Stat261 - Spring 2018
Assignment #4 - due Monday, March 12, 2018 in class
Neatly hand write your solutions - marks will be assigned for presentation

1. In an experiment on human behaviour, a sociologist asks four men and four women to enter a room and sit wherever they wish at a rectangular table. There are three chairs at each side of the table and one at each end. The two end seats are considered to be special in that people sitting there have more dominant positions at the table.

   The seating experiment is repeated 28 times using new subjects each time. The following table shows the numbers of times that the two end seats were occupied by two men, by two women and by a man and a woman.

   Using a Likelihood ratio test, test the hypothesis that the probabilities for the three classes are: 3/14, 3/14 and 8/14.

Occupants of end seats	MM	FF	MF or FM	Total
Observed frequency	9	4	15	28

2. A seed dealer claims that his sweet pea seeds have a germination rate of 80%. A customer purchased 4 packages of sweet pea seeds, one package of each of four colours. He planted 100 seeds from each package. The number of seeds germinating within one month were as follows:

	Red	White	Blue	Yellow
Germination	76	66	81	74
No germination	24	34	19	26

   (a) Using a Likelihood Ratio Test, test the hypothesis that the germination rate is 80% for all four of the colours.

   (b) Using a Likelihood Ratio Test, test the hypothesis that the germination rate is the same for all four colours, but not necessarily 80%.

3. Six hundred and four adult patients in a large hospital were classified according to whether or not they had cancer, and according to whether or not they were smokers. The results were are given below.

   Using a Likelihood Ratio Test, test the hypothesis that the disease classification is independent of the smoking classification.

	Cancer patient	Other
Smoker	72	397
Non-smoker	10	125