Social Studies 201
Winter 2001
Answers to Problem Set No. 1

January 22, 2001

1. **Question**. Attached are photocopies of two articles concerning crime rates. Write a paragraph or two commenting on any issues or problems you note concerning the data in the articles. Note any questions you might have concerning the meaning, source, or quality of these data. Attempt to use some of the issues raised in Chapter 2 of the text concerning production of data, but do not feel restricted to using only the issues in the text.

   Answer. Some of the issues and questions that could be raised with respect to these articles are as follows.

   - The definition of each of the types of crime would need to be examined and clarified in each case. For example, exactly what is meant by the terms "sexual assault," "robbery," or "criminal harrassment and stalking" would need to be clarified. These may seem fairly clear cut, but any researcher working with these data would need to define or clarify the definition of each of these.

   - With respect to the article on murder rates, there are two terms used, "murder" and "homicide." These are very similar concepts, but the exact definition of each may differ somewhat. Further, the legal definition of these may differ from what most lay people would consider a murder.

   - Mike Badham's argument that "drug and alcohol addictions are at the root of much of Regina's property crimes" would need more evidence than provided in the article from *The Leader-Post*. This may be correct, although exactly what "addiction" means and whether these are the real cause of property crime would need a careful investigation.

   - The note at the end of the bullets in *The Leader-Post* is interesting, in that it accords recognition to the fact that the data may be driven by the level of enforcement. With crime statistics, this is

generally a problem. The data in crime statistics usually reflect the number of crimes that have been reported to the police or are known to the police. That is, the measurement of crime rates may be dependent on the number of police, the trust people have in police, and how members of the public report these matters to the police. As a result, changes in crime rates across time and comparisons across cities have to be carried out very carefully. The last part of the article notes that increases in the numbers of dangerous and impaired driving crimes are very closely related to increased enforcement.

This is a good example of how data are produced by a public agency – in this case, the police. The data do not just represent what occurs, but depend on how the agency decides to enforce the law.

- In the article on murders, a number of populations nees to be defined. The article makes reference to "child," "stranger," and "aboriginal person" and while the reader generally understands what these mean, a researcher would have to carefully define each of these populations. A similar issue would be what is a "gang-related homicide."

- The last paragraph on Saskatchewan is encouraging, in that the number of murders has declined dramatically. But note that this is just a comparison of two years, 1998 and 1999. When dealing with incidents that are relatively unusual, such as the number of murders, the actual number can vary a lot from year to year. It may be that the number will be up again in 2000 and 2001. In any case, when looking at the annual numbers of murders, it is always wise to look at the trend over several years, rather than just from one year to the next.

2. Use the questionnaire from the *Survey of Student Attitudes and Experiences Fall 1998* conducted by Social Studies 306 students in the Fall 1998 semester for this question. For each of questions 15, 26, 41, 44, and 49 in the Survey, (i) clearly identify the variable in each question. In each case (ii) explain what level of measurement the variable has (nominal, ordinal, interval or ratio). Also explain (iii) whether the

variable is discrete or continuous.

Answer.

- **Question 15**. There are several questions here, but the variable in each case is the **respondent's view or opinion** concerning the issue or statement. These are all measured at the **ordinal** level, since the views or opinions are ranked from strong disagreement to strong agreement, but the distance or interval between each category is not well defined. Each of the views or opinions of respondents might be considered to vary continuously, although for purposes of the survey, these views or opinions are organized into a discrete set of categories (1 through 5).

- **Question 26**. Here the variable is the **main source of knowledge concerning multiculturalism**. This variable is measured at no more than the **nominal** scale, since only the main source is requested, and there is no ranking of the different sources. This would generally be considered to be a **discrete** variable, because the number of possible sources can be counted.

- **Question 41**. The variable is **importance of religious or spiritual values** and this is measured at the **ordinal** level in this question. That is, the categories of response are ordered as less than or greater than in terms of importance. As with question 15, this characteristic potentially varies in a continuous manner, but the responses are organized into only a discrete number of possible categories.

- **Question 44**. The variable here is **grade** or average grade, in Grade 12 and in University. Grades are ordinarily considered to be measured on at least an **interval** scale, with a well defined unit of a percentage point, and equal numerical differences between grades representing equal magnitudes of grades. Since a grade of 0 really means 0, grades may also be considered to be measured at the **ratio** level, so that meaningful ratios of grades can be determined. Grades may be considered to be measured on a **continuous** scale, although they are usually rounded to the nearest integer.

- **Question 49**. The variable is **amount of student debt** and since this is measured in dollars, this is an **interval** and **ratio**

scale that is **continuous**.

3. **Question**. Construct a stem and leaf display for the data in Table 1. These data come from a random sample of 61 undergraduate student respondents to the Fall 1998 Survey. Present the unordered and the ordered stem and leaf display. From these construct and present a table of the frequency distribution and a histogram. Describe in a sentence or two.

   Answer. The unordered and ordered stem and leaf displays are in Tables 2 and 3, the frequency distribution table in Table 4, and the histogram in Firgure 1.

   The distribution of hours worked shows that most students in this sample work less than 40 hours per week, with 10-19 and 20-29 hours per week being most common. There are only 2 out of 61 in the sample who work more than 40 hours per week.

Table 1: Number of Weekly Hours Worked at Jobs for for a Random Sample of 61 Respondents from the Survey of Student Attitudes and Experiences, Fall 1998

16	16	18	24	18	30
28	12	10	20	18	40
22	10	5	25	20	35
18	25	25	11	30	3
30	20	30	20	16	16
5	10	4	5	2	15
32	25	40	8	20	23
20	10	13	50	25	20
17	23	15	12	15	8
100	20	45	30	10	40
	4				

Table 2: Unordered Stem and Leaf Display

```
 0 | 5  4  5  4  5  8  2  3  8
 1 | 6  8  7  6  2  0  0  0  8  0  3  5  1  2  8  8  6  5  0  6  5
 2 | 8  2  0  5  0  5  3  0  5  4  0  5  0  0  0  5  3  0
 3 | 0  2  0  0  0  0  5
 4 | 0  5  0  0
 5 | 0
 6 |
 7 |
 8 |
 9 |
10 | 0
```

Table 3: Ordered Stem and Leaf Display

```
 0 | 2  3  4  4  5  5  5  5  8
 1 | 0  0  0  0  0  1  2  2  3  5  5  5  6  6  6  6  7  8  8  8  8
 2 | 0  0  0  0  0  0  0  0  2  3  3  4  5  5  5  5  5  8
 3 | 0  0  0  0  0  2  5
 4 | 0  0  0  5
 5 | 0
 6 |
 7 |
 8 |
 9 |
10 | 0
```

Table 4: Distribution of Weekly Hours Worked, 61 University of Regina Undergraduates, Fall, 1998

Weekly Hours of Work	Real Class Limits	f
0-9	-0.5-9.5	9
10-19	9.5-19.5	21
20-29	19.5-29.5	18
30-39	29.5-39.5	7
40-49	39.5-49.5	4
50-59	49.5-59.5	1
60-69	59.5-69.5	0
70-79	69.5-79.5	0
80-89	79.5-89.5	0
90-99	89.5-99.5	0
100-109	99.5-109.5	1
Total		61

Figure 1

Histogram of Income Distribution
60 Saskatchewan Households, 1994