

Things to know and formulas for Exam 2

Contrasts

A contrast is a linear combination of means, $\sum C_i \mu_i$, such that $\sum C_i = 0$.

- Null Hypothesis: $H_0 : \sum C_i \mu_i = 0$
- Estimated Contrast: $\sum C_i \bar{Y}_i$
- Sum of Squares Contrast: $\frac{(\sum C_i \bar{Y}_i)^2}{\sum \left(\frac{C_i^2}{n_i}\right)} = \frac{n(\sum C_i \bar{Y}_i)^2}{\sum C_i^2}$ if the design is balanced, i.e. $n_i = n$.
- Degrees of Freedom Contrast: 1
- F-ratio: $\frac{MS_{Contrast}}{MS_{Error}}$

Coefficients for a linear contrast.

	k=3	k=4	k=5	k=6	k=7	k=8	k=9	k=10
	C_i	C_i	C_i	C_i	C_i	C_i	C_i	C_i
	-1	-3	-2	-5	-3	-7	-4	-9
	0	-1	-1	-3	-2	-5	-3	-7
	1	1	0	-1	-1	-3	-2	-5
		3	1	1	0	-1	-1	-3
			2	3	1	1	0	-1
				5	2	3	1	1
					3	5	2	3
						7	3	5
							4	7
								9

Blocking

Make blocks so that within a block the experimental material is more homogeneous (similar).

- Sorting
- Sub-dividing
- Re-using

Block Designs

- Randomized Complete Block
- Latin Square
- Split Plot