

STA 6246 - Homework No. 5, Fall, 2003  
 Due Wednesday, December 3  
 Submit the following problem.

**Problem**

A researcher wanted to study the effects of 3 different fats and 3 different additives on the specific volume of bread loaves. The following data were obtained:

		B=Additive		
		1	2	3
A=Fat	1	6.7	7.1	
		4.3	5.9	
		5.7	5.6	
	2	5.9		6.4
		7.4		5.1
		7.1		6.2
	3	7.1	7.3	7.5
		5.9	6.6	9.1
			8.1	6.8

1. Establish the hypothesis tested by  $F(\alpha\beta|\mu, \alpha, \beta)$ . Is the test conclusive at the  $\alpha = 0.05$  level?
2. Find the values of the test statistics for testing  $H_1, H_2, H_3, H_4, H_6,$  and  $H_7$ .
3. Give a Type 4 hypothesis for factor A.
4. Which least-squares means for A and B are estimable? Give estimates of those that are estimable.