

GUIDELINES FOR HOMEWORK REPORTS  
STAT 320

- Answers to all the questions should be based on the data observed. Any conclusion not based on the data given (or other reliable source) will be a conjecture. Conjectures are very important in the human endeavor, but are only that, conjectures (synonyms: guess, deduction, speculation, suspicion, hypothesis, shot in the dark, opinion, supposition).
- Answers should be direct, concise, to the point.
- Supporting computer results should be included in your report and be clearly referenced in the text. Please staple your answers and the attached computer outputs together.
- “A picture is worth a thousand words.” Use lots of plots, graphs, tables, to make your point clear.
- A picture is not an answer to any question without an interpretation!.

STAT 320: Assignment 1.  
Due February 1 (Wednesday)

January 27/2006

**(A) Data: C2\_GLIFE and descriptive statistics**

During the 1990-1991 Policy year, the university of Wisconsin Insurance Association Group life Insurance Plan paid thirty death claims. Data are in C2\_GLIFE.

- 1- Are these data cross-sectional or longitudinal?
- 2- Are these data observational or experimental?
- 3- Provide a Histogram of the death claims.
- 4- From the data set, calculate the mean, the median, the mode, the variance, the standard deviation, the first and third quartile Q1 and Q3, the inter-quartile range and the coefficient of variance of the death claims?
- 5- Describe the distribution of the death claims. Your conclusion

**(B) Real data and Histogram**

Consider the following data set {41, 58, 26, 31, 34, 56, 33, 32, 51, 48, 40, 41, 60}

- (a) Calculate the mean, median, mode, Q1, Q3, range, inter-quartile range of the data above

- (b) Represent the data set using a histogram with class width five, and the lower boundary of the first class is 25.
- (c) Represent the data with a normal curve. To specify the normal curve, give the mean and the standard deviation that you would use with your curve.
- (d) What is the expected value of this Data set using:
  - (i) The original data
  - (ii) The histogram constructed in part (a)
- (e) Using the normality assumption, what is the 70th percentile of this data

### (C) Data: C2\_RENT and confidence Interval

A manufacturer is considering two suppliers. Independent random samples of ten parts from shipments from each supplier are selected, and the lifetime in hours for each part is determined for each sample. Use the following information to construct a 98% confidence interval estimate of the difference in the population average lifetimes. Assume that the population variances are equal and the populations are normally distributed.

	Supplier 1	Supplier 2
Sample size	10.0	10.0
Sample mean	15.0	11.0
Sample standard deviation	1.5	1.0

### (D) Data: C2\_HOSPITAL and point estimate

Managers need to be able to estimate health care costs and to measure how reliable their estimates are. Suppose that you are the risk manager for a large corporation and are trying understand the cost of one aspect of health care, hospital costs. You decide to look as a small, homogeneous groups of claims, the charges for female patients, aged 30-49 who were admitted to the hospital for circulatory disorders.

- 1- Provide a histogram of the hospital cost. We define the best estimate by the average. What is the **best estimate** of the hospital cost?
- 2- What is the estimated standard deviation of this point estimate calculated in (1)?
- 3- Using the histogram, calculate the hospital expected health cost.
- 4- What is the probability of claiming a cost larger than 1500.

### (E) American Airlines and coefficient of variance

Researchers at American airlines and Sabre have developed a system to coordinate scheduling, yield management, and pricing decisions (ORMS Today, August 2000, pp. 36-44). In one of their examples they set up the following scenario: “Consider the case of a single flight leg with one fare class. For this example, we assume that the passenger demand follows a normal distribution with mean of 125 passengers and a coefficient of variation of 0.3. The capacity of the leg is assumed to be 150 seats”.



