

HOME ASSIGNMENT 5 (18.05, SPRING 2007)

Read: *Dekking et al.* Chapter 15, 16.

Solve: Problems 15.1, 15.5, 15.9, 15.10, 16.1, 16.2, 16.4, 16.9, 16.12 and problems below (15 points each):

Problem. Use the data here:

<http://www.census.gov/popest/states/NST-ann-est.html>

<http://www.census.gov/population/censusdata/urpop0090.txt>

<http://www.census.gov/hhes/www/income/histinc/f03ar.html>

(see also links from the web page).

A. Compute the mean and median population of the 50 US states on July 1, 2006. Compute $q_{50}(0.237)$, $q_{50}(0.784)$ and $q_{50}(0.926)$. Compute MAD_{50} and IQR .

B. Divide the states into quintiles according to the population on July 1, 2000 (least populous ten states in the first quintile, next populous ten state in the second quintile, etc.)

Compute the average population of the states in each quintile. Compute the average population growth of each quintile in the 5 years from July 1, 2000 to July 1, 2006. Which quintile grew faster?

C. Divide the states into quintiles according to the total population in 1900 and 1950 (see second link). Construct a 5×5 quintile mobility matrix from 1900 to 2000: the (i, j) -th entry is the number of states in i -th quintile in 1900 and j -th quintile in 2000. Similarly, construct a 5×5 quintile matrix mobility from 1950 to 2000.

D. Suppose five people P_1, \dots, P_5 are chosen, which happen to have exactly the median income in the corresponding quintile, each year between 1966 and 2005 (see third table). Let X_t be the income of the random person of the five in year t , so X_t is a d.r.v. Find pairwise correlations between X_t for $t = 1966, 1975, 1985, 1995, 2005$.

This Homework is due Wednesday April 4 at 4 pm. in 2-108 (UMO)