Homework - 7

1) $A = [85, 92, 88, 78, 90]$

$B = [76, 82, 80, 70, 75]$

$C = [95, 89, 92, 88, 96]$

Significance level = 0.05.

$n = 15 \quad k = 3$

$df_1 = k - 1 = 2$

$df_2 = n - k = 15 - 3 = 12$

$\bar{Y}_1 = 1/5 [85 + 92 + 88 + 78 + 90]$

$= 86.6$

$\bar{Y}_2 = 1/5 [76 + 82 + 80 + 70 + 75]$

$= 76.6$

$$\bar{Y}_3 = \frac{1}{5}\left[95 + 89 + 92 + 88 + 96\right]$$

$$= 92$$

$$\bar{Y} = \left(85 + 92 + 88 + 78 + 90 \right.$$

$$76 + 82 + 80 + 70 + 75$$

$$\left. 95 + 89 + 92 + 88 + 96\right) / 15$$

$$\bar{Y} = 85.0666 \simeq 85.07$$

$$SS_B = \sum_{j=1}^{K} n_j \left(\bar{Y}_j - \bar{Y}\right)^2$$

$$SS_B = 5(86.6 - 85.07)^2 + 5(76.6 - 85.07)^2 + 5(92 - 85.07)^2$$

$$= 11.7045 + 357.858 + 240.818$$

$$= 610.3805$$

$$SS_B = 610.38$$

$$SS_w = \sum_{j=1}^{K} \sum_{i=1}^{n_i} \left(y_{ij} - \bar{y}_j\right)^2$$

$$SS_w = \left(85 - 86.6\right)^2 + \left(92 - 86.6\right)^2 + \left(88 - 86.6\right)^2$$
$$+ \left(78 - 86.6\right)^2 + \left(90 - 86.6\right)^2 + \left(76 - 76.6\right)^2$$
$$+ \left(86 - 76.6\right)^2 + \left(80 - 76.6\right)^2 + \left(70 - 76.6\right)^2$$
$$+ \left(75 - 76.6\right)^2 + \left(95 - 92\right)^2 + \left(89 - 92\right)^2$$
$$+ \left(92 - 92\right)^2 + \left(88 - 92\right)^2 + \left(96 - 92\right)^2$$
$$= 119.2 + 87.2 + 50$$
$$= 256.4$$