

Statistics 2000, Section 001, Quiz 1 (200 Points)

September 28, 2001, Dr. Jürgen Symanzik

Your Name: _____

First look at all 4 questions. Then start with the question that looks easiest to you. Continue with a more difficult question. Try to answer as many questions as possible in these 50 minutes.

Note that you will obtain at least partial credit if you indicate a correct formula but your final result is incorrect. If you just rely on your calculator without indicating the formula that should be used and your result is incorrect, you will obtain no credit at all for this part of a question.

Question 1: Numbers and Graphs (60 Points)

After Homework 4, we are somewhat suspicious that the circulation of 1.1 million for “Shape” may have been obtained by some manipulation, e.g., by providing free issues as an advertisement. Therefore, we discard this number as an outlier and redo parts of our analysis of the “Weider Empire” magazine circulation based on the following 9 magazines:

Magazine Name	Circulation
Muscle & Fitness	450,000
Living Fit	320,000
Men’s Fitness	300,000
Jump	300,000
Senior Golfer	240,000
Fit Pregnancy	200,000
Prime Health & Fitness	175,000
Flex	150,000
Shape Cooks	130,000

Please answer the following questions:

1. Determine the mean magazine circulation for the “Weider” empire based on these 9 magazines. (10 Points)
2. Determine the median magazine circulation for the “Weider” empire based on these 9 magazines. (10 Points)

Question 2: Normal Distribution (50 Points)

Part I:

Let Z be a standard Normal variable, i.e., $Z \sim N(0, 1)$, and X be a Normal variable with mean $\mu = 3$ and variance $\sigma^2 = 25$, i.e., $X \sim N(3, 5^2)$. Determine the following:

(5 Points each)

1. $P(Z < -0.54) =$

2. $P(X < -0.54) =$

3. $P(-2.0 < Z < 1.5) =$

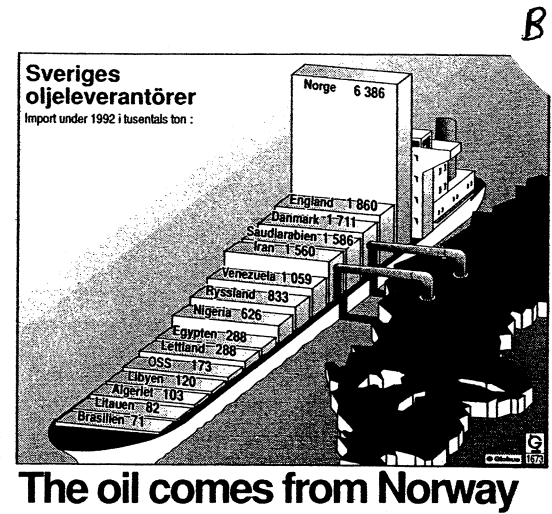
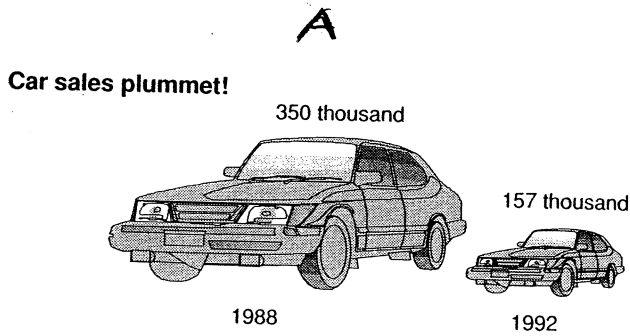
4. $P(-2.0 < X < 1.5) =$

5. Find a number # such that
 $P(Z > \#) = 0.60$

6. Find a number # such that
 $P(X > \#) = 0.60$

Question 3: Newspaper Graphics (40 Points)

The following two graphics have been taken from Wallgren et al. (1996) "Graphing Statistics & Data".



1. For each of the two graphics, determine if there is something wrong with it. If so, carefully explain what is wrong. (30 Points)

Graphic A:

Graphic B:

2. For each of the graphics from part (1) above that contains something wrong, draw a sketch how a corrected graphic should look like. **(10 Points)**

Graphic A:

Graphic B:

Question 4: Micromaps (50 Points)

The 2 micromap displays on the next 2 pages have been taken from the U.S. Department of Agriculture, National Agricultural Statistics Service (Research and Development Division) Web site at

<http://www.nass.usda.gov/research/gmcrnyap.htm>

and

<http://www.nass.usda.gov/research/gmcrnapy.htm>.

In map A, the states have been arranged from highest to lowest “Acreage” (in millions of acres) and in map B, the states have been arranged from highest to lowest “Yield” (in bushels per acre). Please answer the following questions:

1. Describe each of the 2 micromap displays (in **5 sentences or less**) with respect to the variable by which the states have been sorted. **(25 Points)**

Map A (by Acreage):

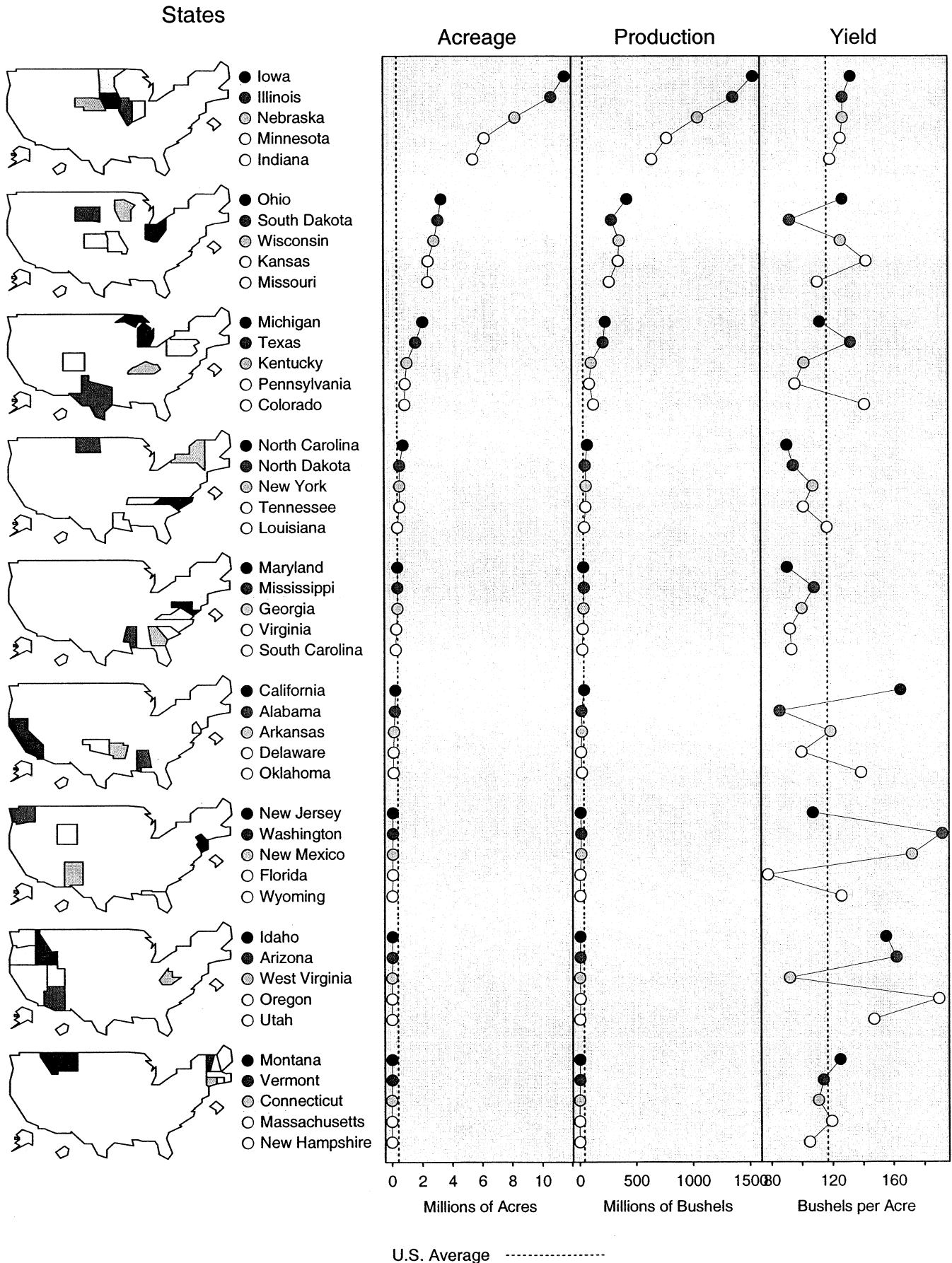
Map B (by Yield):

2. Recall how we described the relationship between “Average HAP” and “% Urban Census Tracts” for the “Hazardous Air Pollutants” micromap discussed in class. Now make similar statements (if possible) regarding the relationship between “Acreage” and “Production” as well as “Acreage” and “Yield”. **(25 Points)**

“Acreage” and “Production”:

“Acreage” and “Yield”:

A: Corn Statistics by State, 1997 Census of Agriculture



B: Corn Statistics by State, 1997 Census of Agriculture

