STAT 5200 Handouts #18-23 (Overview)

Designs with Restrictions on Randomization (Ch. 13 & 16)

Until now, we've focused on examples where experimental units are randomly assigned to treatments. But sometimes, we have certain restrictions (or constraints) on randomization. These lead to several "named" designs, which we will discuss in Handouts #18-23:

Handout	Named Design	Chapter	Textbook Pages
18	Randomized Complete Block Design	13	315-324
	one trt. factor (maybe factorial combinations) randomized to units within block		
19	Latin Square Design	13	324-344, 441
	One trt. factor assigned in structured way to exp. units within two blocking factors (with same # levels as trt. factor)		
20	Split-Plot Design	16	417-428
	one blocking factor, two trt. factors (each with different size exp. unit & randomization); one randomization is nested		
21	Split-Split-Plot Design	16	428-434
	one blocking factor, three trt. factors (each with different size exp. unit & randomization); two randomizations are nested		
22	Strip Plot (Split Block) Design	16	434-438
	one blocking factor, two trt. factors (each with different size exp. unit & randomization); no nested randomization (neither is subset of the other)		
23	Repeated Measures Design	16	438-441
	like split-plot, but with "time" as [non-randomized] split-plot factor; multiple obs. on each exp. unit at the same time points		

Many other named designs extend from these six main designs. Keys here:

- A natural grouping of experimental units comprises one level of a 'blocking' factor
- Treatment factors are randomly assigned to experimental units
  - But different treatment factors could be applied to different experimental units
  - Also, the assignment (randomization) of experimental units could be restricted (nested within another factor's levels, for example) or not random at all.