CHAPTER 6. ANALYSIS OF VARIANCE (ONE-WAY)

6.1. What is "Analysis of variance" (ANOVA)?

6.2. One-Way Analysis of Variance

6.3. The Least significant difference intervals

6.4. The p-value

Chapter 6: Assignments

1. **We want to investigate if there is an effect of the type of fertilizer applied to apple trees and the production of apples. We randomly select 15 trees and randomly assign them to one of three groups (5 trees per group). We perform a test in which we apply one type of fertilizer (fertilizer 1, 2 or 3) to each group. The data are shown. At a a=0.05, can it be concluded that there is a significant difference in the production of apples depending on which fertilizer is used? Which fertilizer/fertilizers causes a higher/lower production than the other/others?**

Fertilizer 1	Fertilizer 2	Fertilizer 3
10	6	5
12	8	9
9	3	12
15	0	8
13	2	4

- So, first, we will start by taking 15 trees, because this is an important value. Whereas if we look forward, then we can see that the data which are shown in this case are a=0,05.
- The first step towards calculating, is to take the mean of all the fertilizers.
- According to the calculations done in the pdf-file, then we can see that the F-ratio is bigger than the F-table.
- From our calculations, we can conclude that the fertilizers from 1 have a higher production compared with fertilizers 2 and 3.

2. We want to evaluate three different methods to lower the blood pressure of individuals that have been diagnosed with high blood pressure. Eighteen subjects are randomly assigned to three groups (6 per group): the first group takes medication, the second group exercises, and the third one follows a specific diet. After four weeks, the reduction in each person's blood pressure is recorded. Is there a significant difference among the reduction obtained from each of the three methods? If yes, which method was more effective?

Medication	Exercise	Diet
12	5	6
8	9	10
11	2	5
17	0	9
16	1	8
15	3	6

- In this case we can see that there is a significant difference between the groups. For instance we can see according to the lower and upper minute, that the medication is much more effective than the others as it has a higher (upper and lower interval).

3. In the table below, there are randomly selected scores for eight amateur basketball teams in each of five Danish regions, for a particular weekend. Is there sufficient evidence to support that there is a difference in mean scores by region? If yes, which region/s got the highest scores and which one the lowest?

Region Hovedstaden	Region Sj lland	Region Syddanmark	Region Midtjylland	Region Nordjylland
68	78	89	62	57
75	79	87	74	65
95	65	75	71	78
85	67	65	70	88
84	60	84	72	67
88	79	92	72	77
85	57	84	64	72
75	74	72	75	69

- It can be concluded that there is a significant difference in a= 0,05. According to our calculations, we can see that Region Hovedstad and Region Syddanmark are the ones which have higher and almost same scores in basketballs. Whereas if we look at Midtjylland, Nordjylland and Sjælland have almost the same lower-scores.
- Look at the beautiful Ark 6.