Homework 6 - AGST 5014

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1. With the data set below, answer: (another resource on IBD: Chapter 14 - http://users.stat.umn.edu/~gary/book/fcdae.pdf) a) Is this a balanced or partially balanced design?

```
data("taste", package = "daewr")
str(taste)
```

```
## 'data.frame':    24 obs. of  3 variables:
##  $ panelist: Factor w/ 12 levels "1","2","3","4",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $ recipe  : Factor w/ 4 levels "A","B","C","D": 1 1 1 2 2 3 1 1 1 2 ...
##  $ score   : num  5 7 5 6 6 8 6 5 4 7 ...
```

```
table(taste$panelist)
```

```
##
##  1  2  3  4  5  6  7  8  9 10 11 12
##  2  2  2  2  2  2  2  2  2  2  2  2
```

We have 12 different panelists, and each one gave 2 scores only.
Each panelist is a block.

```
table(taste$recipe)
```

```
##
## A B C D
## 6 6 6 6
```

We have 4 different recipes, and each one was tasted 6 times.

```
tab <- with(taste, table(panelist, recipe))
tab
```

```
##         recipe
## panelist A B C D
##       1  1 1 0 0
##       2  1 0 1 0
##       3  1 0 0 1
##       4  0 1 1 0
##       5  0 1 0 1
##       6  0 0 1 1
```

```
##       7  1 1 0 0
##       8  1 0 1 0
##       9  1 0 0 1
##       10 0 1 1 0
##       11 0 1 0 1
##       12 0 0 1 1
```

Some panelists didn't prove all the 4 recipes, so this is a incomplete block design.
Now we have to check whether is balanced or partially balanced.

If we check all possible two-by-two combinations (AB, AC, AD, BC, BD), all of them occurs two times.
This means we have a Balanced Incomplete Block design.

b) Run both, the intra-block and inter-block analysis on it.

2. With the data set below, answer:.
a) What design was used in the following experiment?

b) Run the appropriate analysis using both ANOVA and REML.

```
data(oats, package = "MASS")
?oats
```

```
## No documentation for 'oats' in specified packages and libraries:
## you could try '??oats'
```

3. Design an experiment and present both the design and the layout (field map) for the following experiments:
a) To evaluate the effect of fertilization scheme and strawberry variety on fruit mass. Assume you have a 32 EU's available. The experiment consists of 8 different plots of land, 2 fertilization schemes, and 4 varieties.

b) An experiment to evaluate wine flavor. There are 42 brands of wine and 14 panelists.