev, s: 0.035

Evaluate Plot

Help ? Print

Claim: $\mu = \mu(\text{hyp})$

t Test

Test Statistic, t: 27.9942

Critical t: ± 2.0687

P-Value: 0.0000

95% Confidence interval:
 $16.18522 < \mu < 16.21478$

Reject the Null Hypothesis

Sample provides evidence to reject the claim

We can say with 95% confidence, that the populations mean weight of boxes of catnip sold by Fluffy Lump is between 16.19 oz. and 16.2 oz.

TEXT SECTION 7.5

EXAMPLE: CB & O Enterprises sells premium cat treats for the sophisticated feline. Although the packages are advertised to contain 8 oz. of treats, a random sample of 24 boxes yielded a mean of 7.85 oz. and a standard deviation of 0.035 oz. Oriole-Camden, my resident expert on treats feels she is being cheated and she is not happy about that. At the 0.05 level of significance, test her claim.

$$H_0 : \mu = 8$$

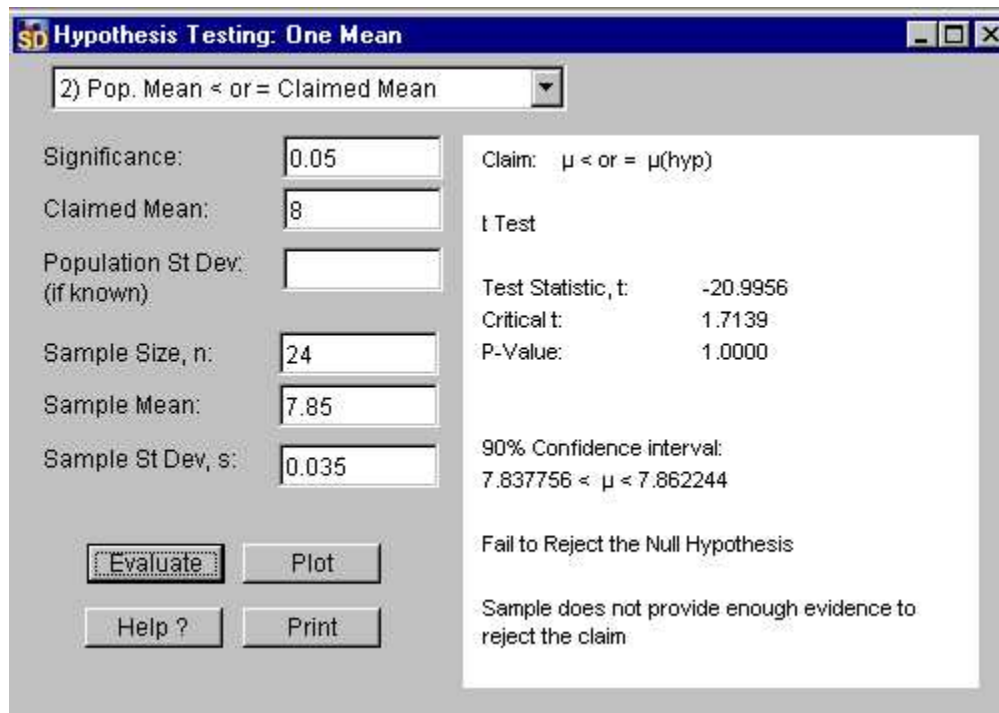
$$H_1 : \mu \leq 8$$

From the menu bar, select ANALYSIS >> HYPOTHESIS TESTING >> MEAN ONE SAMPLE and fill in the corresponding dialog box. Your screen should be the same as the one below.

The screenshot shows a dialog box titled "Hypothesis Testing: One Mean". The dropdown menu is set to "2) Pop. Mean < or = Claimed Mean". The input fields are: Significance: 0.05, Claimed Mean: 8, Population St Dev: (if known) (empty), Sample Size, n: 24, Sample Mean: 7.85, and Sample St Dev, s: 0.035. The buttons at the bottom are Evaluate, Plot, Help?, and Print.

Notice that under the options for which type of hypothesis test we want to conduct, we choose option 2, Pop Mean < or = Claimed Mean.

Click on the Evaluate button to get your results.



Based on our computer output, we fail to reject the null hypothesis. Our conclusion is that the sample data does not provide enough evidence to reject Oriole-Camden’s claim that she is being cheated out of treats.

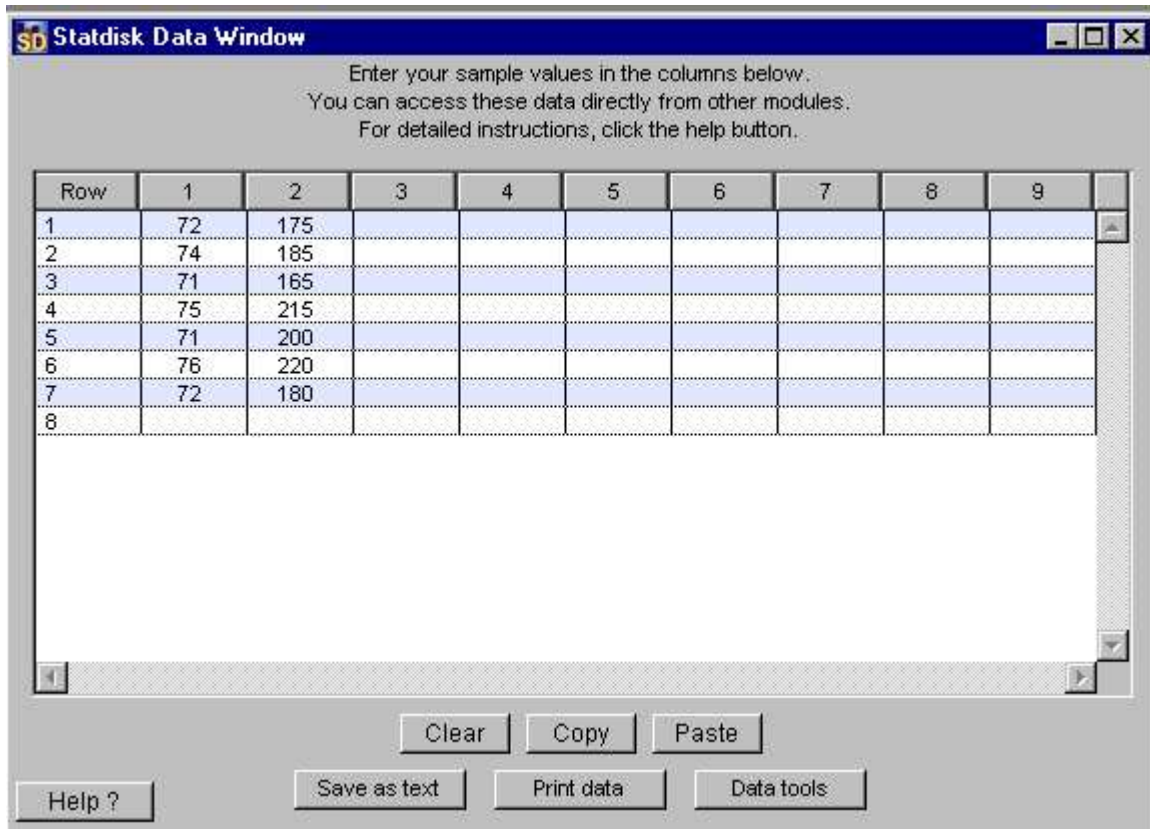
Linear Regression

Example: Listed below are the heights and weights of a random sample of 7 Seattle Mariners. Create a scatter plot and determine the correlation coefficient and regression equation for the data listed below.

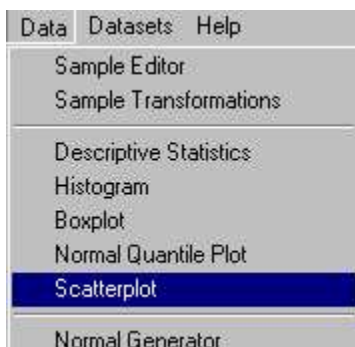
x-height	72	74	71	75	71	76	72
y-weight	175	185	165	215	200	220	180

First, you need to enter the data into the Statdisk spreadsheet. To do this, simply enter the data for the x values (the height) in column 1, hitting “ENTER” after

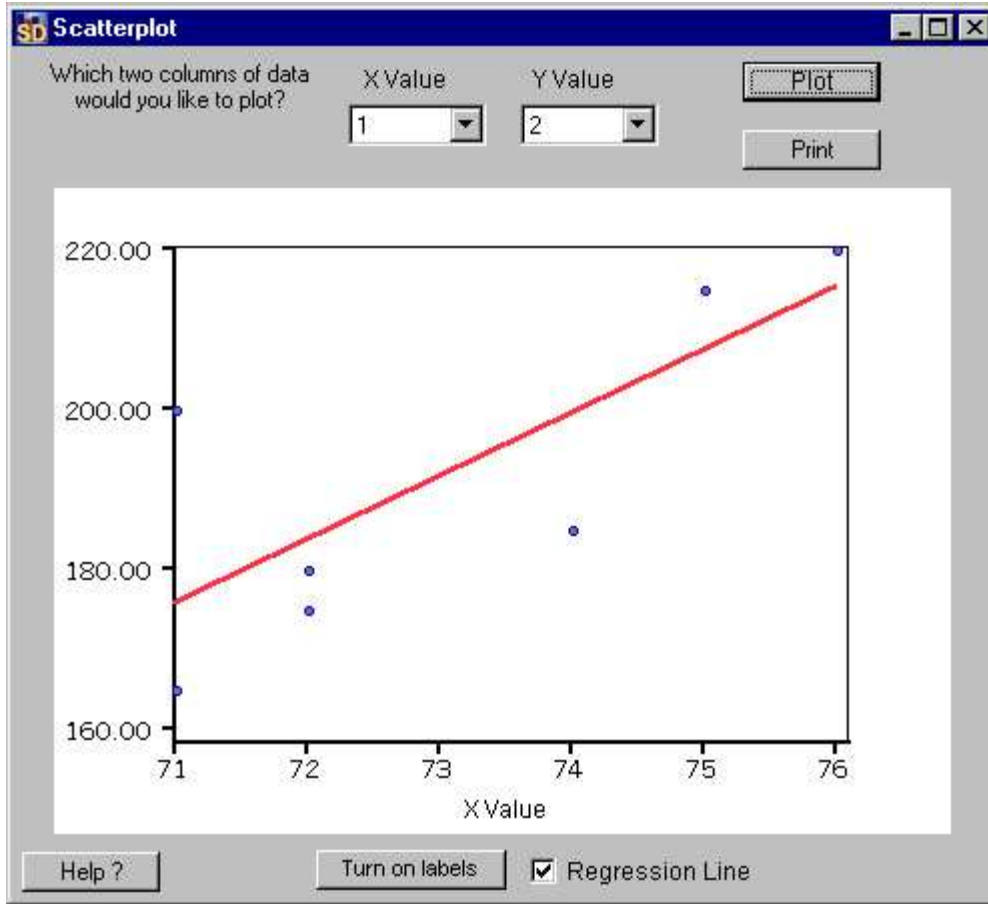
each data element. Then go back to the top of column 2 and enter the y values (the weights). Your spreadsheet should look like the one below.



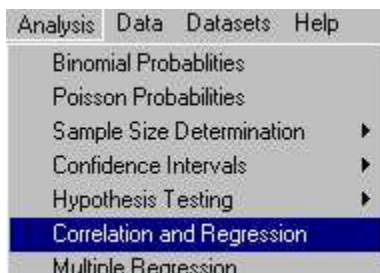
To create the scatter plot, from the menu bar, select DATA >> SCATTER PLOT.



Simply click on the PLOT button and you will be presented with a scatter plot and the regression equation on the same graph. To turn off the regression equation, simply click on the box next to "Regression Line". See figure below.



To determine the correlation coefficient and regression equation, from the menu bar select ANALYSIS >> CORRELATION and REGRESSION.



Simply hit the EVALUATE button and you will be presented with the screen below.

SD Correlation and Regression

Significance:

Select the columns to be used for the x and y variables:

x variable column: y variable column:

Sample size, n: 7
Degrees of freedom: 5

Correlation Results:
Correlation coeff, r: 0.762707
Critical r: ±0.7544919

Reject the Null Hypothesis
Sample provides evidence to support linear correlation

Regression Results:
Y = $b_0 + b_1x$
Y Intercept, b_0 : -386.4881
Slope, b_1 : 7.916667

Total Variation: 2585.714
Explained Variation: 1504.167
Unexplained Variation: 1081.548
Standard Error: 14.70746
Coeff of Det, R^2 : 0.5817219