HOMEWORK 2

STA 321, Basic Statistical Analysis
Spring Semester, 2014

Due: Feb 6th 2014

This week, the homework consists of six problems about scales of measurement and methods of collecting data.

1 Look at a few recent issues of journals in your field and find some examples of descriptive statistics. For one example, identify the variables used and their scales of measurement. Please provide the exact references.

2 Explain the difference between
(a) qualitative and quantitative variables, and
(b) between nominal and ordinal variables.
(c) Why do these distinctions matter for statistical analysis?

3 Which scale of measurement is most appropriate for each of the following variables? Are these variables discrete or continuous?
(a) Nationality (American, Chinese, Brazilian, German, Indian, Serbian).
(b) Shoe size $(5, 5.5, 6, 6.5, ..., 12, 12.5, 13, 13.5, 14)$.
(c) Favorite music group.
(d) Midterm exam score in STA570 (in percent).
(e) Statewide murder rate (number of murders per 1,000 people).
(f) Community size (rural, small town, large town, small city, large city).
(g) Annual income (in $1,000 per year).
(h) Airline seat (economy class, business class, first class).

4 You are assigned to direct a study on your campus to determine the factors that relate to first-year student retention.
(a) Describe how you might select a sample of 100 students for the study.
(b) List some variables that you would measure in your study. For each, provide the scale of measurement.

5 A polling organization asked, "Should laws be passed to eliminate all possibilities of special interests giving huge sums of money to candidates?", and 80% of the respondents answered "yes". However, only 40% answered "yes" to the following question: "Should laws be passed to prohibit interest groups from contributing to campaigns, or do groups have a right to contribute to the candidate they support?" Explain the problem illustrated by this example. Is this an example of sampling error or non-sampling error?

6 Does cell phone use increase the probability of cancer? Find studies that try to answer this question. For one of them, determine whether it was observational or experimental. Discuss any limitations that the study may have, and point out good use of statistics if you find some. Please provide the exact references.