ANOVA Tables

N: total # of obs.

- One-way ANOVA

Source	DF	SS
Factor A	$a-1$	$N\bar{y}_{..}^2$ (SSA)
Error	$N-a$	$\sum_{i=1}^{a}\sum_{j=1}^{n_i}(y_{ij}-\bar{y}_{i.})^2$ (SSE)

- Two-way ANOVA (Balanced case)

$$y_{ijk} = \mu + \alpha_i + \beta_j + \gamma_{ij} + \varepsilon_{ijk}$$

Source	DF	SS	MS
Factor A	$a-1$	SSA	SSA/(a-1)
Factor B	$b-1$	SSB	SSB/(b-1)
Interaction	$(a-1)(b-1)$	SSI	SSI/[(a-1)(b-1)]
Error	$ab(n-1)$	SSE	SSE/[ab(n-1)]

$$SSA = bn\sum_i(\bar{y}_{i..}-\bar{y}_{...})^2$$

$$SSB = an\sum_j(\bar{y}_{.j.}-\bar{y}_{...})^2$$

$$SSI = n\sum_i\sum_j(\bar{y}_{ij.}-\bar{y}_{i..}-\bar{y}_{.j.}+\bar{y}_{...})^2$$

$$SSE = \sum_i\sum_j\sum_k(y_{ijk}-\bar{y}_{ij.})^2$$