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(ch4-2-crab-1_HO.out)
OPTIONS LS=80 PS=66 MPRINT NODATE PAGENO=1 NOCENTER;

%LET data_f1 = crab.dat;

FILENAME file1 URL "http://www.uvm.edu/~rsingle/stat231/data/other/&data_f1";

DATA a1;
  INFILE file1 FIRSTOBS=2;
  INPUT number habitat;
  x1 = ABS(number);
  x2 = SQRT(number);
  x3 = number**(1/2);
  x4 = number**2;
  IF (number > 0) THEN x5 = LOG(number);
RUN;

title "Original Data";

*Save the residuals and predicted values in the dataset 'a2';
PROC GLM DATA=a1;
  CLASS habitat;
  MODEL number = habitat;
  OUTPUT OUT=a2 PREDICTED=pred RESIDUAL=resid;
RUN;

*A QQ plot using the observed mean and sd for the reference line;
PROC UNIVARIATE NORMAL DATA=a2;
  VAR resid;
  QQPLOT resid / normal(MU=EST SIGMA=EST);
RUN;

*-----;

*Plot of residuals vs. predicted values;
PROC GPLOT DATA=a2;
  PLOT resid*pred;
RUN;

*Compute Levene's and Brown & Forsythe's HOV tests;
PROC GLM DATA=a1;
  CLASS habitat;
  MODEL number = habitat;
  MEANS habitat / HOVTEST=LEVENE HOVTEST=BF;
RUN;
QUIT;

*-----;

```

Original Data

1

Class Level Information

Class	Levels	Values
habitat	6	1 2 3 4 5 6

Number of Observations Read 150

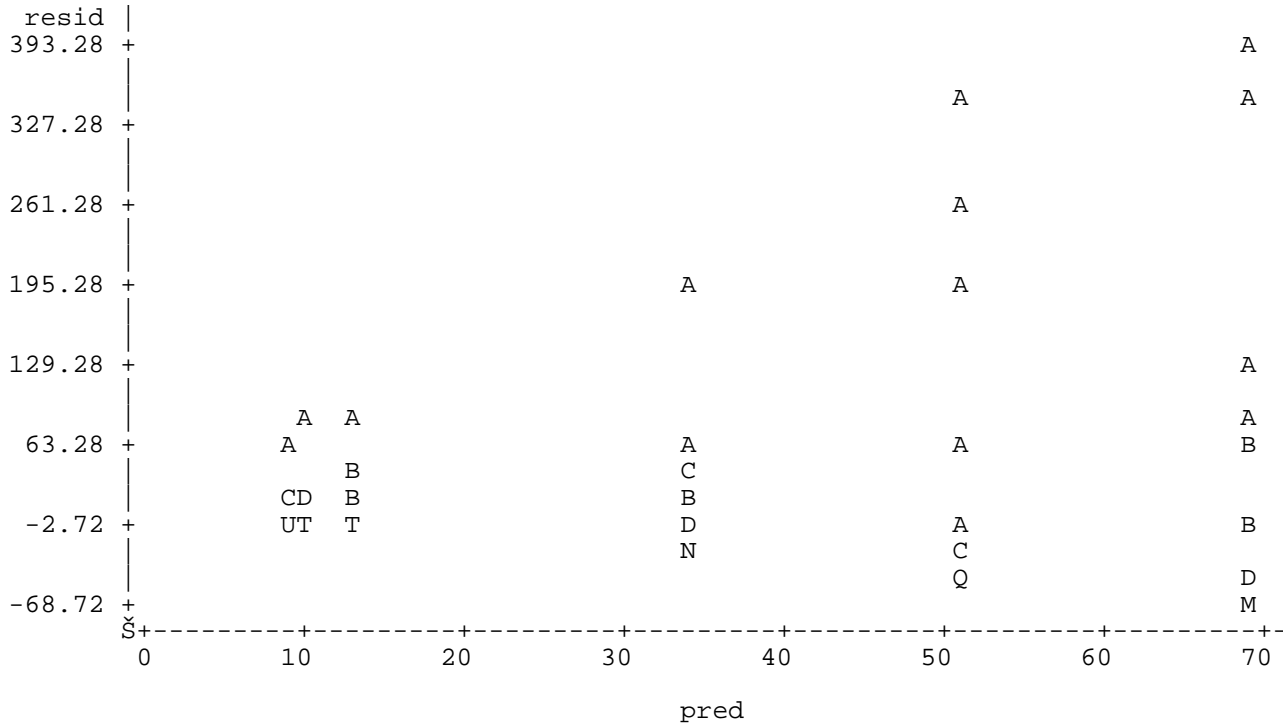
Dependent Variable: number

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	76695.0400	15339.0080	2.97	0.0140
Error	144	744493.1200	5170.0911		
Corrected Total	149	821188.1600			

R-Square	Coeff Var	Root MSE	number Mean
0.093395	233.1496	71.90335	30.84000

Original Data

Plot of resid*pred. Legend: A = 1 obs, B = 2 obs, etc.



The GLM Procedure

Levene's Test for Homogeneity of number Variance
ANOVA of Squared Deviations from Group Means

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
habitat	5	5.2242E9	1.0448E9	2.72	0.0221
Error	144	5.526E10	3.8375E8		

Brown and Forsythe's Test for Homogeneity of number Variance
ANOVA of Absolute Deviations from Group Medians

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
habitat	5	71145.7	14229.1	2.93	0.0151
Error	144	699845	4860.0		

Original Data

The GLM Procedure

Level of habitat	N	Mean	Std Dev
1	25	33.8000000	50.385183
2	25	68.7200000	125.353673
3	25	50.6400000	107.437920
4	25	9.2400000	17.386010
5	25	10.0000000	19.841035
6	25	12.6400000	23.010650