

# Two Factor Full Factorial Design with Replications

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These slides are available on-line at:

<http://www.cse.wustl.edu/~jain/cse567-06/>



- ❑ Model
- ❑ Computation of Effects
- ❑ Estimating Experimental Errors
- ❑ Allocation of Variation
- ❑ ANOVA Table and F-Test
- ❑ Confidence Intervals For Effects

# Model

- Replications allow separating out the interactions from experimental errors.
- Model: With  $r$  replications

$$y_{ijk} = \mu + \alpha_j + \beta_i + \gamma_{ij} + e_{ijk}$$

- $y_{ijk}$  = Response in the  $k$ th replication with factor A at level  $j$  and factor B at level  $i$
- $\mu$  = mean response
- $\alpha_j$  = Effect of factor A at level  $j$
- $\beta_i$  = Effect of Factor B at level  $i$
- $\gamma_{ij}$  = Effect of interaction between factors A and B
- $e_{ijk}$  = Experimental error