

# STAT 516 - Spring 2002 - Homework 5

Due: Thursday, March 28th

1) (4 points) A continuation of problem 4 from Homework 5.

a) Use the Holm test with a family-wise  $\alpha$ -level of 0.05 to test all of the pair-wise differences, and construct a display of the results.

b) Use a contrast to make a 95% confidence interval for the difference between the average of the Blondes and the average of the Brunettes.

2) (6 points)

		Treatment				
	1	2	3	4	5	
	11.4	14.5	12.3	13.9	8.5	
	10.0	14.5	12.9	16.1	9.9	
	10.5	13.3	11.1	14.1	6.7	
	10.6	14.8	12.4	13.7	7.5	
	10.7	14.1	11.6	14.9	6.7	

a) For the data given above, check that the assumptions that we can check from the residual plots are true for performing a one-way ANOVA.

For each of b and c, state why you believe the assumption that errors are independent will be met. Then, decide on the appropriate analysis (ANOVA table, Holm test, or Contrasts). Finally, conduct that analysis using  $\alpha_T=0.05$  and state your conclusion. (2 points each)

b) The data are the test scores of a sample of students randomly assigned to five sections of a class taught by five different instructors (the treatments). If an award is to be given to the instructor(s) who best prepared their students, which one(s) should win?

c) The data are the miles per gallon that resulted from a fleet of test cars using different gasoline additives (the treatments). The 25 cars and drivers were randomly assigned to the five:

- 1=Additive type A, made by manufacturer 1
- 2=Additive type B, made by manufacturer 1
- 3=Additive type A, made by manufacturer 2
- 4=Additive type B, made by manufacturer 2
- 5=no additive

It is desired to compare the affect of using an additive to using no additive, to compare manufacturer 1 to manufacturer 2, and to compare type A to type B.