Probability and Statistics, Fall 2006, BCC CUNY

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Preview Test 1 (chapters 1-4)

1. Use a random-number table to simulate the outcomes of tossing a quarter 23 times. Assume the quarter is balanced (i.e. fair).

2. Suppose you have been walking for 20 minutes each day for 2 weeks. And for each day you recorded the distance you covered in 20 minutes. Distance is measured in miles.

day	1	2	3	4	5	6	7	8	9	10	11	12	13	14
distance	0.5	0.7	0.6	1	0.7	0.8	0.9	0.6	0.8	1	1.1	1.3	1.4	1.3

   Make a time plot.

3. Driving under the influence of alcohol (DUI) is a serious offense. The following data give the ages of a random sample of 50 drivers arrested while driving under influence of alcohol. This distribution is based on the age distribution of DUI arrests given in the Statistical Abstract of the United States (112th Edition).

   46 16 41 26 22 33 30 22 36 34
   63 21 26 18 27 24 31 38 26 55
   31 47 27 43 35 22 64 40 58 20
   49 37 53 25 29 32 23 49 39 40
   24 56 30 51 21 45 27 34 47 35

   a) Make stem-and-leaf display of the age distribution
   b) Make a histogram showing class boundaries (don't forget to make a frequency table first). Use seven classes.

4. Radon is a gas emitted from the ground that can collect in houses and buildings. At certain levels it can cause lung cancer. Radon concentrations are measured in picocuries per litter (pCi/L). A radon level of 4 pCi/? is considered "'acceptable"'. Radon levels in a house vary from week to week. In one house, a asample of 8 weeks had the following readings for radon level (in pCi/L):
   1.9 2.8 5.7 4.2 1.9 8.6 3.9 7.2
   a) Find the mean, median and mode
   b) Find the sample standard deviation, coefficient of variation and the range.
   c) find quartiles Q_1, Q_2, Q_3 and make box-and-whiskers plot.
   Find interquartile range.

5. Modern medical practice tells us not to encourage babies to become too fat. Is there a positive correlation between the weight x of a 1-year-old baby and the weight y of a mature adult (30 years old)?
A random sample of medical files produced the following information for 14 females:

x (lb)	21	25	23	24	20	15	25	21	17	24	26	22	18	19
y (lb)	125	125	120	125	130	120	145	130	130	130	130	140	110	115

(a) Draw a scatter diagram for the data.

(b) Looking at the scatter diagram, do you think the correlation coefficient is positive, negative, or zero?

(c) Find r. Find the coefficient of determination.

(d) Find $\bar{x}$, $\bar{y}$, a and b and the equation of the least-squares line

(e) Graph the least-squares line on your scatter diagram

(f) If a female baby weights 20 lb at 1 year, what would you predict she would weight at 30 years of age?