Homework 6: Due Wednesday 23rd of March

Note: Please do all calculations by hand. You should not need R to do any of these calculations.

1. Jeff wishes to test his ability to his ability to hunt deadly drop bears under varying levels of intoxication. Over 9 nights, at 3 differing levels of intoxication: 'drunk', 'very drunk' and 'plastered' Jeff goes out hunting and notes down how many drop bears he managed to 'snag'. Assume that our observations come from a normal distribution with equal variance σ^2.

'drunk'	7	4	9
'very drunk'	3	2	4
'plastered'	2	3	2

    (a) Construct the ANOVA table.

    (b) Give an estimate for the variance σ^2.

    (c) Test whether there is a difference between Jeff's ability to hunt when he is 'very drunk' compared to 'plastered'.

    (d) Stating clearly the hypotheses, test whether or not Jeff's intoxication level has an impact on his ability to hunt.

2. Independent samples of X_1, X_2 and X_3 were obtained. We assume that $X_i \overset{d}{=} N(\mu_i, \sigma^2)$ and the data is as follows:

	number in each group	average of group
X_1	10	4.23
X_2	5	4.42
X_3	5	4.94

    (a) Given the total SS is 4.07, construct the ANOVA table.

    (b) Test the hypothesis $H_0 : \mu_1 = \mu_2 = \mu_3$.

    (c) Give an estimate for μ_3 and a 95% confidence interval for it.

3. Problems from the textbook: 7.3.1, 7.4.3, 7.4.4, 7.4.9, 7.5.1, 7.5.3, 7.5.5.