

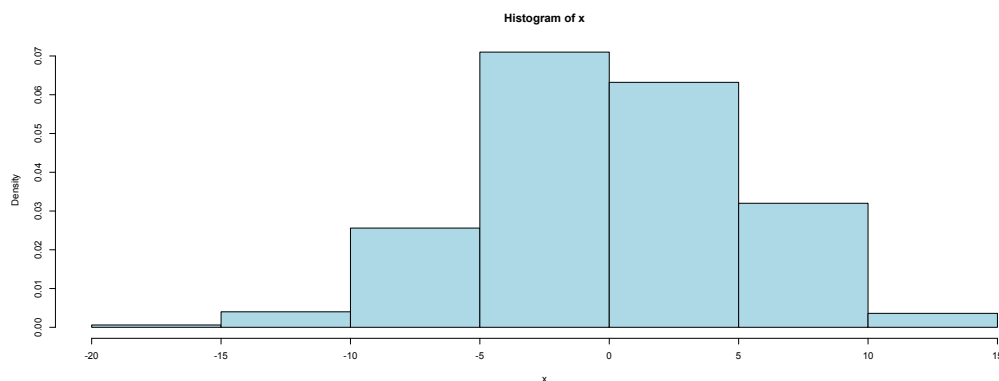
HOMEWORK 2: MATH 183 WINTER 2013

DUE IN CLASS ON FRIDAY JAN 18TH

Problem 1.

(a) Compute mean, median, standard deviation and 20% percentile of the data that has density histogram as in Figure 1. Sample size was 1000.

FIGURE 1. Histogram of Problem 1



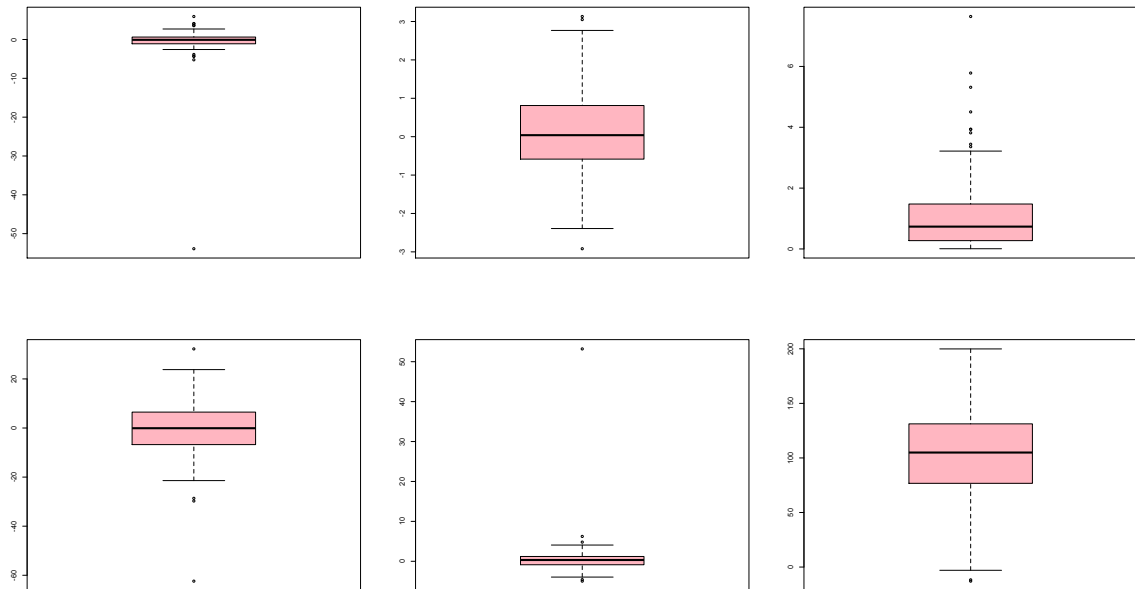
(b) How would you do this problem if you only had to work with frequency histogram ?

Problem 2. Suppose we have two datasets. One of size n with sample mean $\bar{x}_n$ and the other of size n generated as $y_i = ax_i + b$, with a and b being real numbers. Find relationship between sample mean $\bar{x}_n$ and $\bar{y}_n$ and between sample variance of the first data set s_1^2 and sample variance of the second data set s_2^2 .

Problem 3. Figure 2 displays several box plots. It is known that all figures correspond to datasets of size 200 that are generated from symmetric and little volatile, symmetric and more volatile, right skewed and more volatile, right skewed and less volatile, left skewed and more volatile, and left skewed and less volatile distributions (6 distributions in total).

Report for each figure from which distribution the dataset was generated. Explain your answers in many details! For example, what characteristics did you look for when making your decision ?

FIGURE 2. Boxplots of Problem 3



Problem 4. Solve following problems [Provide details of all of your computation].

- Let A and B be two events in a given sample space. If $P(A) = 1/3$, $P(B) = 2/3$ and $P(A \cap B) = 1/9$ what is $P(A \cup B)$?
- Consider events A , B and C that can occur in some experiment. Is it true that the probability that *only A occurs* (and not B and C) is equal to $P(A \cup B \cup C) - P(B) - P(C)$?
- The rule $P(A \cap B) = P(A) + P(B) - P(A \cup B)$ is useful for computing unions and intersections of two events. What would be the analogous rule for three events ?

Solve following exercises from Larsen and Marx.

Problems 5.-7.: Questions 2.7.12, 2.7.15, 2.7.19.

Solve following exercises from OpenIntro Statistics.

Problem 8. Exercise 2.12.