**data** nested;

Do site =**1** to **2**;

Do batch=**1** to **3**;

Do tablet =**1** to **5**;

Input y; output;

end; end;end;

cards;

5.03

5.10

5.25

4.98

5.05

4.64

4.73

4.82

4.95

5.06

5.10

5.15

5.20

5.08

5.14

5.05

4.96

5.12

5.12

5.05

5.46

5.15

5.18

5.18

5.11

4.90

4.95

4.86

4.86

5.07

**run**;

\*SAS by default does not always construct the correct F test;

\*You can use the TEST statement in PROC GLM to construct the appropriate F tests;

**proc** **glm** data=nested;

class site batch;

model y= site batch(site) /E1;

\*E1 option gives Type I Expected Mean Square;

random batch(site);

title "Mixed effect nested model, major effect is fixed, minor effect is random";

**run**;

**quit**;

**proc** **glm** data=nested;

class site batch;

model y= site batch(site) /E1;

random batch(site);

\*Comment: The test H statement tells SAS how to run the F-test you want.

\*H refers to the numerator of the F-test (i.e. trt)

\*R refers to the denominator of the F-test(error term);

test H=site E=batch(site);

title "Mixed effect nested model, major effect is fixed, minor effect is random";

**run**;

**quit**;

\*There is also a procedure call proc nested. here is how you can use proc GLM and Proc nested interchangeably;

/\* proc glm;

class a b c d;

model y=a b(a) c(a b) d(a b c);

proc nested;

class a b c d;

var y;

\*/

**proc** **nested** data=nested;

class site batch;

var y;

title "Mixed effect nested model, major effect is fixed, minor effect is random";

**run**;

**quit**;

\*Additional note;

\* GLM require TEST statements to perform appropriate tests, whereas the NESTED procedure produces the appropriate tests automatically.

\*However, PROC NESTED assumes that the input data set is sorted by the classification (CLASS) variables defining the effects;

**\*Exercise #2;**

**proc glm data=BP;**

**class drug non age;**

**model bp\_reduction= drug|non|age bp\_baseline;**

**random non non\*drug non\*age non\*age\*drug;**

**run;**