Math/STAT 319 Homework 11 Due Apr. 19 (The last homework! Cheers!)

1. Ex 11.3 In a study to assess the effects of malaria infection on mosquito hosts (Plasmodium cynomolgi: Effects of Malaria Infection on Laboratory Flight Performance of Anopheles stephensi Mosquitos, Exp. Parasitol., 1977: 397C404),mosquitoes were fed on either infective or noninfective rhesus monkeys. Subsequently the distance they flew during a 24-h period was measured using a flight mill. The mosquitoes were divided into four groups of eight mosquitoes each: infective rhesus and sporozites present (IRS), infective rhesus and oocysts present (IRD), infective rhesus and no infection developed (IRN), and noninfective (C). The summary data values are $\bar{x}_{1\cdot} = 4.39$ (IRS), $\bar{x}_{2\cdot} = 4.52$ (IRD), $\bar{x}_{3\cdot} = 5.49$ (IRN), $\bar{x}_{4\cdot} = 6.36$ (C), $\bar{x}_{\cdot\,\mathrm{cot}} = 5.19$, and $\sum\sum x_{ij}^2 = 911.91$. Use the ANOVA test at leve 0.05 to decide whether there are any differences between true average flight times for the four treatments.

2. Ex11.8 Six samples of each of four types of cereal grain grown in a certain region were analyzed to determine thiamin content, resulting in the following data (mg/g):

   - Wheat 5.2 4.5 6.0 6.1 6.7 5.8
   - Barley 6.5 8.0 6.1 7.5 5.9 5.6
   - Maize 5.8 4.7 6.4 4.9 6.0 5.2
   - Oats 8.3 6.1 7.8 7.0 5.5 7.2

   Test to see if at least two of the grains differ with respect to true average thiamin content. Use an $\alpha = 0.05$ test based on the P-value method.

3. Ex 11.6 (extra credit) In an experiment to investigate the performance of four different brands of spark plugs intended for use on a 125-cc two-stroke motorcycle, five plugs of each brand were tested for the number of miles (at a constant speed) until failure. The partial ANOVA table for the data is given here. Fill in the missing entries, state the relevant hypotheses, and carry out a test by obtaining as much information as you can about the P-value.

Source	df	Sum of squares	Mean square	f
Brand				
Error			14,713.69	
Total		310,500.76		