Problem​ ​Statement​ ​1:

Using the following data, perform a oneway analysis of variance using α=.05. Write up

the results in APA format.

[Group1: 51, 45, 33, 45, 67]

[Group2: 23, 43, 23, 43, 45]

[Group3: 56, 76, 74, 87, 56]

Solution:

[Group1: 51, 45, 33, 45, 67]

[Group2: 23, 43, 23, 43, 45]

[Group3: 56, 76, 74, 87, 56]

Means of the above groups: 48.2, 35.4, 69.8

Standard deviations of the groups are

SD of G1: [2.8,-3.2,-15.2, -3.2, 18.8]

SD of G2: [-12.4, 7.6, -12.4, 7.6, 9.6]

SD of G3: [-13.8, 6.2, 4.2, 17.2, -13.8]

squares:

G1: [7.84, 10.24, 231.04, 10.24, 353.44]

G2: [153.76, 57.76, 153.76, 57.76, 92.16]

G3: [190.44, 38.44, 17.64, 295.84, 190.44]

Sum of Squares are

G1: 612.8, G2: 515.2, G3: 732.8

Variance calculations of the groups

G1 = 612.8/(5-1) = 153.2

G2 = 515.2/4 = 128.8

G3 = 732.8/4 = 183.2

Mean standard Error = 153.2 + 128.8 + 183.2 / 3 = 155.07

Degree error = 15 – 3 = 12

Sum of Squares error = 155.07 \* 12 = 1860.8

Mean of means = 48.2 + 35.4 + 69.8 / 3 = 51.13

Deviation for mean of means = 48.2 – 51.13 = -2.93, 35.4 – 51.13 = -15.73, 69.8 -51.13 = 18.67

Respective squares = 8.58, 247.43, 348.57

Sum of squares : 604.58

Variance of mean = 604.58/2 = 302.29

Mean = 302.29 \* 5 = 1511.45

Deviation for group = 3-1 = 2

Sum of squares error = 1151.45 \* 2 = 3022.9

F = 1151.45 / 155.07 = 9.75

Critical value (2,12) = 3.89

Anova Table

source SS df MS F

group 3022.9 2 1511.45 9.75

error 1860.8 12 155.07

total 4883.7

n2 = 3022.9 / 4883.7 = 0.62

APA writeup, F(2,12) = 9.75, p < 0.05, n2 = 0.62