Randomisation

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We have already discussed that when two inputs of the system change simultaneously, it gives rise to confounding. Blocking is one of the way to prevent the confounding when one of the inputs of the system is a control factor.
We know that random error is also an input of the system. However, the random error cannot be held fixed at a certain level while other inputs are changed. When other inputs are changed, the random error will change accordingly. Hence, idea of blocking cannot be directly applied to the random error input.
The idea behind the randomisation is to fix all the inputs at a certain level and allow only random error to vary. Randomisation takes two forms.

Repeated Measure Experiment

Suppose, our experiment is to hang the weight from the spring and measure the length of the spring.Then, we repeat the same experiment with the same weight multiple times so that the only input that changes is the random error. Since, we are repeating measurements with all the inputs fixed, this is known as repeated measure experiment.

Random Allocation

Suppose we have 20 plots which are as identical as possible and 4 varieties of crop and it has been decided to allocate 5 plots to each variety. Then, the allocation of plots need to be done randomly because there is an inevitable amount of variation between the plots and every variety need to be given a fair chance for those variations. In this form, a fixed number of objects are allocated to treatments in a random way.