Economics 224 – 001/002 – Assignment 2

Due by 12:00 p.m. (noon), Friday, October 3, in the Department of Economics office, CL241. Assignments will be accepted after that until noon Monday, October 6 with a 20% reduction in grade; after that assignments will not receive a grade.

1. (5 points). For each of the following quotes, identify the type of probability (classical, frequency, subjective) that appears to be associated with the word in bold letters. In a sentence or two, explain your reasoning. In the case of quote B, also explain in a couple sentences how the concepts of independence or dependence may be involved.

A. Soon after he took office as Premier of Saskatchewan, a commentator said about the Premier, "Mr. Wall did offer some specifics. He'll **probably** announce that he won't sell any Crown corporations, he said." Source: *The Globe and Mail*, March 15, 2004, p. A7.

B. On average, 16% of employees felt that poor interpersonal relations were a source of stress at work. This compares with about 10% of primary industry workers and 21% of workers in health occupations who feel this way. The **likelihood** of feeling stressed at work as a result of poor interpersonal relationships did not vary significantly from the average in most occupations.
Source: Cara Williams, "Stress at work," *Canadian Social Trends*, No. 70, Autumn 2003, p. 10.

2. (20 points). The attached Excel file has data on six variables from the Economics 224 Survey, gender and the five opinions at the end of the survey. For this question, use *gender* and *legal*, with the numbers for the latter being the responses to question 17, "Should marijuana be legalized, and treated like alcohol?" The numerical responses are 1 (strong no), 2 (weak no), 3 (indifferent), 4 (weak yes), and 5 (strong yes).

a. Organize the data on *gender* and *legal* as a tree diagram, with *gender* being the first stage and *legal* being the second stage. On the tree diagram provide the number of respondents with each characteristic.
b. Using the tree diagram, what are the following probabilities?
    i. Response of *indifferent*.
    ii. Response of *yes*.
    iii. Response of *male* and *no*.
    iv. Conditional probability of *no* given *female*.
c. Now reorganize the same data into a cross-classification table, with *gender* in the columns and *legal* in the rows. Use the data in the table to obtain the following probabilities.
    i. Response of *male* or *weak no*.
    ii. Conditional probability of *yes* given *female*.
    iii. Conditional probability of *Male* given *no*.
    iv. For each of the following two pairs of events, "*male* and *indifferent*" and "*female* and *weak yes*" are the events independent or dependent? (Report the probabilities used to answer this).
d. From the tree diagram and table, and the results in a. through c., in a few sentences explain how responses to the opinion question on legalization of marijuana differ or are the same by gender.

3. (10 points). Again use the Excel data set, this time analyzing the last column *DrinkAge*, the responses to question 19 "How old should a person be in order to drink alcohol?" Responses range from 16 to 21 years. Construct a probability distribution for the random variable *DrinkAge*. Using this distribution, obtain the expected value, variance, and standard deviation for *DrinkAge*. From this distribution, what is the probability that a randomly selected case is within one standard deviation of the mean? Within two standard deviations of the mean?

4. (10 points). ASW, page 209, #35. (page 208 in fourth edition).

5. (15 points). Use the attached Table 1, along with the two histograms with the normal curve superimposed, for this question.

a. For this part of the question, use the means and standard deviations for those aged 15-24 and 35-44 years, but round them to the nearest dollar. If the distribution of hours worked for each of these two age groups was normally distributed, how many individuals would there be in each of the categories of hours worked in Table 1?

b. In a short paragraph, compare the results in a. with the actual results from the sample in Table 1. That is, comment on similarities and differences between the actual distribution of hours worked and what would be expected if the distributions of hours worked were exactly normal.

c. Suppose a random sample of six workers is selected from the group of all 2,486 workers in the sample. Treating this as a large population, use the binomial probability distribution to obtain the probability that exactly 4 of these worked less than or equal to 1,250 hours? That 4 or more worked less than or equal to 1,250 hours? (Use either the Excel spreadsheet or obtain with the assistance of the formula and calculator).

If any questions, send me an email at paul.gingrich@uregina.ca and I will attempt to respond within a day.

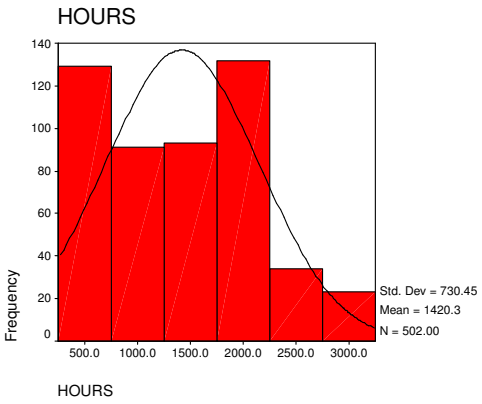
Gender	Low Tuit.	High Tuit.	Legal	Download	DrinkAge
Female	5	1	5	1	18
Male	5	3	1	2	19
Male	3	2	3	5	18
Male	5	3	2	1	18
Female	4	3	3	3	18
Male	2	1	2	4	18

Male	3	3	3	3	19
Female	5	1	2	3	21
Male	4	3	5	4	19
Male	1	5	5	3	18
Male	2	2	4	4	18
Female	3	3	1	2	18
Female	4	3	1	3	18
Male	5	1	3	3	21
Female	5	2	4	1	18
Male	3	3	2	4	19
Male	5	1	5	1	21
Male	5	1	3	1	18
Female	3	3	5	3	19
Female	4	3	1	3	20
Female	5	2	1	3	19
Female	3	2	5	4	20
Female	4	2	1	3	16
Female	1	4	5	3	18
Male	4	2	1	3	18
Female	5	2	4	2	18
Male	5	2	3	4	18
Female	5	1	4	3	18
Female	5	1	2	2	20
Male	5	1	3	5	16
Female	3	3	2	2	18
Female	2	3	2	2	19
Male	5	1	4	1	19
Male	5	1	2	2	16
Male	4	1	1	1	21
Male	5	1	3	3	18
Male	3	4	4	1	18
Female	5	3	3	3	19
Male	4	2	4	2	18
Female	3	2	2	4	21
Male	2	5	3	2	21
Male	5	3	3	5	19
Male	5	4	1	4	20
Male	2	1	1	1	21
Male	3	3	2	2	16

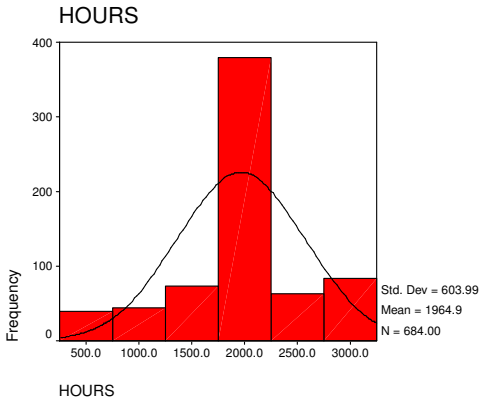
Table 1. Annual hours worked at jobs by Saskatchewan respondents of different ages

Annual hours worked at jobs	X (hours in thousands of hours)	Number of respondents by age		
		All ages	Ages 15-24	Ages 35-44
250-750	0.5	264	129	39
750-1,250	1.0	259	91	44
1,250-1,750	1.5	340	93	74
1,750-2,250	2.0	1,134	132	380
2,250-2,750	2.5	232	34	63
2,750 plus	3.0	257	23	84
Total		2,486	502	684

Ages 15-24



Ages 35-44



Source: Statistics Canada. Survey of Labour and Income Dynamics (SLID), 1999: Person file [machine readable data file]. Release 1 Edition. Ottawa, ON: Statistics Canada. 4/16/2003.