/\*\*\*\* Exercise 9.7 non transformed data \*\*\*\*\*\*/

**data** river;

input sample one\_km five\_km ten\_km twenty\_km;

datalines;

1 1 4 20 37

2 5 8 26 30

3 2 2 24 26

4 1 3 11 24

5 2 8 28 41

6 2 5 20 25

7 4 6 19 36

8 3 4 19 31

9 0 3 21 31

10 2 3 24 33

;

**run**;

**proc** **transpose** data = river out = river1(keep = \_name\_ col1 rename=(\_name\_ = distance col1 = oxygen));

by sample;

**run**;

**proc** **glm** data = river1;

class distance;

model oxygen = distance;

means distance / lsd;

**run**;

/\*\*\*\* linear contrast statements \*\*\*\*/

**proc** **glm** data = river1;

class distance;

model oxygen = distance;

contrast "20 Km vs all 3 km's" distance -**1** -**1** -**1** **3**;

contrast "10 Km vs 1km & 5km" distance -**1** -**1** **2** **0**;

contrast "5km vs 1km" distance -**1** **1** **0** **0**;

**run**;

/\*\*\*\* finding critical value of F \*\*\*\*/

**data** findf;

f\_critical = finv(**0.95**,**3**,**36**);

**run**;

/\*\*\* Exercise 9.7 on transformed data \*\*\*/

**data** river\_trans;

input sample one\_km five\_km ten\_km twenty\_km;

datalines;

1 1.173 2.092 4.514 6.114

2 2.318 2.894 5.136 5.511

3 1.541 1.541 4.937 5.136

4 1.173 1.837 3.373 4.937

5 1.541 2.894 5.327 6.432

6 1.541 2.318 4.514 5.037

7 2.092 2.525 4.402 6.031

8 1.837 2.092 4.402 5.601

9 0.612 1.837 4.623 5.601

10 1.541 1.837 4.937 5.777

;

**run**;

**proc** **transpose** data = river\_trans out = river11(keep = \_name\_ col1 rename=(\_name\_ = distance col1 = oxygen));

by sample;

**run**;

**proc** **glm** data = river11;

class distance;

model oxygen = distance;

means distance / lsd;

**run**;

/\*\*\*\* linear contrast statements \*\*\*\*/

**proc** **glm** data = river11;

class distance;

model oxygen = distance;

contrast "20 Km vs all 3 km's" distance -**1** -**1** -**1** **3**;

contrast "10 Km vs 1km & 5km" distance -**1** -**1** **2** **0**;

contrast "5km vs 1km" distance -**1** **1** **0** **0**;

**run**;

/\*\*\*\*\* Exercise 9.12 \*\*\*\*\*\*\*\*\*/

**data** deer;

input env $ weight;

datalines;

Wild 114.7

Wild 128.9

Wild 111.5

Wild 116.4

Wild 134.5

Wild 126.7

Wild 120.6

Wild 129.59

Ranch 120.4

Ranch 91

Ranch 119.6

Ranch 119.4

Ranch 150

Ranch 169.7

Ranch 100.9

Ranch 76.1

Zoo 103.1

Zoo 90.7

Zoo 129.5

Zoo 75.8

Zoo 182.5

Zoo 76.8

Zoo 87.3

Zoo 77.3

;

**run**;

**proc** **glm** data = deer;

class env;

model weight = env;

means env / lsd;

**run**;

**proc** **glm** data = deer;

class env;

model weight = env;

contrast "Wild Vs Zoo" env **0** **1** -**1**;

contrast "Wild Vs Ranch" env -**1** **1** **0**;

**run**;

/\*\*\*\* finding critical value of F \*\*\*\*/

**data** findf\_;

f\_critical = finv(**0.95**,**2**,**21**);

**run**;

/\*\*\* exercise 15.6 \*\*\*\*\*\*\*\*\*/

**proc** **import** datafile = "C:\Users\Shruti\Documents\MS 1st Year\Courses\_Winter2017\ANOVA Models\SAS Practice\0495017582\_151433\Excel\CH15\ex15-6.xls"

out = ex15\_6 dbms = xls replace;

sheet = "ex15-6";

**run**;

**data** music;

set ex15\_6;

keep typemusic typingefficiency subject;

**run**;

/\*\*\* parameter estimate calculation \*\*/

**proc** **glm** data = music;

class typemusic subject;

model typingefficiency = typemusic subject /solution;

**run**;

/\*\*\* Multiple comparison test \*\*\*/

**proc** **glm** data = music;

class typemusic subject;

model typingefficiency = typemusic subject;

means typemusic / lsd;

**run**;

/\*\*\*\*\*\*\*\* Exercise 15.10 \*\*\*\*\*\*\*\*\*\*/

**data** mileage;

input model driver blend $ mpg;

datalines;

1 1 A 15.5

1 2 B 16.3

1 3 C 10.5

1 4 D 14.0

2 1 B 33.8

2 2 C 26.4

2 3 D 31.5

2 4 A 34.5

3 1 C 13.7

3 2 D 19.1

3 3 A 17.5

3 4 B 19.7

4 1 D 29.2

4 2 A 22.5

4 3 B 30.1

4 4 C 21.6

;

**run**;

/\*\* AOV \*\*/

**proc** **glm** data = mileage;

class blend /\* treatment \*/ driver /\* block1 \*/ model /\* block2 \*/;

model mpg = blend driver model ;

means blend / lsd;

**run**;

**quit**;

/\*\*\* parameter estimate \*\*\*/

**proc** **glm** data = mileage;

class blend /\* treatment \*/ driver /\* block1 \*/ model /\* block2 \*/;

model mpg = blend driver model/solution;

**run**;

**quit**;

/\*\*\* equal variances assumption \*\*/

**proc** **glm** data = mileage;

class blend driver model;

model mpg = blend ;

means blend / hovtest = levene; /\*\* leven's test only works for one sample test so blcks are removed \*\*/

output out = resid1 r = res1;

**run**;

**quit**;

/\*\* normality of residuals \*\*/

**proc** **univariate** data = resid1 normal plot;

var res1;

**run**;