**9.7**

data one;

input sample$ onekm fivekm tenkm twentykm;

cards;

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 glm data=one;

class sample;

model onekm fivekm tenkm twentykm= sample;

Run;

**9.12**

**A.**

Data One;

input Environment$ Weight;

CARDS;

W 114.7

W 128.9

W 111.5

W 116.4

W 134.5

W 126.7

W 120.6

W 129.59

R 120.4

R 91.0

R 119.6

R 119.4

R 150.0

R 169.7

R 100.9

R 76.1

Z 103.1

Z 90.7

Z 129.5

Z 75.8

Z 182.5

Z 76.8

Z 87.3

Z 77.3

RUN;

------------------------------------------

PROC GLM DATA=ONE;

class environment;

model weight=environment;

means environment / LSD;

RUN;

-----------------------------------------

proc glm data=one;

class environment;

model weight=environment;

contrast 'Wild vs. Zoo'environment 0 1 -1;

contrast 'Wild vs. ranch' environment -1 1 0;

Run;

**15.6**

A.

Data two;

input subject Musictype$ Type;

cards;

1 NM 20

2 NM 17

3 NM 24

4 NM 20

5 NM 22

6 NM 25

7 NM 18

1 HR 20

2 HR 18

3 HR 23

4 HR 18

5 HR 21

6 HR 22

7 HR 19

1 C 24

2 C 20

3 C 27

4 C 22

5 C 24

6 C 28

7 C 16

RUN;

----------------------------------------

proc glm data=two;

class musictype subject ;

model Type=musictype subject/ solution;

run;

----------------------------------------

proc glm data = TWO;

class subject musictype;

model type= subject musictype;

means musictype / lsd;

run;

**15.10**

data three;

input Driver$ Model$ Blend$ MPG;

CARDS;

1 1 A 15.5

1 2 B 33.8

1 3 C 13.7

1 4 D 29.2

2 1 B 16.3

2 2 C 26.4

2 3 D 19.1

2 4 A 22.5

3 1 C 10.5

3 2 D 31.5

3 3 A 17.5

3 4 B 30.1

4 1 D 14.0

4 2 A 34.5

4 3 B 19.7

4 4 C 21.6

run;

---------------------------------------

proc glm data=three; /\*ANOVA and LSD model\*/

class driver model blend;

model mpg= driver model blend;

means blend / lsd; /\*compare treatment means\*/

Run;

---------------------------------------

proc glm data=three; /\* Normality assumption\*/

class driver model blend;

model mpg=blend;

output out= resids r=res;

run;

Quit;

----------------------------------------

proc univariate normal plot; /\*tells SAS to run tests of normality and give a QQ plot\*/

var res;

Run;

----------------------------------------

proc glm data=three; /\*equal variances assumption\*/

class driver model blend;

model mpg=blend;

\*means method/lsd;

means blend/hovtest=levene;

run;