FORMULA SHEET FOR ONE-WAY ANOVA

I. DEGREES OF FREEDOM

- Degrees of freedom total
  \( df_T = n_T - 1 \)

- Degrees of freedom between
  \( df_{between} = K - 1 \)

- Degrees of freedom within
  \( df_w = N - ab \)

- Degrees of freedom a
  \( df_A = a - 1 \)

- Degrees of freedom b
  \( df_b = b - 1 \)

- Degrees of freedom a*b
  \( df_{a*b} = (a - 1)(b - 1) \)

II. SUM OF SQUARES

- Sum of Squares total
  \( SS_T = \sum x_T^2 - \frac{(\sum x_T)^2}{n_T} \)

- Sum of Squares between
  \( SS_{between} = \frac{(\sum x_1)^2}{n_1} + \frac{(\sum x_2)^2}{n_2} + \ldots - \frac{(\sum x_T)^2}{n_T} \)

- Sum of Squares within
  \( SS_w = SS_T - SS_b \)

- Sum of Squares a
  \( SS_a = \sum \frac{(\sum \text{for each row})^2}{n \text{ for each row}} - \frac{(\sum x)^2}{N} \)

- Sum of Squares b
  \( SS_b = \sum \frac{(\sum \text{for each column})^2}{n \text{ for each column}} - \frac{(\sum x)^2}{N} \)

- Sum of Squares a*b
  \( SS_{ab} = SS_{between} - SS_a - SS_b \)

III. MEAN SQUARES

- Mean square between
  \( MS_{between} = \frac{SS_{between}}{df_{between}} \)

- Mean square within
  \( MS_w = \frac{SS_w}{df_w} \)

- Mean square a
  \( MS_a = \frac{SS_a}{df_a} \)

- Mean square b
  \( MS_b = \frac{SS_b}{df_b} \)

- Mean square a*b
  \( MS_{a*b} = \frac{SS_{a*b}}{df_{a*b}} \)

IV. OBTAINED F

- F-obtained
  \( f = \frac{MS_{between}}{MS_w} \)

- F-obtained a
  \( f_a = \frac{MS_a}{MS_w} \)

- F-obtained b
  \( f_b = \frac{MS_b}{MS_w} \)

- F-obtained a*b
  \( f_{a*b} = \frac{MS_{a*b}}{MS_w} \)