Problem # 2.1-A large investment firm on Wall Street wants to review the distribution of ages of its stockbrokers. The firm believes that this information can be useful in developing plans to recruit new brokers. The ages of a sample of 40 brokers are shown here.

46	28	51	34	29	40	38	33	41	52
53	40	50	33	36	41	25	38	37	41
36	50	46	33	61	48	32	28	30	49
41	37	26	39	35	39	46	26	31	35

a. Draw a stem and leaf display
b. Draw a histogram
c. Draw an ogive

Problem # 2.2-What is the difference between a histogram and a bar chart? For what type of data would each be appropriate?

Problem # 2.3 -The accompanying data describe the hourly wage rates (dollars per hour) for 30 employees of an electronics firm:

22.66	24.39	17.31	21.02	21.61	20.97	18.58	16.61
19.74	21.57	20.56	22.16	20.16	18.97	22.64	19.62
22.05	22.03	17.09	24.60	23.82	17.80	16.28	19.34
22.22	19.49	22.27	18.20	19.29	20.43		

Construct a frequency distribution and a histogram for these data.

Problem # 2.4-In the following Stem-and-leaf display for a set of two-digit integers, the stem is the 10's digit, and each leaf is the 1's digit. What is the original set of data?

2|002278
3|011359
4|1344
5|47

Chapter 3- Descriptive Statistics: Numerical measures

Problem # 2.5 -Consider the following sample of n = 7 measurements: 5, 7, 4, 5, 20, 6, 2.
*Do not forget to rewrite your data in order:

a. Calculate the mean of this sample.
b. Calculate the median m of this sample.
c. Eliminate the last measurement (the 2) and calculate the median of the remaining n=6 measurements.
d. What is the mode to these measurements? Can you have many modes?

Problem # 2.6-According to Honda Motor Co., Inc., the exchange rate (yen per U.S. dollar) from 1998 through 2005 was 123,128,112,111,125,122,113, and 108. Determine the mean and median for these data. Is there a mode? If so, what is its numerical value?
Source: Honda Motor Co., Ltd., 2005 Annual report.

Problem # 2.7-A reading test with 120 possible points yields a bell-shaped distribution with scores ranging from 5 to 50 on a large sample of third graders. If the same test were administered to first graders, what would we expect the form of the frequency distribution to be?

Problem # 2.8- Measures of Variability: Percentiles, Quartiles, Interquartile Range
Data set: 0, 7, 12, 5, 33, 14, 8, 0, 9 , 22
Rewrite Data Set:

a. Calculate the 50^{th}, 25^{th} percentiles of the data above.
b. Find the interquartile range
c. Calculate the standard deviation

Problem # 2.9 - Answer the following questions about variability of data sets:

a. What is the primary disadvantage of using the range to compare the variability of data sets?
b. Can the variance of a data set ever be negative? Explain.
c. Can the variance ever be smaller than the standard deviation? Explain.

Problem # 2.10-Provide a real or hypothetical example of a situation where the range could be misleading as a measure of dispersion.

Problem # 2.11- The annual salaries of the employees of a chain of computer stores produced a positively skewed histogram. The mean and standard deviation are $ 28,000 and $3,000 respectively. What can you say about the salaries at this chain?

Problem # 2.12-Land purchase decision. A buyer for a lumber company must decide whether to buy a piece of land containing 5,000 pine trees. If 1,000 of the trees are at least 40 feet tall, the buyer will purchase the land; otherwise, he won't. The owner of the land reports that the height of the trees has a mean of 30 feet and a standard deviation of 3 feet. Based on this information, what is the buyer's decision?

Problem # 2.13-Suppose a data set consisting of exam scores has a lower quartile $Q_L = 60$, a median m = 75, and an upper quartile $Q_U = 85$. The scores on the exam range from 18 to 100. Without having the actual scores available to you, construct as much of a box plot as possible.
Partial Data: 18,25…100.

Problem # 2-14- Putting all together
Mean, median mode- Consider the following data: 12,15,17,18,12,14,11,10, 3, 9

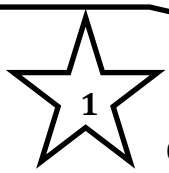
- Calculate the mean, median, mode
- Calculate the variance and standard deviation
- Create a Five-Number Summary
- Construct a Box Plot
- Identify the outliers

This is 1 of the 5 **Star Problems.**

Next week, I will notify you about the Midterm Prep Package, it includes:

-Learning Objectives
-5 Star Problems from a past Midterm.

Note: Answers to these Star Problems will only be given during class.
We will work through them as we progress towards the Midterm.
Pay close attention, they aren't that straight forward.



HOXPLOT CASE ANALYSIS

One of the major measures of the quality of service provided by any organization is the speed with which it responds to customer complaints. A large carpet company was receiving complaints about the installation of carpets. The data below give the number of waiting days (Xi) between the receipt and resolution of a complaint for a random sample of customers with complaints.

72	**20**	**29**	**23**	**30**	**27**	**25**	**32**	**4**	**29**
29	**31**	**27**	**60**	**13**	**51**	**36**	**5**	**26**	**1**
12	**22**	**14**	**28**	**35**	**26**	**9**	**34**	**3**	**1**

A- Construct a box plot for the data set and comment on the nature of the plot including identifying outliers, if any.

B- Compute the proportion of observations that are within one, two and three standard deviations of the mean. Does the empirical rule apply for this data set? Use z scores to identify outliers, if any.

C- To improve services, management wants to grant a special offer to customers whose complaints take unnecessarily longer periods to resolve. However, it is desirable that no more than 25% of the customers who lodge a complaint would receive the special offer. Approximately, what number of waiting days between the receipt and resolution of a complaint may be used for the cutoff?

Understanding the Basics: Suggested Problems from the Book.

In **Bold** are the Suggested Problems, in Green are the problems on Connect and the book.

	Chapter 2																		
2.1	Graphically Summarizing Qualitative Data	**2.01**	**2.02**	**2.03**	**2.04**	**2.05**	**2.06**	**2.07**	2.08	2.09	2.10	2.11	**2.12**						
2.2	Graphically Summarizing Quantitative Data	**2.13**	**2.14**	**2.15**	**2.16**	**2.17**	**2.18**	2.19	2.20	2.21	2.22	2.23	**2.24**	2.25	2.26	2.27			
2.3	Dot Plots	**2.28**	**2.29**	2.30	2.31	**2.32**													
2.4	Stem-and-leaf Displays	**2.33**	**2.34**	**2.35**	2.36	2.37	**2.38**	**2.39**	**2.40**	2.41	2.42	**2.43**							
2.5	Contingency Tables	**2.44**	**2.45**	**2.46**	**2.47**	**2.48**	**2.49**	2.50	2.51	2.52									
2.6	Scatter Plots	**2.53**	**2.54**	**2.55**	**2.56**														
2.7	Misleading Graphs and Charts	2.58	2.59	2.60	**2.61**														
2.8	Descriptive Analytics	**2.62**	**2.63**	**2.64**	2.65	2.66	2.67	2.68											
	Supplementary	**2.69**	**2.70**	2.71	**2.72**	**2.73**	2.74	2.75	2.76	2.77	**2.78**	**2.79**	**2.80**	2.81	**2.82**	2.83	**2.84**	**2.85**	2.86

	Chapter 3															
3.1	Describing Central Tendancy	**3.01**	**3.02**	**3.03**	**3.04**	3.05	**3.06**	3.07	**3.08**	**3.09**	**3.10**	**3.11**	3.12	3.13	3.14	3.15
3.2	Measures of Variation	**3.16**	**3.17**	**3.18**	3.19	**3.20**	**3.21**	**3.22**	**3.23**	**3.24**	**3.25**	3.26	**3.27**			
3.3	Percentiles, Quartiles, and Box and Whiskers Display	**3.28**	**3.29**	**3.30**	**3.31**	3.32	3.33	3.34	**3.35**							
3.4	Covariance, Correlation,and the least squares line	**3.36**	**3.37**	**3.38**	**3.39**											
3.5	Weighted means and grouped data	**3.40**	**3.41**	**3.42**	**3.43**	3.44	**3.45**	**3.46**	3.47							
3.6	the geometric mean	**3.48**	**3.49**	3.50	3.51	3.52	3.53									
	Supplementary	3.70	3.71	3.72	3.73	3.74										

This statistical workbook is compiled from the following books:

- Keller, G. (2012). *Statistics for management and economics*. Mason: Cengage Learning.
- McClave, J. T., Benson, G. P., & Sincich, T. (2008). *Statistics for Business and Economics*. New Jersey: Prentice Hall.
- Weiers, R. M. (2011). *Introduction to Business Statistics*. Mason: Cengage Learning.
- (GMAC), F. t. (Ed.). (2005). *GMAT -Quantitative Review.* Oxford, UK: Blackwell.
- Bowerman, B. L., O'Connell, R. T., Murphree, E., Huchendorf, S. C., & Porter, D. C. (2003). *Business statistics in practice*(pp. 728-730). New York: McGraw-Hill/Irwin.