<p style="text-align:center">One-way ANOVA:
First parametrisation</p>

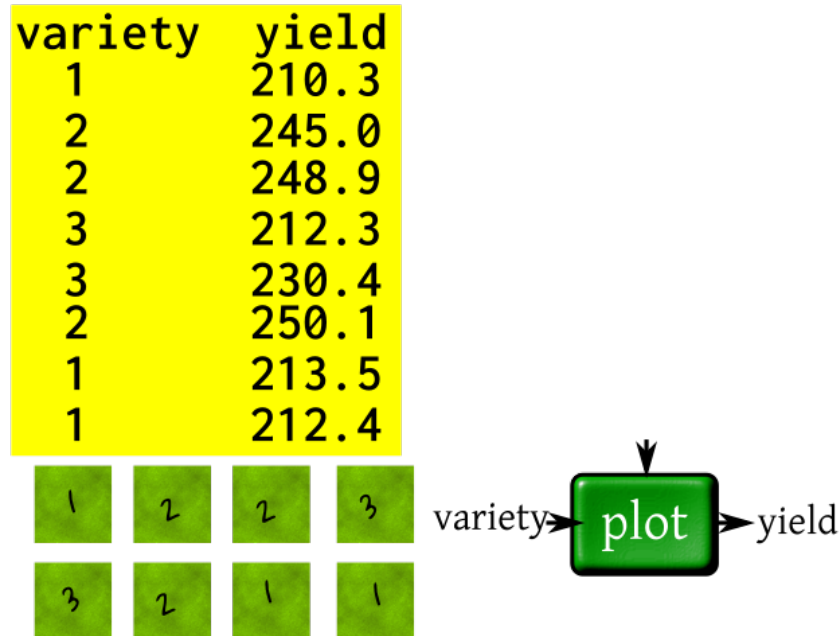<p style="text-align:center"><i>AVINANDAN ROY</i>
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So, what we want to do now , is to express that agricultural thing in mathematical model. This is the setup we have already-

Now, when we want to write it in terms of a mathematical model as opposed to writing the model in a software we have to be careful about the subscripts we use and as already said that the rule pf the subscripts. Here , we have only one factor input , namely variety and also the random error input. So, we are going to use to subscripts. One devoted to the factor input and the other is dedicated to the random error input.So, we are going to call these things y_{ij}.Now let's understand the genesis of the subscripts.

- i stands for the particular variety we have shown
- and j stands for the jth plot under the ith variety

So, the way we have defined we will have our first **2** as y_{21},second **2** as y_{22} and third **2** as y_{23} and similar things goes for the other materials also. So in this way the very subscripts itself will show what is the trick here and we have to understand this variety as a treatment because that is something the experimenter has consciously applied. So this is a statistically designed experiment and the j when they are differently taken with same, means i we are looking at two yields from plots that are identical and also the same variety, So, the only difference. So, the only difference between y_{11} and y_{12} are due to the random error . So, having more value of j will give us the better estimate of the error σ^2. So, if we do that , in that case we will naturally say that y_{ij} is an observed value because of two different reasons-

1. The effect of the variety
2. other one is the random error

So, a very useful and simple model-

$$y_{ij} = \alpha_i + \epsilon_{ij}$$

where i goes from 1 to 3 and range of j will depend on the particular i , we are using , for example if we take $i = 1$, j will go from 1 to 3 and if we take $i = 3$, j will take value only 1 and 2. So, it is a linear model and we have to estimate the α_i's.