STAT3015/4030/7030 GLMs

3/8/2017 (1)

Fisher's approach to the issue of multiple comparisons:

→ use an initial test at the right level of significance

eg for one-way ANOVA, the overall F test in the ANOVA table will tell you whether or not to expect any differences between the level means

→ compute Fisher's LSD (not corrected in any way for multiple comparisons)

"Least Significant Difference"

$$\underbrace{t_{n-p}}_{df_{error}}(0.975)\ \underbrace{\hat{\sigma}}_{\sqrt{MS_{error}}}\sqrt{\frac{2}{n_i}}$$

n_i: size of each of the levels (same for all levels in a balanced design)

this is the standard error for $(\bar{y}_{\text{level } i} - \bar{y}_{\text{level } j})$

So, for the corn data, Fisher's LSD

$$= t_{20}(0.975) \cdot 12.79062\sqrt{\frac{2}{6}} = (2.085963)(7.384669)$$

$$\simeq 15.4$$

So, any two levels with means that differ by more than this are "significantly" different

eg displayed graphically for the corn data