

1. (5 points) Which of the following is a true statement about correlation?

A. Correlation implies causation.

B. The correlation r is a measure of the predictive strength of a linear relationship between an explanatory and response variable.

C. The correlation is a measure of the effect of lurking variables.

D. The correlation is a measure of the likelihood that a change in the explanatory variable causes a change in the response variable.

2. (5 points) If a distribution is skewed to the left,

A. the mean is greater than the median.

B. the mean and the median are equal.

C. the mean is less than the median.

3. (5 points) Using a regression to make a prediction for a value which falls far outside the range of your data set

A. is considered good statistical practice only when the effect of lurking variables has been accounted for.

B. is discouraged if we cannot conclude a cause and effect relationship.

C. often gives inaccurate and/or absurd results.

D. very often gives accurate results.

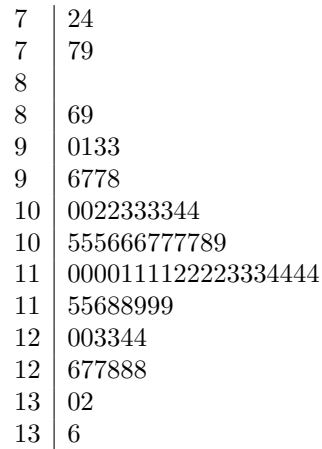
4. (5 points) The length of human pregnancies from conception to birth varies according to a distribution that is approximately Normal with mean 266 days and standard deviation 16 days. About 68% of pregnancies last between

A. 234 and 298 days.

B. 250 and 282 days.

C. 218 and 314 days.

5. (20 points) Below is a stemplot of the IQ test scores of 78 seventh-grade students in a rural midwestern school.



(a) Four students had low scores that might be considered outliers. Ignoring these, describe the shape, center, and spread of the remainder of the distribution.

(b) We often read that IQ scores for large populations are centered at 100. What percent of these 78 students have scores above 100?

6. (20 points) This is a standard deviation contest. You must choose four numbers from the whole numbers 0 to 10, with repeats allowed.

(a) Choose four numbers that have the smallest possible standard deviation.

(b) Choose four numbers that have the largest possible standard deviation.

(c) Is more than one choice possible in either (a) or (b)? Explain.

7. (20 points) Scores on the Wechsler Adult Intelligence Scale (WAIS) are approximately Normal with mean 100 and standard deviation 15. People with WAIS scores below 70 are considered mentally retarded when, for example, applying for Social Security disability benefits. According to the 689599.7 rule, about what percent of adults are retarded by this criterion?

8. (20 points) Sulfur, the ocean, and the sun. Sulfur in the atmosphere affects climate by influencing formation of clouds. The main natural source of sulfur is dimethyl sulfide source of sulfur is dimethyl sulfide (DMS) produced by small organisms in the upper layers of the oceans. DMS production is in turn influenced by the amount of energy the upper ocean receives from sunlight. Here are monthly data on solar radiation dose (SRD, in watts per square meter) and surface DMS concentration (in nanomolars) for a region in the Mediterranean.

SRD	12.55	12.91	14.34	19.72	21.52	22.41	37.65	48.41
DMS	0.796	0.692	1.744	1.062	0.682	1.517	0.736	0.720
SRD	74.41	94.14	109.38	157.79	262.67	268.96	289.23	
DMS	1.820	1.099	2.692	5.134	8.038	7.280	8.872	

(a) Make a scatterplot that shows how DMS responds to SRD.

(b) Describe the overall pattern of the data. Find the correlation r between DMS and SRD. Because SRD changes with the seasons of the year, the close relationship between SRD and DMS helps explain other seasonal patterns.