

STAT 5200 Handout #5: Completely Randomized Designs (Ch. 3-6)

Example: [Beet Lice, same data as Handout #4] Here, look at comparing equality of all four chemical treatments.

```

/* Enter data */
data lice;
  input Chemical $ Numlice @@;
  datalines;
A 12 B 10 C 23 D 32 A 13 B 21 C 14 D 26 A 26 B 34
C 14 D 24 A 13 B 15 C 20 D 16 A 17 B 5 C 27 D 32
A 24 B 22 C 25 D 18 A 14 B 12 C 17 D 33 A 10 B 25
C 18 D 16 A 6 B 18 C 29 D 34 A 4 B 12 C 14 D 18
A 2 B 2 C 31 D 9 A 10 B 2 C 5 D 19 A 8 B 10
C 13 D 29 A 6 B 22 C 18 D 30 A 7 B 17 C 23 D 18
A 13 B 20 C 16 D 25 A 18 B 19 C 13 D 20 A 10 B 20
C 23 D 21 A 18 B 12 C 4 D 27 A 3 B 11 C 16 D 31
A 4 B 16 C 17 D 25 A 18 B 5 C 9 D 33 A 13 B 11
C 28 D 24 A 10 B 17 C 23 D 16 A 21 B 16 C 19 D 24
;
run;

/* Compare all chemicals */
proc glm data=lice plots=diagnostics;
  class Chemical;
  model Numlice = Chemical;
  title 'Comparison of all chemicals';
run;
  
```

cards → (pointing to datalines)

general linear model → (pointing to model statement)

list factors → (pointing to class statement)

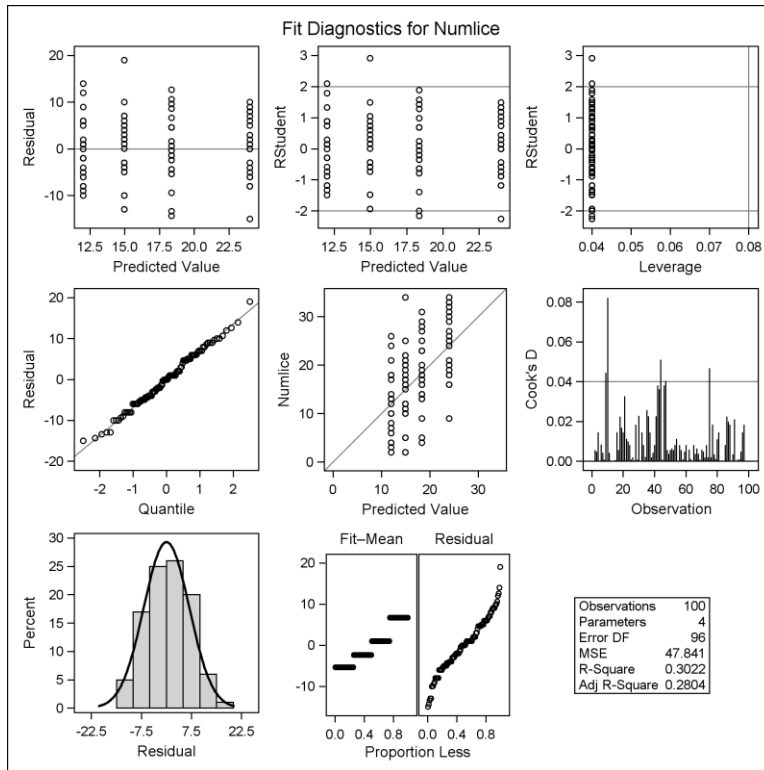
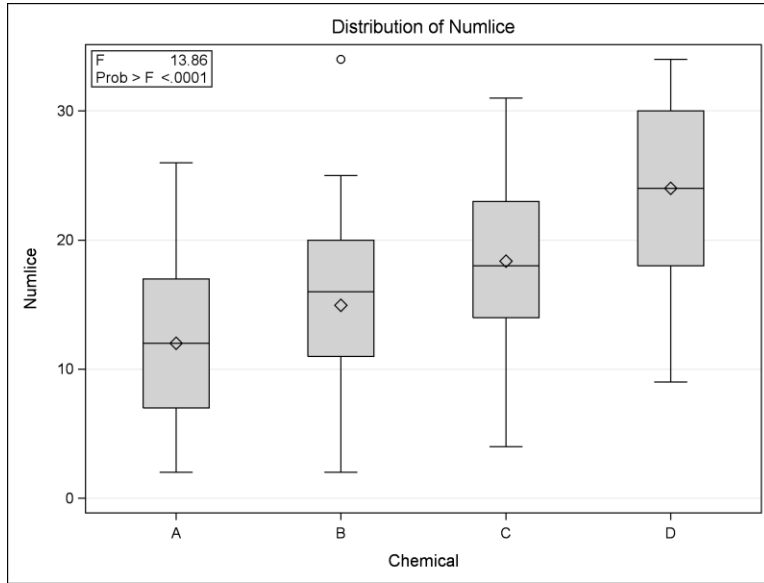
How does Numlice depend on chemical
" = "

Comparison of all chemicals					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model (Trt)	3	1989.390000	663.130000	13.86	<.0001
Error	96	4592.720000	47.840833		
Corrected Total	99	6582.110000			

R-Square	Coeff Var	Root MSE	Numlice Mean
0.302242	39.91175	6.916707	17.33000

F_{3,96}
13.86
<.0001

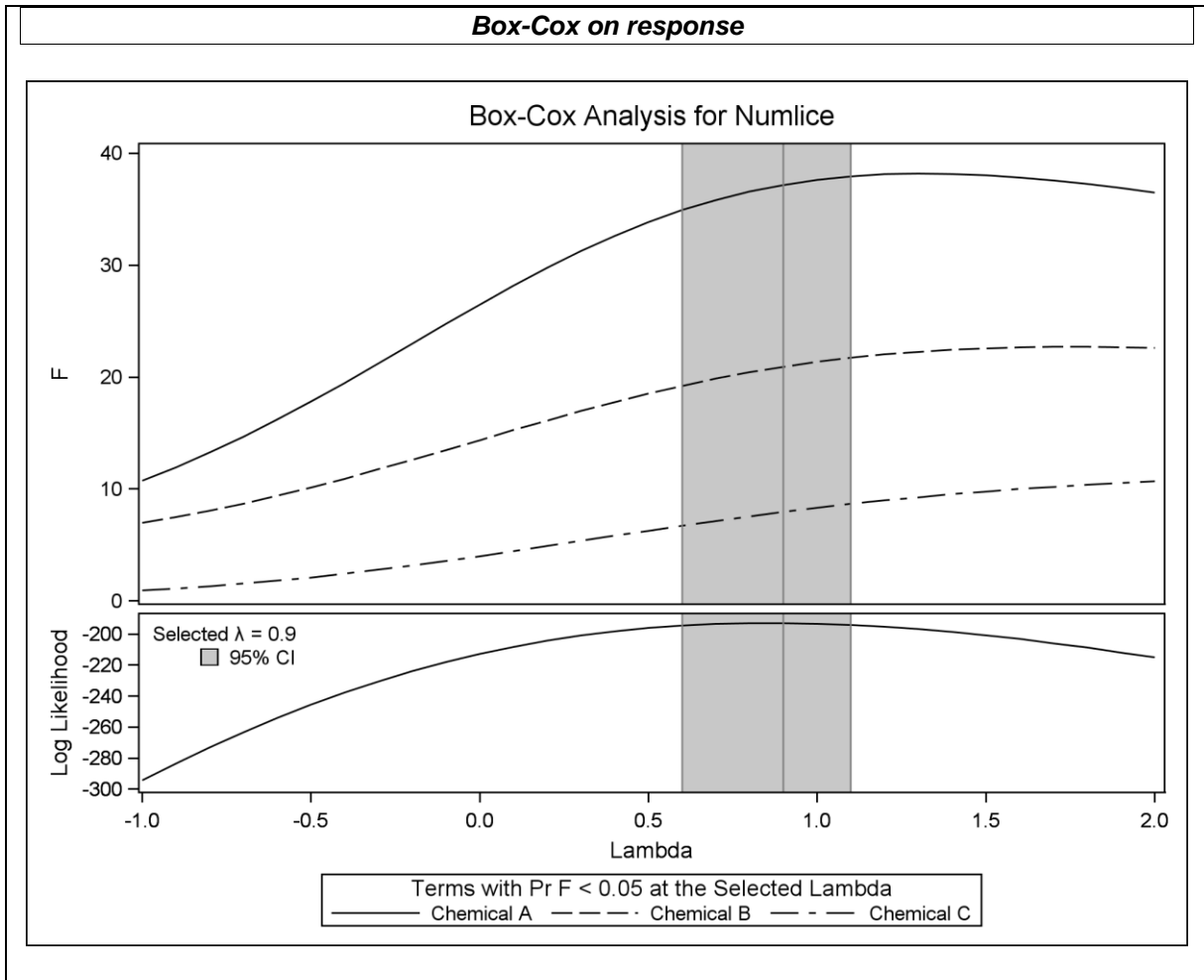
Source	DF	Type III SS	Mean Square	F Value	Pr > F
Chemical	3	1989.390000	663.130000	13.86	<.0001



```

/* Consider transformation */
proc transreg data=lice;
  model boxcox(Numlice / lambda=-1 to 2 by 0.1)
    = class(Chemical);
  title 'Box-Cox on response';
run;

```



```

/* Some optional output */
proc glm data=lice;
  class Chemical;
  model Numlice = Chemical;
  means Chemical / HOVtest=Levene;
  title1 'Homogeneity of Variance test';
run;

```

<i>Homogeneity of Variance test</i>					
The GLM Procedure					
Levene's Test for Homogeneity of Numlice Variance					
ANOVA of Squared Deviations from Group Means					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Chemical	3	2322.6	774.2	0.21	0.8907
Error	96	357540	3724.4		

Level of Chemical	N	Numlice	
		Mean	Std Dev
A	25	12.0000000	6.45497224
B	25	14.9600000	7.43572458
C	25	18.3600000	6.99928568
D	25	24.0000000	6.73918887