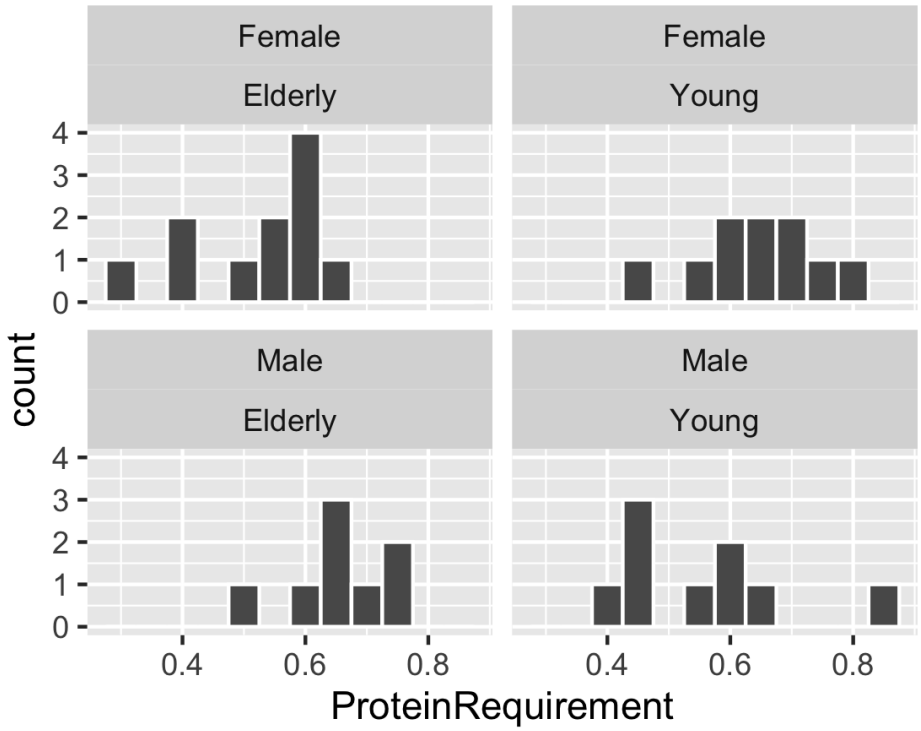
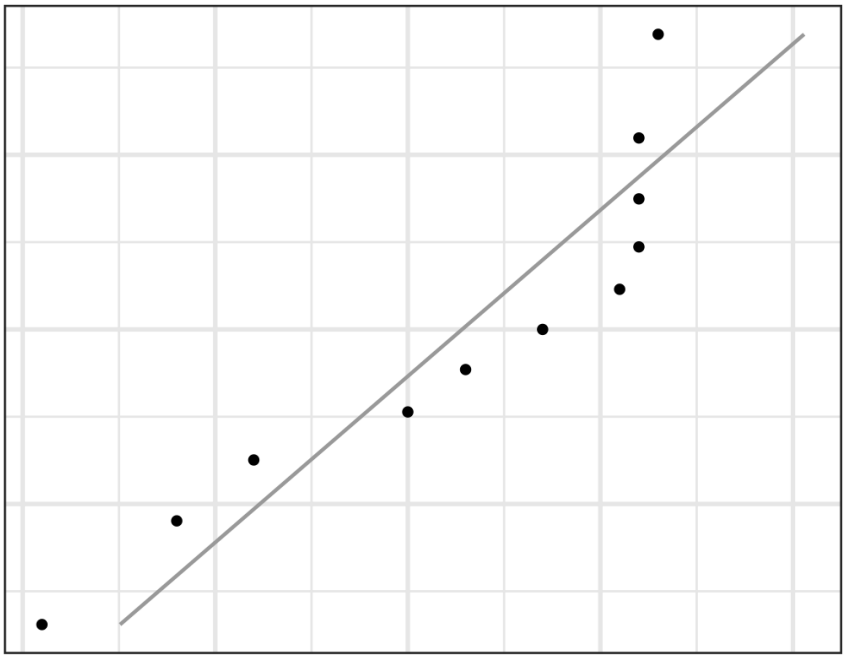
Lesson 14: Inference for Several Means (ANOVA)

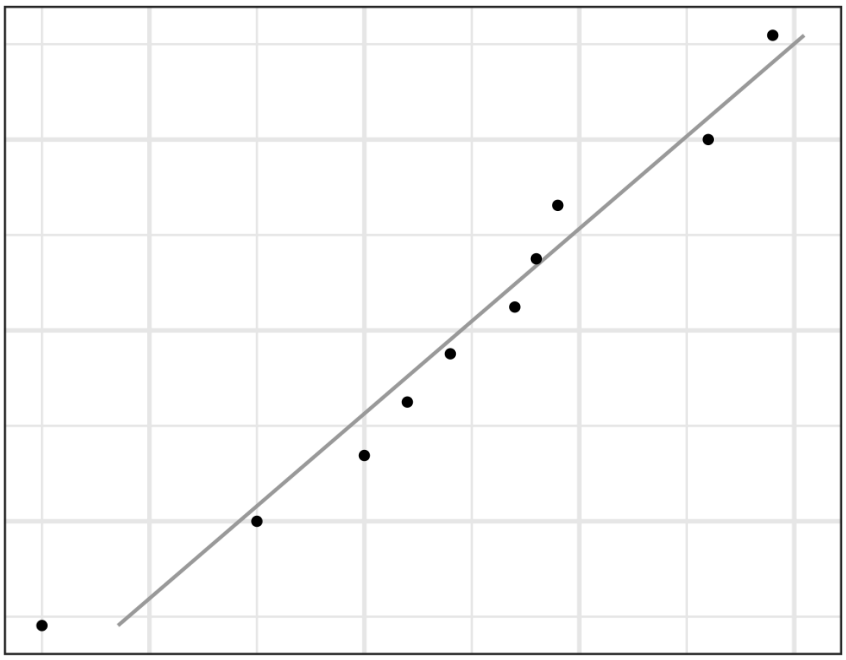
Homework

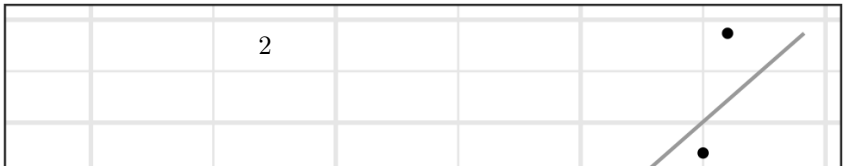
Solutions

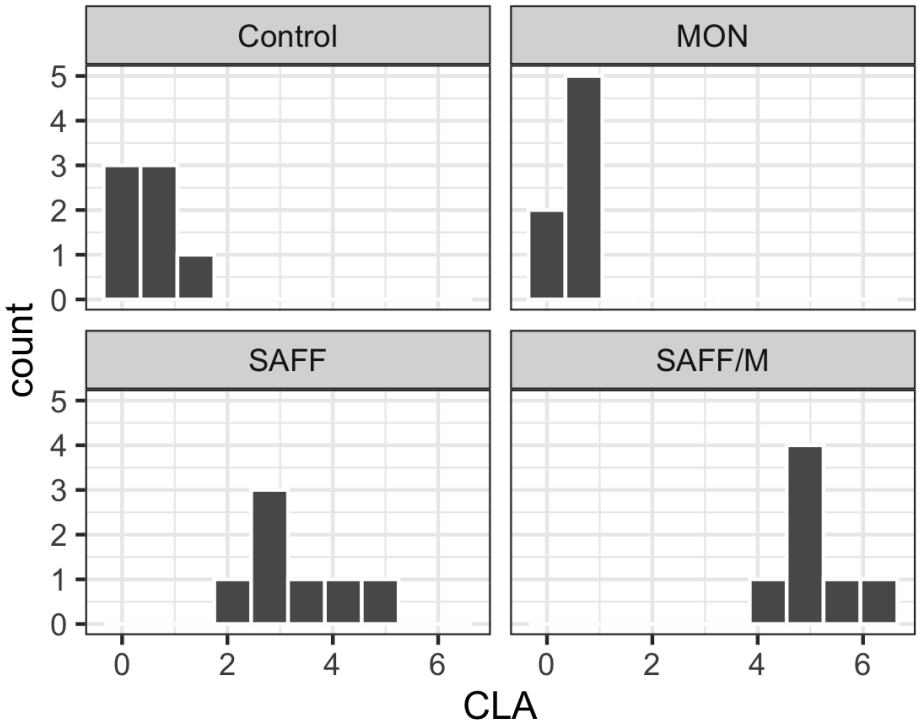
Problem	Part	Solution
1	-	ANOVA is a test for equality of several means. It allows us to compare the means for several groups in one hypothesis test.
2	-	a. An F-distribution is right skewed. A t-distribution is bell-shaped. b. The values of F are never negative. The values of t can be positive or negative. c. The P-value for the ANOVA test is always the area in the right tail in an F-distribution. We will never divide the area in the tail. The P-value for a t-test can be either the area under the right tail, the left tail, or both.
		
3	-	
4	-	**Elderly Females**: n = 11, mean = 0.528, Std. Dev. = 0.112 **Young Females**: n = 10, mean = 0.645, Std. Dev. = 0.099 **Elderly Males**: n = 8, mean = 0.654, Std. Dev. = 0.092 **Young Males**: n = 9, mean = 0.558, Std. Dev. = 0.145
5	-	ANOVA

Problem	Part	Solution
6	-	Yes, the requirements are satisfied. The requirements that were checked were the following: -The observations are normally distributed within each group. This was checked by creating Q-Q plots for each group. The sample sizes are small and this conclusion is subjective.

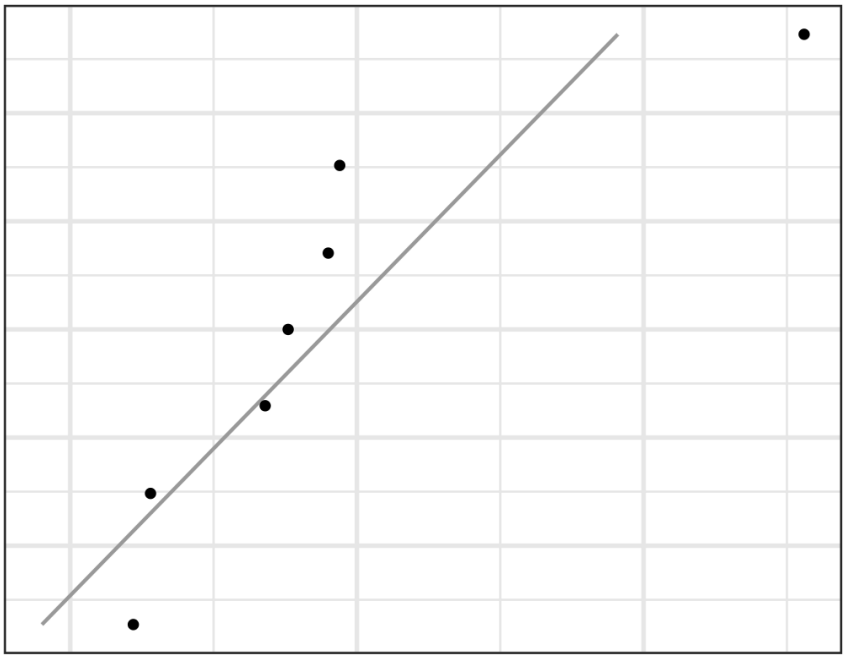


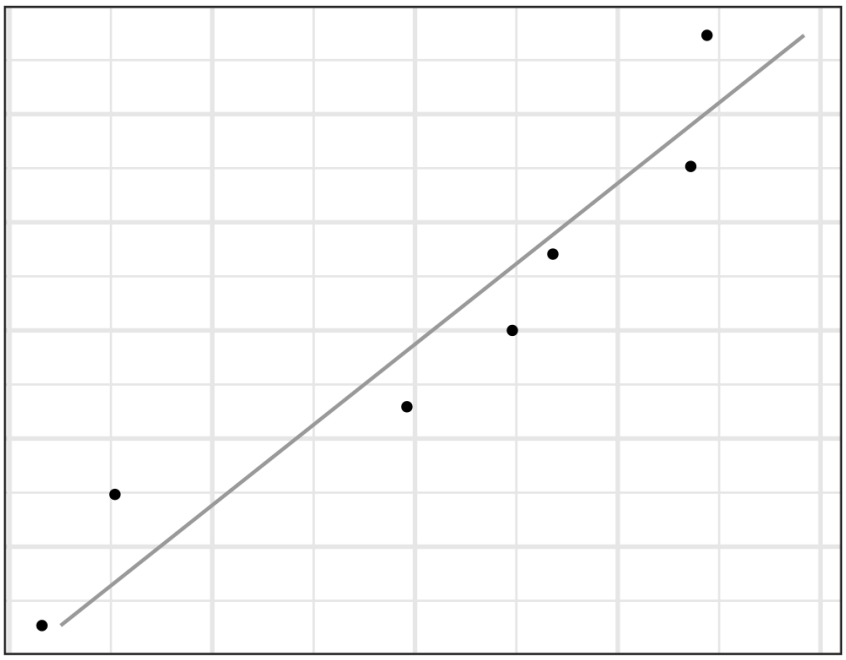


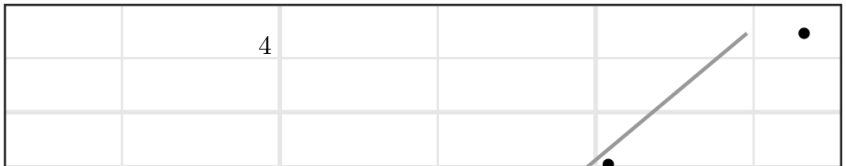


Problem	Part	Solution
7	-	H_0 : All the means are equal H_a : At least one of the means differs
8	-	F = 2.932 df = 3 and 34
9	-	P-value = 0.047
10	-	P-value = $0.047 < 0.05 = \alpha$ reject the null hypothesis
11	-	There is sufficient evidence to suggest that there is a difference in the mean protein requirements of the individuals in the four groups.
		
12	-	
13	-	**Control**: n = 7, mean = 0.453, Std. Dev. = 0.391 **MON**: n = 7, mean = 0.521, Std. Dev. = 0.325 **SAFF**: n = 7, mean = 3.363, Std. Dev. = 0.774 **SAFF/MON**: n = 7, mean = 5.151, Std. Dev. = 0.729

Problem	Part	Solution
14	-	No, not all of the requirements are satisfied. The requirements that were checked were the following: -The observations are normally distributed within each group. This was checked by creating Q-Q plots for each group. The sample sizes are small and this conclusion is subjective.







Problem	Part	Solution
15	-	H_0 : All the means are equal H_a : At least one of the means differs
16	-	F = 106.217 df = 3 and 24
17	-	P-value = 0
18	-	P-value = $0 < 0.05 = \alpha$ reject the null hypothesis
19	-	There is sufficient evidence to suggest that there is a difference in the mean CLA content in milk fat for at least one of the four diets.
20	-	It would be worth figuring out which of the diets produced the highest CLA content and then possibly encouraging the use of that diet more than the others.