Lecture 5 03/30/19

MULTIPLE Regression → estimate the data

$\hat{y} = \beta x$

$\beta = (x'x)x'y$

ANOVA

$N = 32$

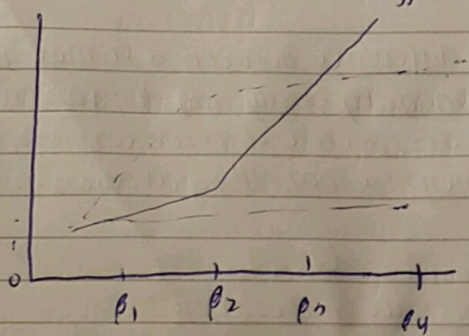
$n = 8$

$y_j' = \mu + \alpha_i \beta_j$ $\alpha_i = \mu_i - \mu$

• write the observations as a huge vector

H_0: μ and μ_2 are the same

H_1: # at least the mean is different



$\bar{\alpha} = \alpha \times$ # of comparisons

$F_{(ij)} = \frac{MSB}{MSE}$

- ~~divide~~ systematic vs unsystematic variation

$SST = \sum_{i=1}^{4} \sum_{i=1}^{8} (X_{ij} - \bar{X}_{..})$ → overall variation! systematic.

$SSB = n\sum_{i=1}^{4} (\bar{x}_j - \bar{x}_{..})^2$

need to do it for 4 different means

$SSE = \sum \sum (x_{ij} - \bar{x}_j)$

source	df	ss	ms	F	p
β					
error					
total					

Bonferroni

@ Tukey

- Reject H_0 if $p_i \leq \frac{\alpha}{m} = 0.008$

$SE = \sqrt{\frac{MSE}{n}}$

critical t (confidence intervals) = observed ± critical t × SE

- main effects

$y'_{ik} = \mu + \alpha_k A_k + \beta_j B_j + \alpha\beta_{jk} (A_k B_j)$

time mean effect

age mean effect

$\sum_{k=1}^{k} \alpha = 0$

SST
SSA
SSN

- systematic component of variance

$SST = \sum_i \sum_j \sum_k (x_{ijk} - \bar{x}_{...})^2$

$SSA = 10 \times \sum_{k=1}^{2} (\bar{x}_{\cdot k} - \bar{x})^2$

$SSB = 10 \times \sum (\bar{x}_{j} - \bar{x}_{..})$

$SSE = \sum_i \sum_j \sum_k (x_{ijk} - \bar{x}_{jk})^2$

$\boxed{SST = SSA + SSB + SSE + SSAB}$ → then do ANOVA table after this

source | SS | df | MS | F | P

$SSAB = \sum_{jk} \sum \sum (\bar{x}_{jk} - \bar{x}_k - \bar{x}_j + \bar{x})^2$

- losing df