

MGT 233 – Homework #1, Fall 2011

This homework assignment is due at the beginning of class on September 11, 2011.

Instructions: For each problem use the proper statistics notation, show the intermediate work, write the equation you are using, give the proper units of measure, and write clearly. When interpreting an answer do not tell about the procedure, instead write a proper English statement that explains the meaning of the answer with respect to the problem context.

Problem #1



Since 1934, the Masters have been played by the top golfers in history. The champions have varied and so have the final scores. The best score came in 2010 with Phil Mickelson shooting a score of 272 *strokes*. As of 2010, the champions scores over the past ten years have been:

Year	Score (strokes)
2010	272
2009	276
2008	280
2007	289
2006	281
2005	276
2004	279
2003	281
2002	276

For the past ten years of championship golfing, for the scores:

- compute and interpret the mean
- compute the range
- compute the variance
- compute the standard deviation
- compute the coefficient of variation for the scores.

Problem #2



(CBS/AP) MINERAL, Va. - For a few minutes from Georgia to Maine, the question rang out: What was that? The answer — a rare East Coast earthquake, magnitude 5.8 — was far down on the list for most not used to the earth shaking beneath them.

There ended up being no known deaths or serious injuries, but cracks appeared in the Washington Monument and the National Cathedral, which had three capstones break off its tower. Windows shattered and grocery stores were wrecked in Virginia, where the quake was centered. The White House and Capitol were evacuated.

Several earthquakes have occurred throughout the world in 2011; a sample of the most recent earthquake magnitudes provided the following data: 5.8, 5.3, 4.6, 7.0, 7.1, 6.3, 6.8, 6.7, and 6.1.

- a) Compute the range
- b) Compute the interquartile range
- c) Compute the sample variance
- d) Compute the sample standard deviation
- e) Find the coefficient of variation
- f) A sample of earthquakes from 2010 provided a sample mean of 6.15 and a sample standard deviation of .56. What comparisons can you make between the earthquakes occurring in 2011 and 2010 based on these descriptive statistics?

Problem #3



(CBS News) TIRANA, Albania - A US-Albanian archaeological mission says it has found the well-preserved wreck of a Roman cargo ship complete with some 300 — empty, alas — wine jars off Albania's coast. The 30-yard long wreck dates to the 1st century B.C. and its cargo is believed to have been the produce of southern Albanian vineyards, en route to western European markets.

Only a few of the bottles were found to be in perfect condition, they were sold at an average price of \$2500 with a standard deviation of \$100. What are the z-scores for the following sale prices: \$2650, \$2800, \$1950, and \$2400?

Problem #4



Espn.com— Derek Jeter is a professional baseball player, having spent his entire career as a member of the New York Yankees. The shortstop and team captain since 2003 has led his team to five World Series titles and is the all-time hits leader at his position.

Derek Jeter's current batting average for this season is .290 with a standard deviation of .005. Using Chebyshev's theorem, determine the percentage of Jeter's batting average that is within the given ranges in a single game.

a) .280 to .300

b) .240 to .340

c) .270 to .310

Problem #5



NEW YORK (CNN/Money) -- These cars top the rankings in the United States Department of Energy and Environmental Protection Agency's 2010 Fuel Economy Guide. These are the cars that got the best gas mileage, according to government tests: Honda Insight, Toyota Prius, Honda Civic, Honda Insight, Toyota Prius Honda Civic Hybrid, Volkswagen Diesel New Beetle/Golf/Jetta, and Toyota Echo.

According to a study done looking at engine size and average gas mileage on the highway, results were as followed:

Make	Model	X Engine Size (liters)	Y HWY Mileage (miles/gallon)
Honda	Insight	1	66
Toyota	Prius	1.5	51
Chevrolet	Impala	3.4	32
Dodge	Intrepid	2.7	29
Honda	Civic	1.7	44
Toyota	Corolla	1.8	40
Buick	Lesabre	3.8	29
Ford	Ranger	2.3	29
Nissan	Frontier	2.4	27

Be sure to show all work with proper notation. Do not forget to include the units of measure for all steps.

- Find and interpret the mean and standard deviation for the engine sizes.
- Find the mean and standard deviation for the highway mileages.
- Compute the sample covariance.
- Compute the correlation coefficient.
- What is the relationship between a vehicles engine size and highway gas mileage?

Problem #6



(WebMD) CBSnews.com— College students who are "morning people" may have a higher chance of graduating near the top of their class even after taking into account other factors related to higher GPAs, such as verbal SAT scores and other standardized tests that measure academic ability. The questionnaire gauges "whether you're a morning or evening person based on what time of day is best for you - that is, if there were no constraints on your life, when would you go to bed and wake up; when are you most productive," says researcher Daniel J. Taylor, PhD, an assistant professor of psychology at the University of North Texas in Denton.

A sample of students was used to determine if college students who go to sleep earlier and tend to get more sleep really do get better grades. Below are the results:

X Hours of Sleep	Y GPA
6	3.5
5	2.5
4	2.4
5	2.2
8	3.6
7	4.0
8	3.8
5	2.5
5	3.0
6	3.1

Be sure to show all work with proper notation. Do not forget to include the units of measure for all steps.

- Find the mean and standard deviation for the hours of sleep that the college students receive.
- Find the mean and standard deviation for the GPAs of the college students.
- Compute the covariance.
- Compute and interpret the sample correlation coefficient.

Problem #7

The NFL (National Football League) has 32 teams which are broken down into eight divisions. Each division has four teams. Taking a sample of games from the Chicago Bears 2010 football season, we can study the number of points that Chicago gained compared to its opponent by looking at the scores of each game.



The following shows the points gained per game by the Chicago Bears during the 2010 season over their opponents. The data was found by subtracting the points earned by the opponent from the points that Chicago earned. Negative values indicate the Chicago Bears lost the game.

(Round all work to 4 decimal places.)

Number of Points Gained	Number of Games (f_i)
-25 to -16	1
-15 to -6	5
-5 to 4	8
5 to 14	5
15 to 24	2
25 to 34	1

- Create a histogram of the data.
- Find and interpret the mean of the points gained.
- Find and interpret median of the points gained.
- Compute the variance of the number of points gained.
- Compute the standard deviation of the number of points gained.