How People Learn, Exercises Week 5

Question 1

So far the exercises have (mostly) looked at situations when you have only one variable to work with and when you want to either (a) describe the variable (graphically or in numbers) or (b) make inferences about this variable in a population. This first exercise is designed to help you review what the exercises have covered so far and to organize the different tools you have used.

Complete the following table, using the list of statistical tools provided below. For the inferential statistics, note any major restrictions/conditions on their use.

One sample z-test, one sample t-test, Bar chart, Frequency table, Pie chart, Histogram, Box plot, mean, median, mode, stem and leaf plot, test of proportion.

Number of variables	**What do you want to do?**	**What is the nature of the data?**	**List appropriate tools**	**Notes on conditions of their use**
Working with a single variable	Describing the variable graphically	Nominal		
		Ordinal		
		Interval		
	Describing the variable in numbers	Nominal		
		Ordinal		
		Interval		
	Making inferences about the population	Nominal/ordinal		
		Interval data sample size of <25		
		Interval data sample size of >=25		

Question 2

Now taking variables two at a time (categorical X categorical data)…

(a)

The question in the Self-regulation questionnaire that has the strongest correlation with academic attainment is Question 8 (which we have already reversed because it had a negative orientation compared to other questions). It will be interesting therefore to test whether question 8 is independent from or associated with faculty of origin. Note that question 8 is an ordinal variable and faculty of origin is nominal data.

First, produce a cross tabulation for faculty of origin (independent variable) and question 8 (dependent variable). Include only students in STI and IC in the analysis. Remember to include a table number, title, totals, category labels and a note to explain missing data.

(b)

Using this data produce a stacked bar chart. Remember to include chart number, chart title and appropriate axis titles, a legend, and a note to explain missing data.

Question 3

(a)

Using the cross tab produced in question 2 it is not possible to do a Chi-square test to test if the two variables ('faculty' and 'score on Q.8') are independent. Why?

(b)

Recode Question 8 into two categories called "low scores" (made up of 1 and 2) and "high scores" (3,4, and 5).

Now a Chi-square test is possible. Test the null hypothesis that faculty of origin and score on Question 8 are independent. What do you conclude from your results?