STAT 401

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Homework #2

Page 47-49 #1, 3, 4, 5, 11, 14, 16, 17, 19

Problem 1

> An experiment is conducted to determine the optimal time and temperature combination for baking a cake. The response variable of interest is taste. Four batches of cake will be baked separately at each combination of baking times (25 and 30 minutes) and temperature settings ($275\ ^oF, 300^oF, and 325^oF$).

```
# inline comments in code chunck work the same as r normaly does
times = c(25,30)
temps = c(275,300,325)
combos = expand.grid(times,temps)
dat1 = data.frame(times,temps,'t'=combos[1:6,1],'T'=combos[1:6,2])
dat1
```

```
##   times temps  t   T
## 1    25   275 25 275
## 2    30   300 30 275
## 3    25   325 25 300
## 4    30   275 30 300
## 5    25   300 25 325
## 6    30   325 30 325
```

(a) What are the experimental units?

The experimental units are minutes for the time and $^oF^o$ for temperature.

LaTeX ref link

I think your awanser for a is not correct

An experimental unit is one member of a set of entities being studied. The experimental units here are batches of cake. We have 4 batches per combination of baking times and temp so we should have $4 \times 2 \times 3 = 24$ *experimental units.*

(b) What are the factors in this experiment?

The factors in this experiment is time and temperature.

(c) State the levels of each factor.

The time has two levels, 25 and 30 minutes and the temperature has three levels, 275, 300 and 325 ^oF.

(d) List all the treatments in this experiment.

There are not any treatments in this experiment since it is not a one-factor study.

I think your awanser for d is not correct

Treatments are the combenations of the experimental factors of intrest. A a one-factor study means the factor levels and treatments are the same. A two-factor study has one treatment for each combentation of factor levels. Here we have six treatments.