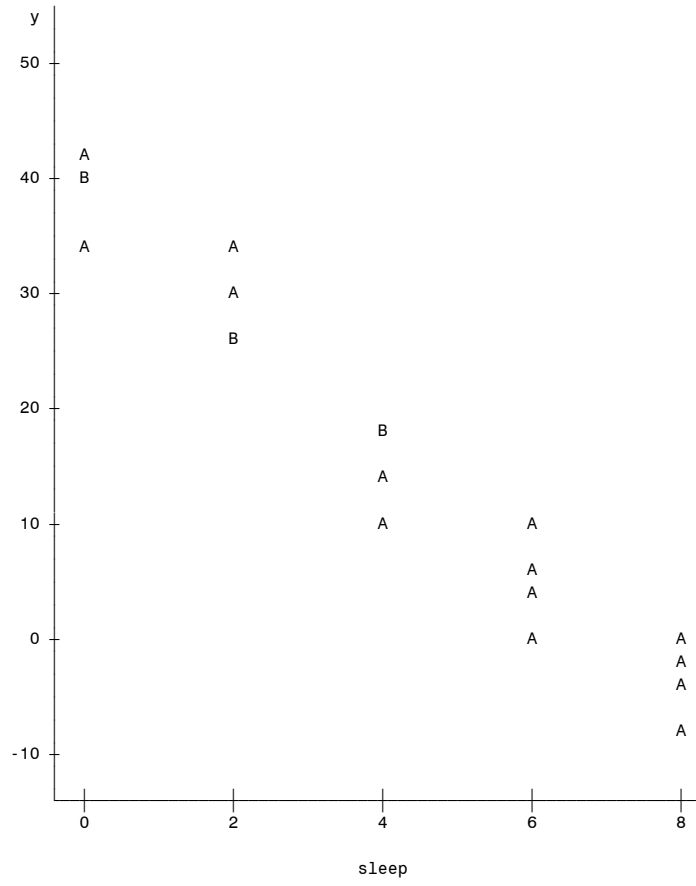


Problem 13.52

Plot of $y \cdot \text{sleep}$. Legend: A = 1 obs, B = 2 obs, etc.



Problem 13.52

The REG Procedure Model: MODEL1 Dependent Variable: y

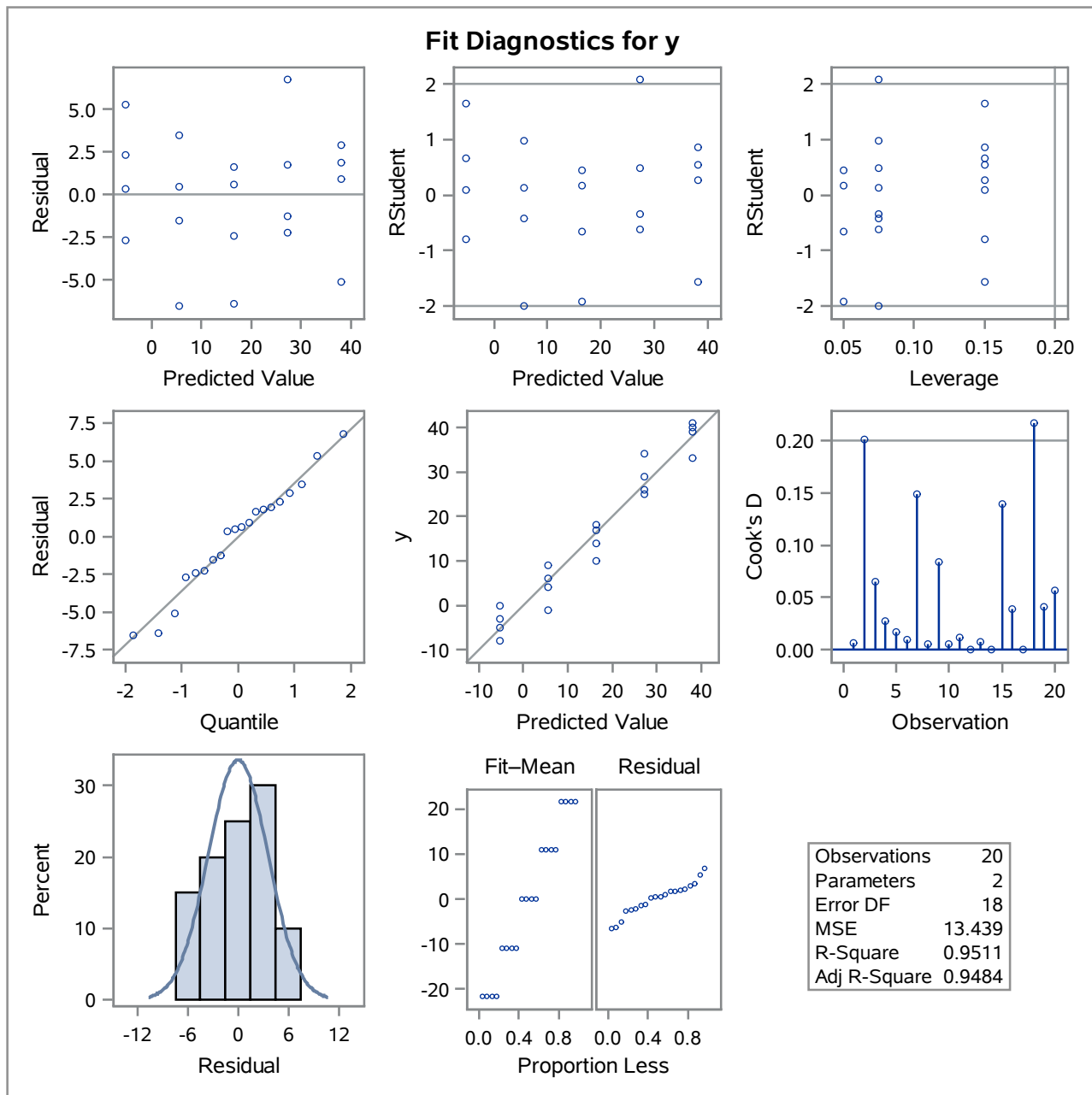
Number of Observations Read	20
Number of Observations Used	20

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	4708.90000	4708.90000	350.39	<.0001
Error	18	241.90000	13.43889		
Corrected Total	19	4950.80000			

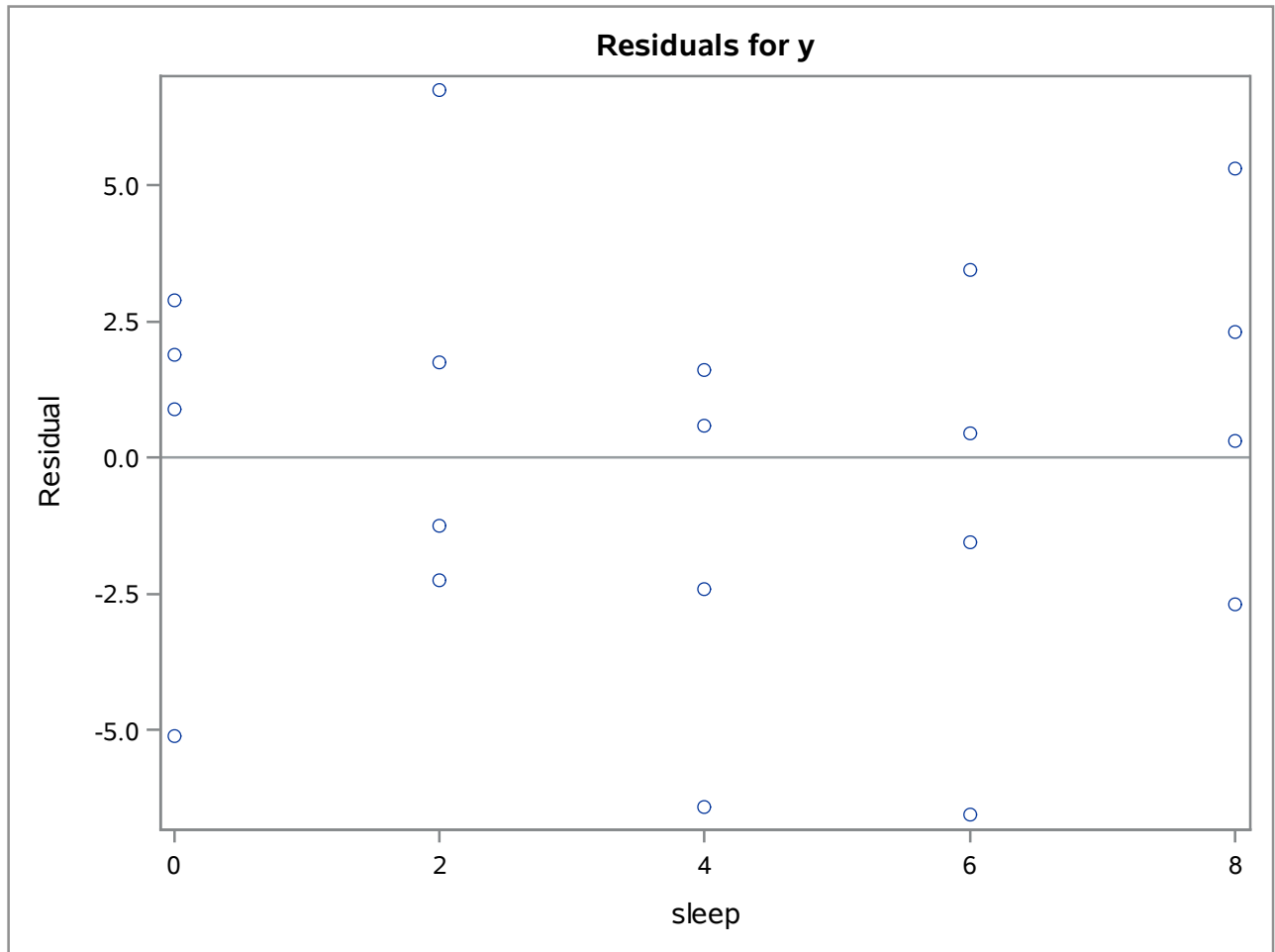
Root MSE	3.66591	R-Square	0.9511
Dependent Mean	16.40000	Adj R-Sq	0.9484
Coeff Var	22.35310		

Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	38.10000	1.41980	26.83	<.0001
sleep	1	-5.42500	0.28982	-18.72	<.0001

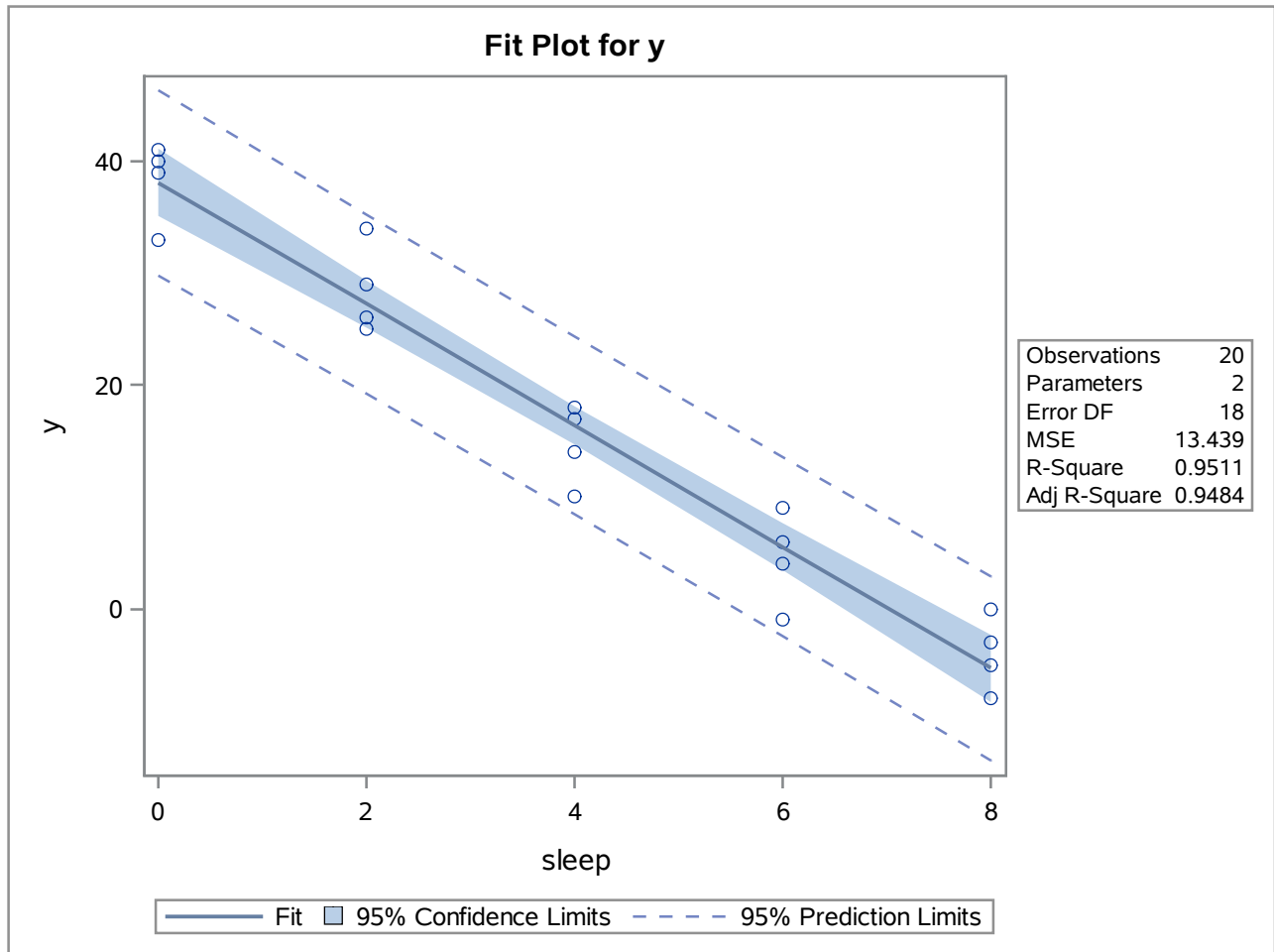
The REG Procedure
 Model: MODEL1
 Dependent Variable: y



The REG Procedure
Model: MODEL1
Dependent Variable: y

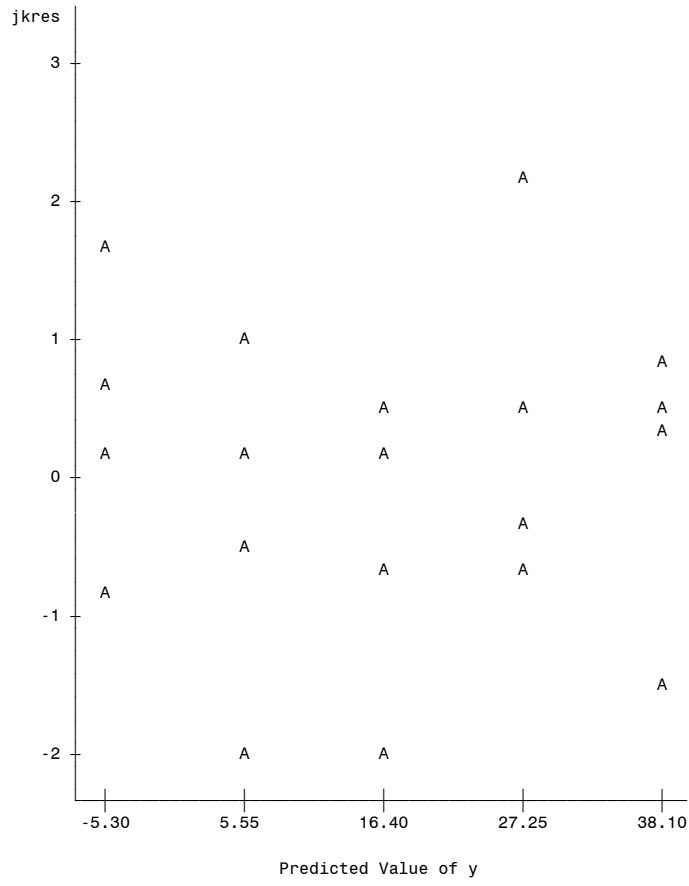


The REG Procedure
Model: MODEL1
Dependent Variable: y



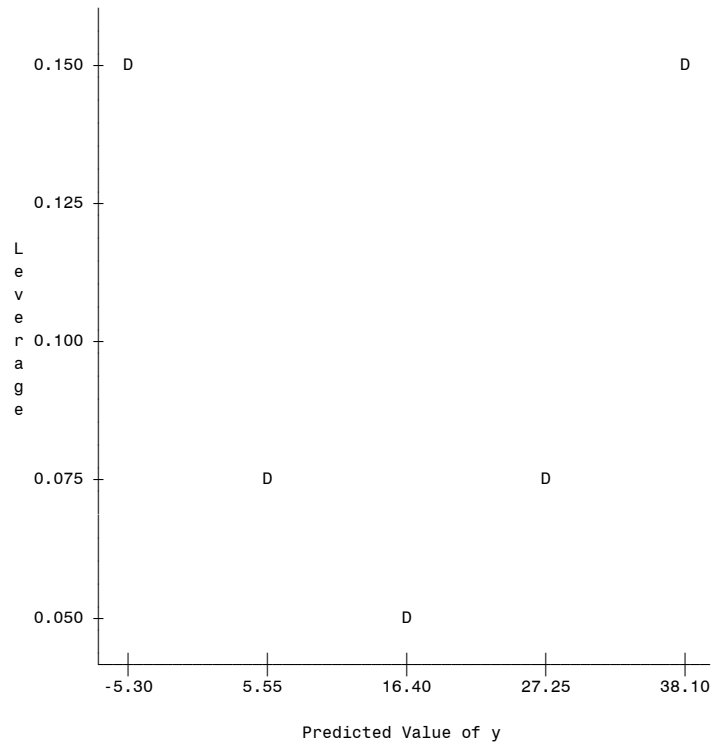
Problem 13.52

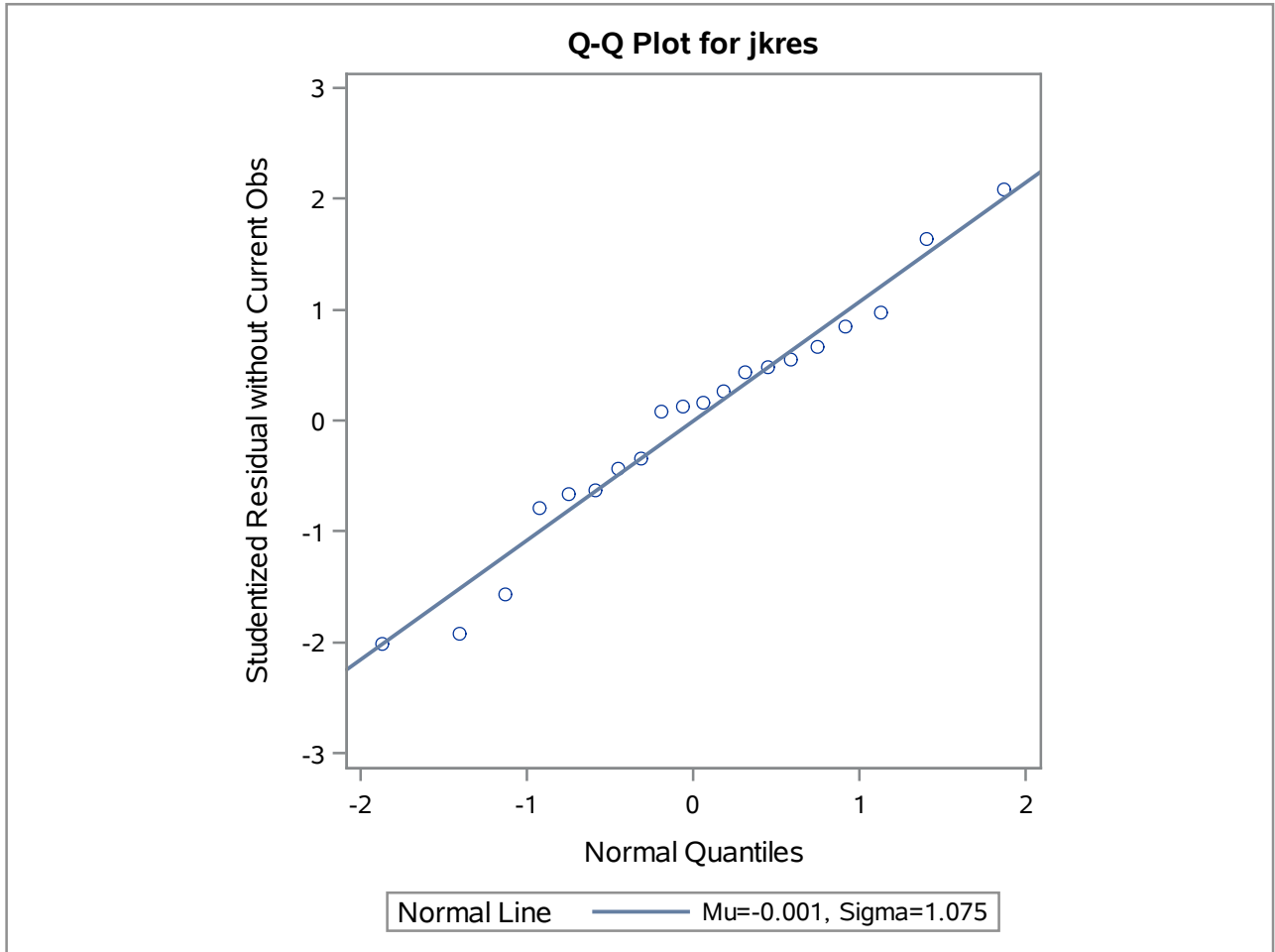
Plot of $jkres \cdot \text{pred.}$ Legend: A = 1 obs, B = 2 obs, etc.



Problem 13.52

Plot of \hat{y} *pred. Legend: A = 1 obs, B = 2 obs, etc.





Problem 13.67

Obs	OBS	RISK	STAY	AGE	INS	SCHOOL	RC1	RC2	RC3
1	1	4.1	7.13	55.7	9.0	0	0	0	1
2	2	1.6	8.82	58.2	3.8	0	1	0	0
3	3	2.7	8.34	56.9	8.1	0	0	1	0
4	4	5.6	8.95	53.7	18.9	0	0	0	1
5	5	5.7	11.20	56.5	34.5	0	0	0	0
6	6	5.1	9.76	50.9	21.9	0	1	0	0
7	7	4.6	9.68	57.8	16.7	0	0	1	0
8	8	5.4	11.18	45.7	60.5	1	1	0	0
9	9	4.3	8.67	48.2	24.4	0	0	1	0
10	10	6.3	8.84	56.3	29.6	0	0	0	0
11	11	4.9	11.07	53.2	28.5	1	0	0	0
12	12	4.3	8.30	57.2	6.8	0	0	1	0
13	13	7.7	12.78	56.8	46.0	1	0	0	0
14	14	3.7	7.58	56.7	20.8	0	1	0	0
15	15	4.2	9.00	56.3	14.6	0	0	1	0
16	16	5.6	10.12	51.7	14.9	1	0	1	0
17	17	5.5	8.37	50.7	15.1	0	1	0	0
18	18	4.6	10.16	54.2	8.4	1	0	0	1
19	19	6.5	19.56	59.9	17.2	0	0	0	0
20	20	5.5	10.90	57.2	10.6	0	1	0	0
21	21	1.8	7.67	51.7	2.5	0	0	1	0
22	22	4.2	8.88	51.5	10.1	0	0	1	0
23	23	5.6	11.48	57.6	20.3	0	0	0	0
24	24	4.3	9.23	51.6	11.6	0	1	0	0
25	25	7.6	11.41	61.1	16.6	0	0	0	0
26	26	7.8	12.07	43.7	52.4	0	1	0	0
27	27	3.1	8.63	54.0	8.4	0	0	0	0
28	28	3.9	11.15	56.5	7.7	0	0	0	0

Problem 13.67

The REG Procedure
Model: MODEL1
Dependent Variable: RISK

Number of Observations Read	28
Number of Observations Used	28

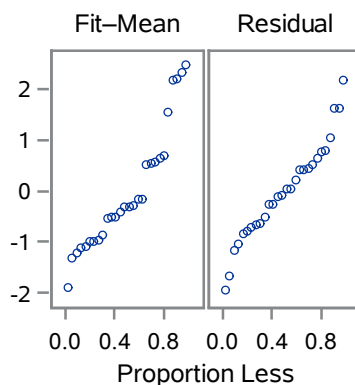
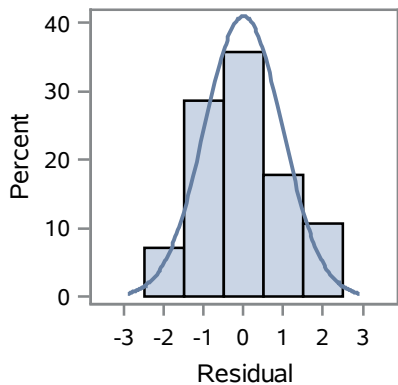
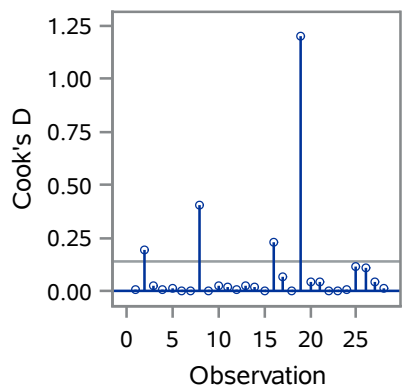
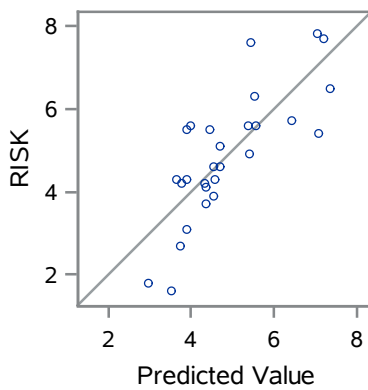
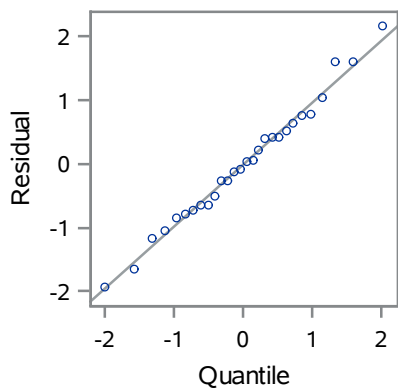
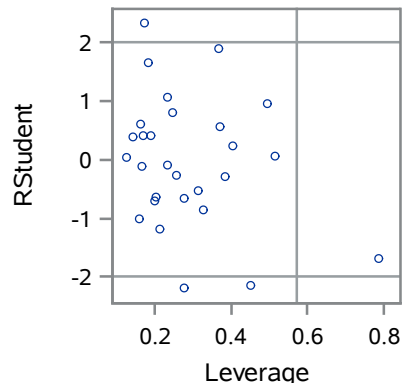
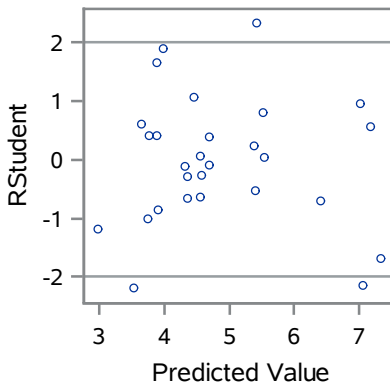
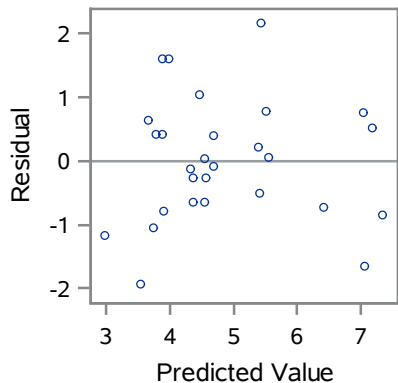
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	39.49805	5.64258	4.42	0.0041
Error	20	25.54623	1.27731		
Corrected Total	27	65.04429			

Root MSE	1.13018	R-Square	0.6072
Dependent Mean	4.86429	Adj R-Sq	0.4698
Coeff Var	23.23429		

Parameter Estimates						
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t	Variance Inflation
Intercept	1	-1.07801	4.69135	-0.23	0.8206	0
STAY	1	0.23613	0.11569	2.04	0.0547	1.59298
AGE	1	0.04360	0.07811	0.56	0.5829	2.14702
INS	1	0.06924	0.02278	3.04	0.0065	2.25270
SCHOOL	1	-0.41517	0.64823	-0.64	0.5291	1.35113
RC1	1	-0.26956	0.68941	-0.39	0.6999	2.12630
RC2	1	-0.19268	0.71943	-0.27	0.7916	2.31552
RC3	1	0.70243	0.88962	0.79	0.4390	1.65966

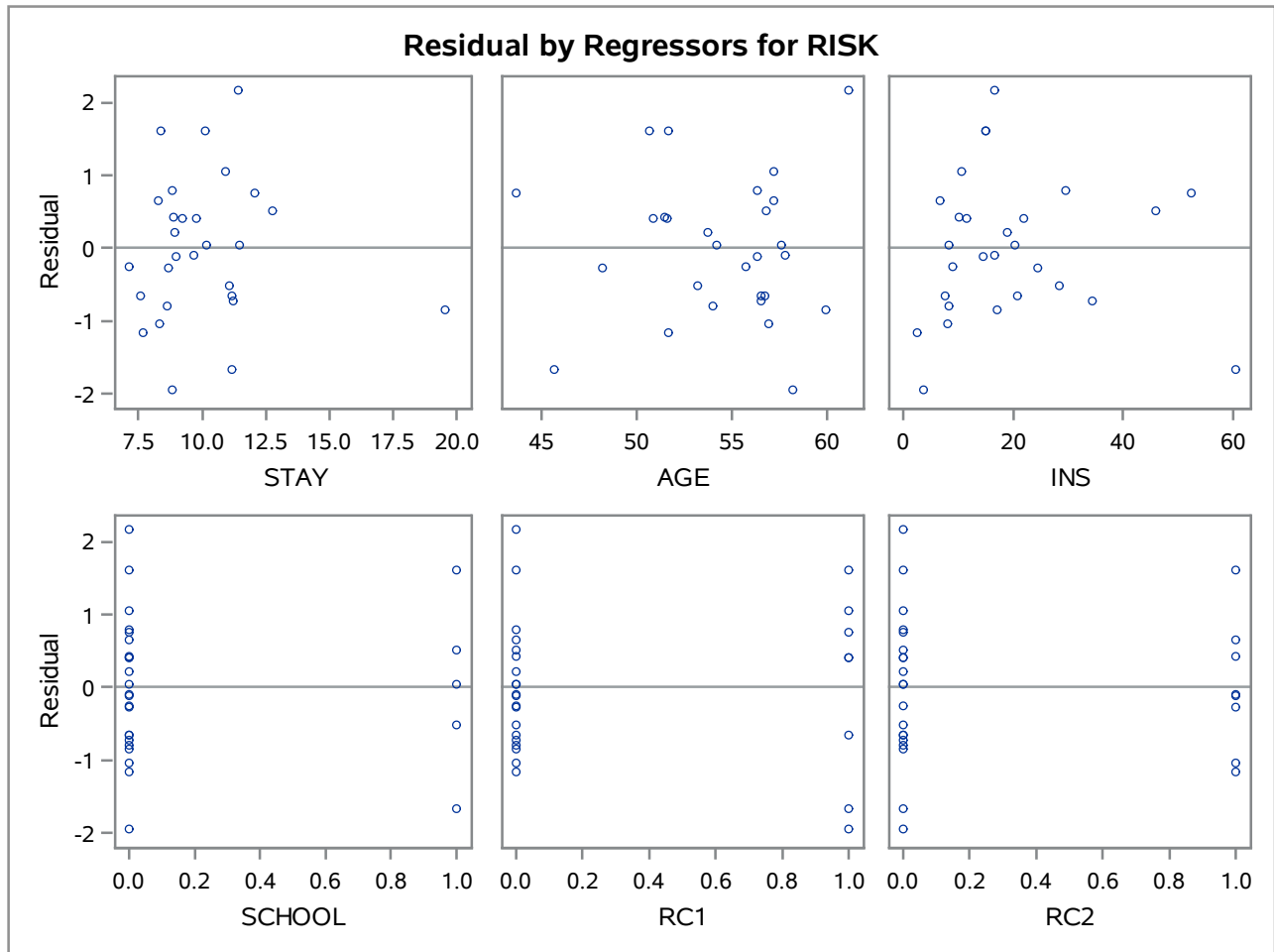
The REG Procedure
 Model: MODEL1
 Dependent Variable: RISK

Fit Diagnostics for RISK

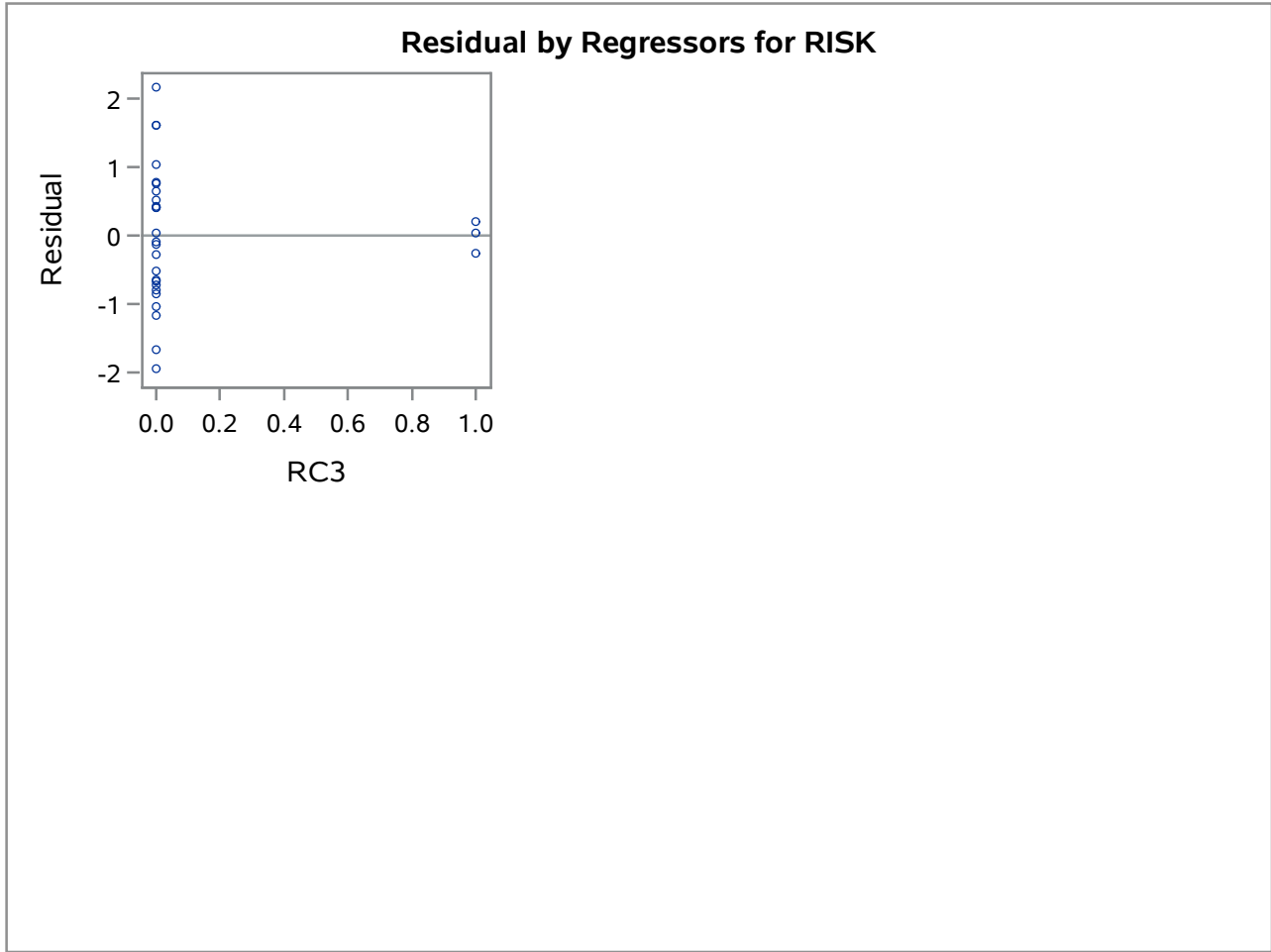


Observations	28
Parameters	8
Error DF	20
MSE	1.2773
R-Square	0.6072
Adj R-Square	0.4698

The REG Procedure
Model: MODEL1
Dependent Variable: RISK

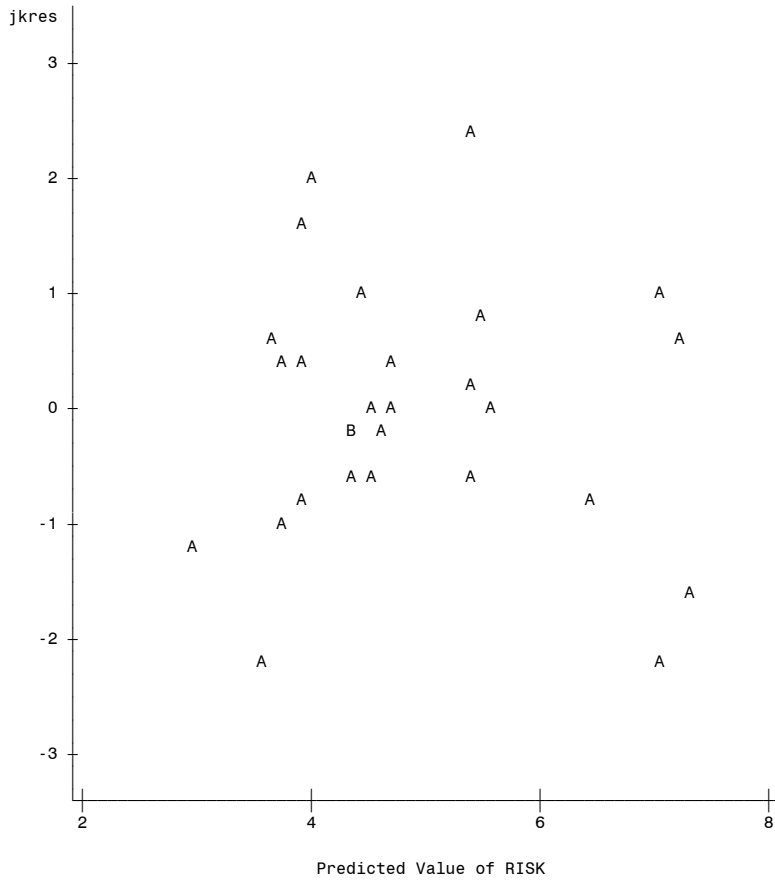


The REG Procedure
Model: MODEL1
Dependent Variable: RISK



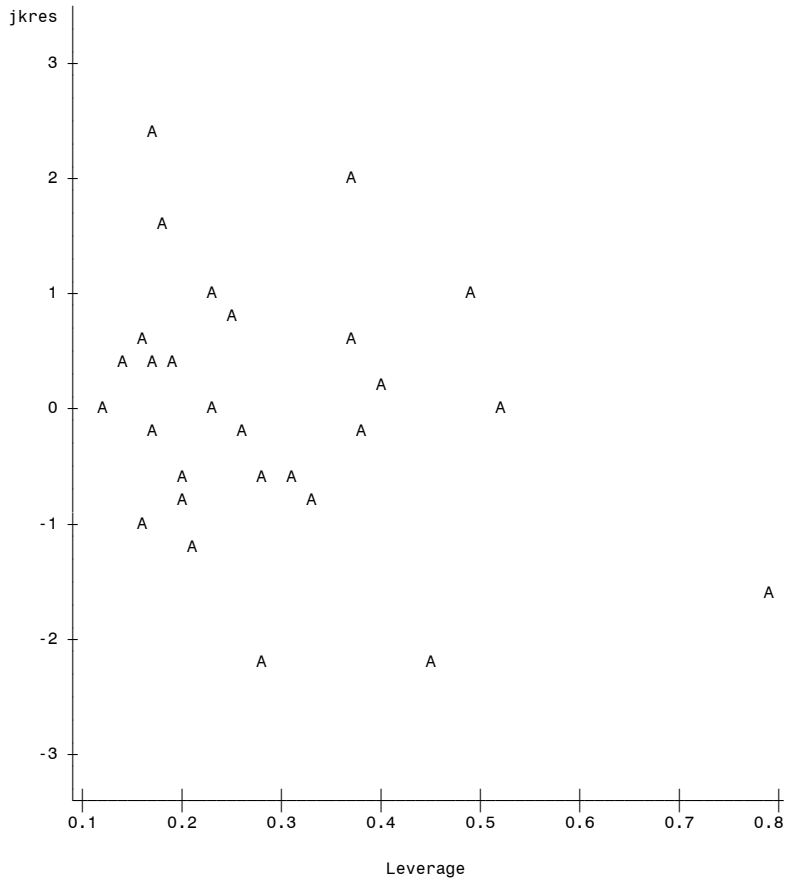
Problem 13.67

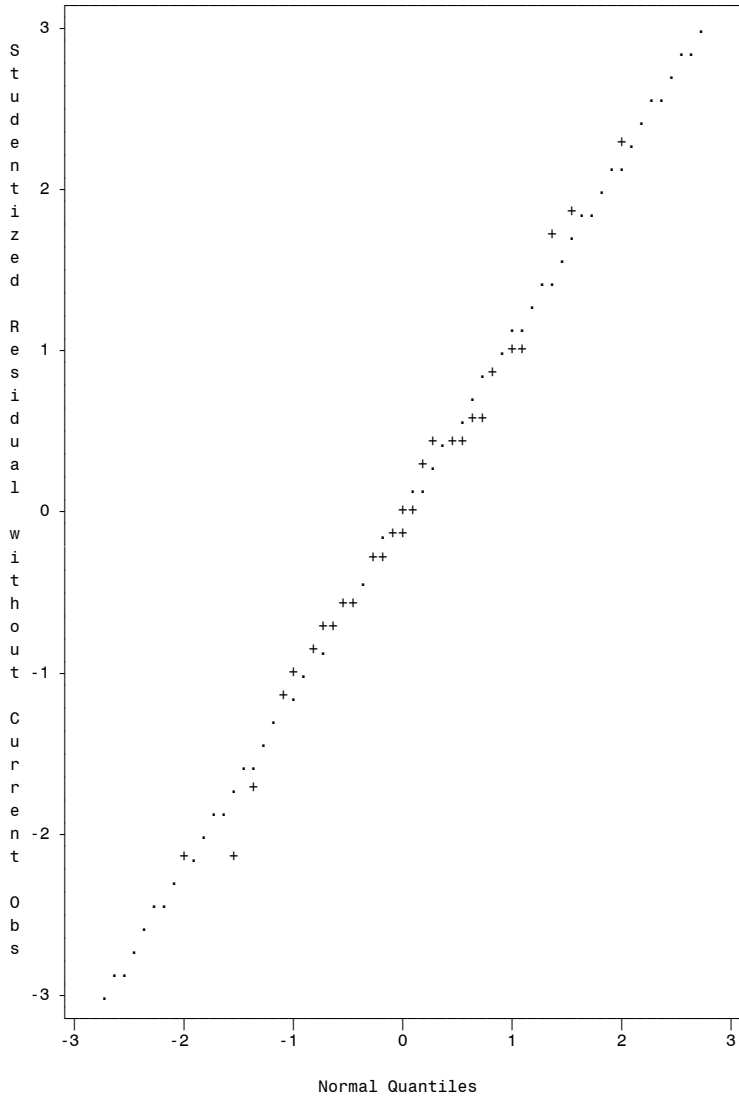
Plot of $jkres \cdot pred.$ Legend: A = 1 obs, B = 2 obs, etc.



Problem 13.67

Plot of $jkres \cdot \hat{h}$. Legend: A = 1 obs, B = 2 obs, etc.





Normal Line: ... Mu=-0.035, Sigma=1.103

**The REG Procedure
Model: MODEL1
Dependent Variable: RISK**

Number of Observations Read	28
Number of Observations Used	28

Stepwise Selection: Step 1

Statistics for Entry DF = 1,26				
Variable	Tolerance	Model R-Square	F Value	Pr > F
STAY	1.000000	0.3384	13.30	0.0012
AGE	1.000000	0.0036	0.09	0.7616
INS	1.000000	0.4127	18.27	0.0002
SCHOOL	1.000000	0.0563	1.55	0.2240
RC1	1.000000	0.0000	0.00	0.9970
RC2	1.000000	0.1400	4.23	0.0498
RC3	1.000000	0.0005	0.01	0.9108

Variable INS Entered: R-Square = 0.4127 and C(p) = 5.9075

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	26.84309	26.84309	18.27	0.0002
Error	26	38.20119	1.46928		
Corrected Total	27	65.04429			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	3.52251	0.38861	120.72001	82.16	<.0001
INS	0.06959	0.01628	26.84309	18.27	0.0002

Bounds on condition number: 1, 1

Stepwise Selection: Step 2

Statistics for Entry DF = 1,25				
Variable	Tolerance	Model R-Square	F Value	Pr > F
STAY	0.877402	0.5578	8.20	0.0084
AGE	0.776808	0.4890	3.73	0.0647
SCHOOL	0.831769	0.4135	0.04	0.8528
RC1	0.943133	0.4378	1.12	0.3006

The REG Procedure
 Model: MODEL1
 Dependent Variable: RISK

Stepwise Selection: Step 2

Statistics for Entry DF = 1,25				
Variable	Tolerance	Model R-Square	F Value	Pr > F
RC2	0.900445	0.4454	1.47	0.2363
RC3	0.968735	0.4213	0.37	0.5471

Variable STAY Entered: R-Square = 0.5578 and C(p) = 0.5197

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	36.27961	18.13981	15.77	<.0001
Error	25	28.76467	1.15059		
Corrected Total	27	65.04429			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	1.15124	0.89658	1.89699	1.65	0.2109
STAY	0.26598	0.09288	9.43652	8.20	0.0084
INS	0.05416	0.01538	14.26928	12.40	0.0017

Bounds on condition number: 1.1397, 4.5589

Stepwise Selection: Step 3

Statistics for Removal DF = 1,25				
Variable	Partial R-Square	Model R-Square	F Value	Pr > F
STAY	0.1451	0.4127	8.20	0.0084
INS	0.2194	0.3384	12.40	0.0017

Statistics for Entry DF = 1,24				
Variable	Tolerance	Model R-Square	F Value	Pr > F
AGE	0.640674	0.5743	0.93	0.3438
SCHOOL	0.827353	0.5610	0.18	0.6792
RC1	0.912694	0.5662	0.46	0.5023
RC2	0.847550	0.5661	0.46	0.5044
RC3	0.949664	0.5796	1.25	0.2753

**The REG Procedure
 Model: MODEL1
 Dependent Variable: RISK**

Stepwise Selection: Step 3

**All variables left in the model are significant at the 0.1500 level.
 No other variable met the 0.1500 significance level for entry into the model.**

Summary of Stepwise Selection								
Step	Variable Entered	Variable Removed	Number Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	INS		1	0.4127	0.4127	5.9075	18.27	0.0002
2	STAY		2	0.1451	0.5578	0.5197	8.20	0.0084

Problem 13.67

**The REG Procedure
Model: MODEL1
Dependent Variable: RISK**

Number of Observations Read	28
Number of Observations Used	28

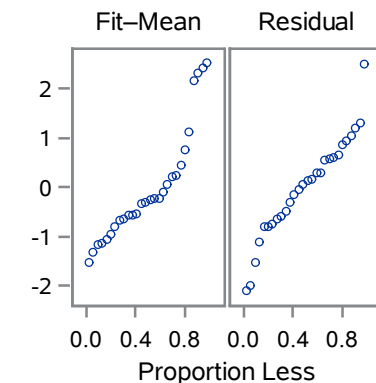
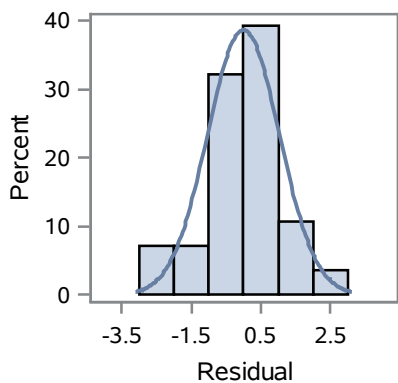
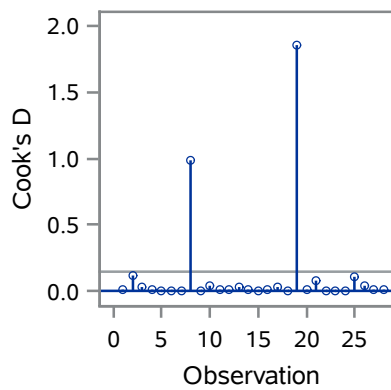
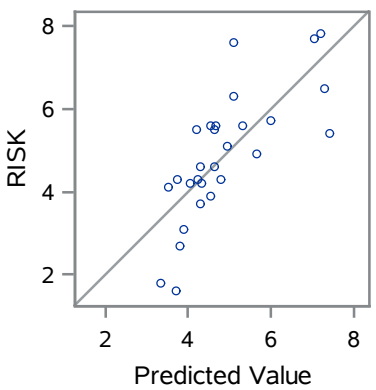
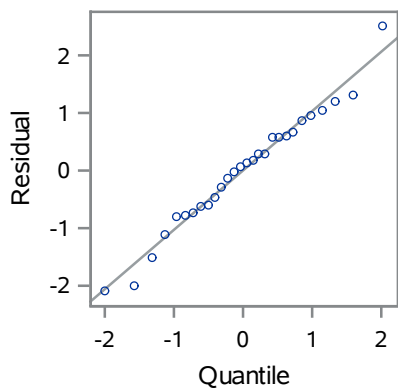
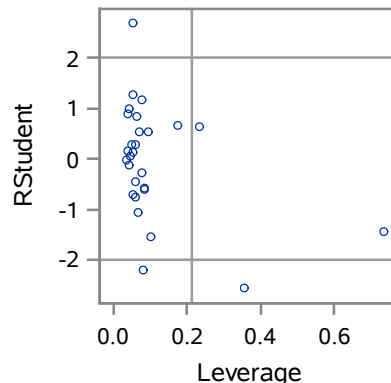
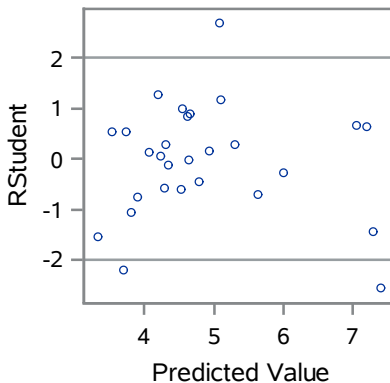
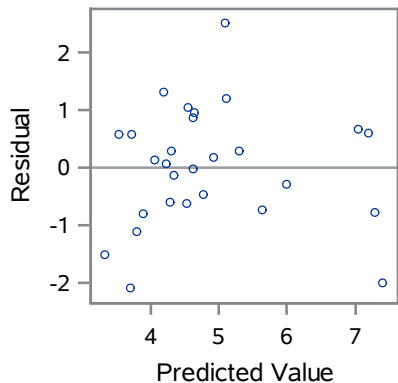
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	36.27961	18.13981	15.77	<.0001
Error	25	28.76467	1.15059		
Corrected Total	27	65.04429			

Root MSE	1.07265	R-Square	0.5578
Dependent Mean	4.86429	Adj R-Sq	0.5224
Coeff Var	22.05163		

Parameter Estimates						
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t	Variance Inflation
Intercept	1	1.15124	0.89658	1.28	0.2109	0
STAY	1	0.26598	0.09288	2.86	0.0084	1.13973
INS	1	0.05416	0.01538	3.52	0.0017	1.13973

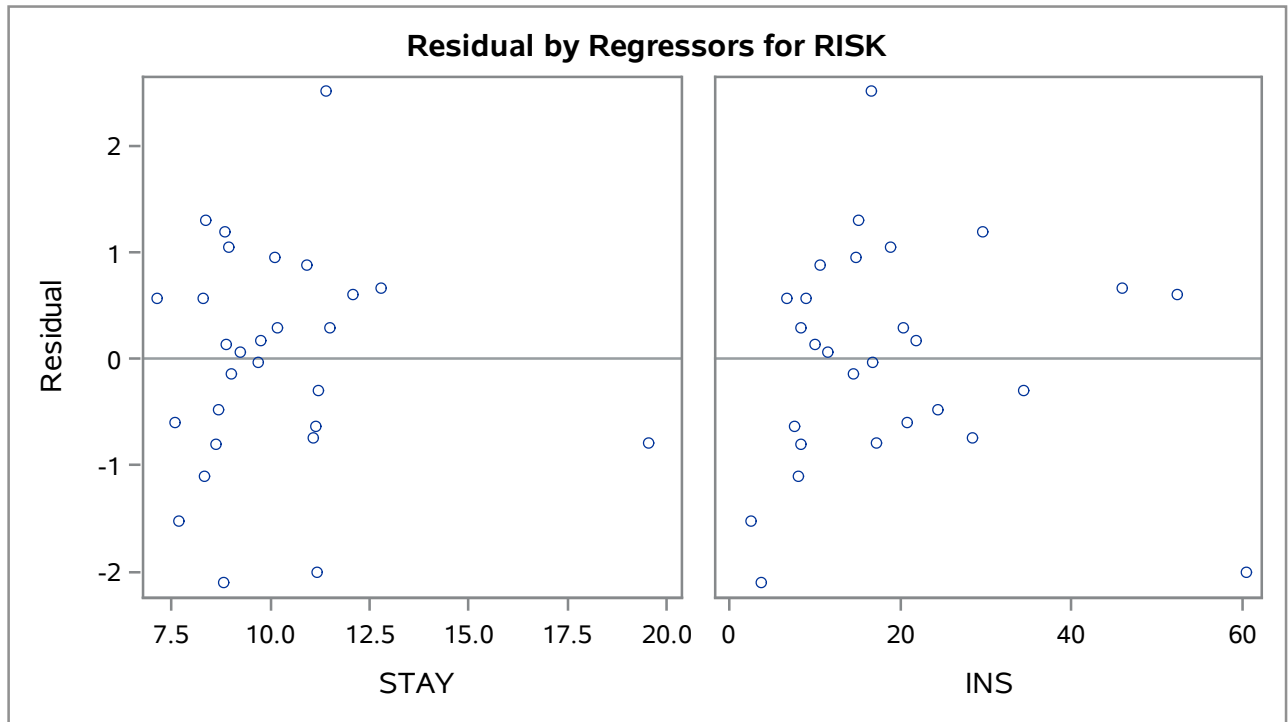
The REG Procedure
 Model: MODEL1
 Dependent Variable: RISK

Fit Diagnostics for RISK



Observations	28
Parameters	3
Error DF	25
MSE	1.1506
R-Square	0.5578
Adj R-Square	0.5224

The REG Procedure
Model: MODEL1
Dependent Variable: RISK



**The REG Procedure
Model: MODEL1
Dependent Variable: RISK**

R-Square Selection Method

Number of Observations Read	28
Number of Observations Used	28

Number in Model	R-Square	C(p)	AIC	SBC	Variables in Model
1	0.4127	5.9075	12.6985	15.36295	INS
1	0.3384	9.6910	16.0340	18.69838	STAY
1	0.1400	19.7922	23.3762	26.04064	RC2
1	0.0563	24.0553	25.9773	28.64175	SCHOOL
1	0.0036	26.7394	27.4992	30.16359	AGE
2	0.5578	0.5197	6.7544	10.75103	STAY INS
2	0.4890	4.0211	10.8009	14.79749	AGE INS
2	0.4454	6.2440	13.0961	17.09276	INS RC2
2	0.4378	6.6281	13.4743	17.47095	INS RC1
2	0.4213	7.4683	14.2843	18.28094	INS RC3
3	0.5796	1.4077	7.3365	12.66536	STAY INS RC3
3	0.5743	1.6772	7.6869	13.01567	STAY AGE INS
3	0.5662	2.0927	8.2184	13.54722	STAY INS RC1
3	0.5661	2.0967	8.2235	13.55229	STAY INS RC2
3	0.5610	2.3564	8.5507	13.87951	STAY INS SCHOOL
4	0.5969	2.5252	8.1578	14.81885	STAY AGE INS RC3
4	0.5889	2.9321	8.7074	15.36840	STAY INS SCHOOL RC3
4	0.5863	3.0670	8.8874	15.54837	STAY INS RC1 RC2
4	0.5833	3.2176	9.0867	15.74776	STAY INS RC1 RC3
4	0.5815	3.3125	9.2117	15.87277	STAY INS RC2 RC3
5	0.6042	4.1539	9.6466	17.63987	STAY AGE INS SCHOOL RC3
5	0.5975	4.4980	10.1206	18.11385	STAY AGE INS RC1 RC3
5	0.5972	4.5095	10.1363	18.12954	STAY AGE INS RC2 RC3
5	0.5949	4.6296	10.2998	18.29301	STAY INS SCHOOL RC1 RC3
5	0.5926	4.7477	10.4596	18.45287	STAY INS SCHOOL RC1 RC2
6	0.6058	6.0717	11.5322	20.85766	STAY AGE INS SCHOOL RC1 RC3
6	0.6042	6.1529	11.6452	20.97064	STAY AGE INS SCHOOL RC2 RC3
6	0.6011	6.3115	11.8648	21.19022	STAY INS SCHOOL RC1 RC2 RC3
6	0.5992	6.4102	12.0005	21.32589	STAY AGE INS RC1 RC2 RC3
6	0.5950	6.6234	12.2915	21.61691	STAY AGE INS SCHOOL RC1 RC2
7	0.6072	8.0000	13.4320	24.08963	STAY AGE INS SCHOOL RC1 RC2 RC3

**The REG Procedure
Model: MODEL1
Dependent Variable: RISK**

**The REG Procedure
Model: MODEL1
Dependent Variable: RISK**

Number of Observations Read	28
Number of Observations Used	28

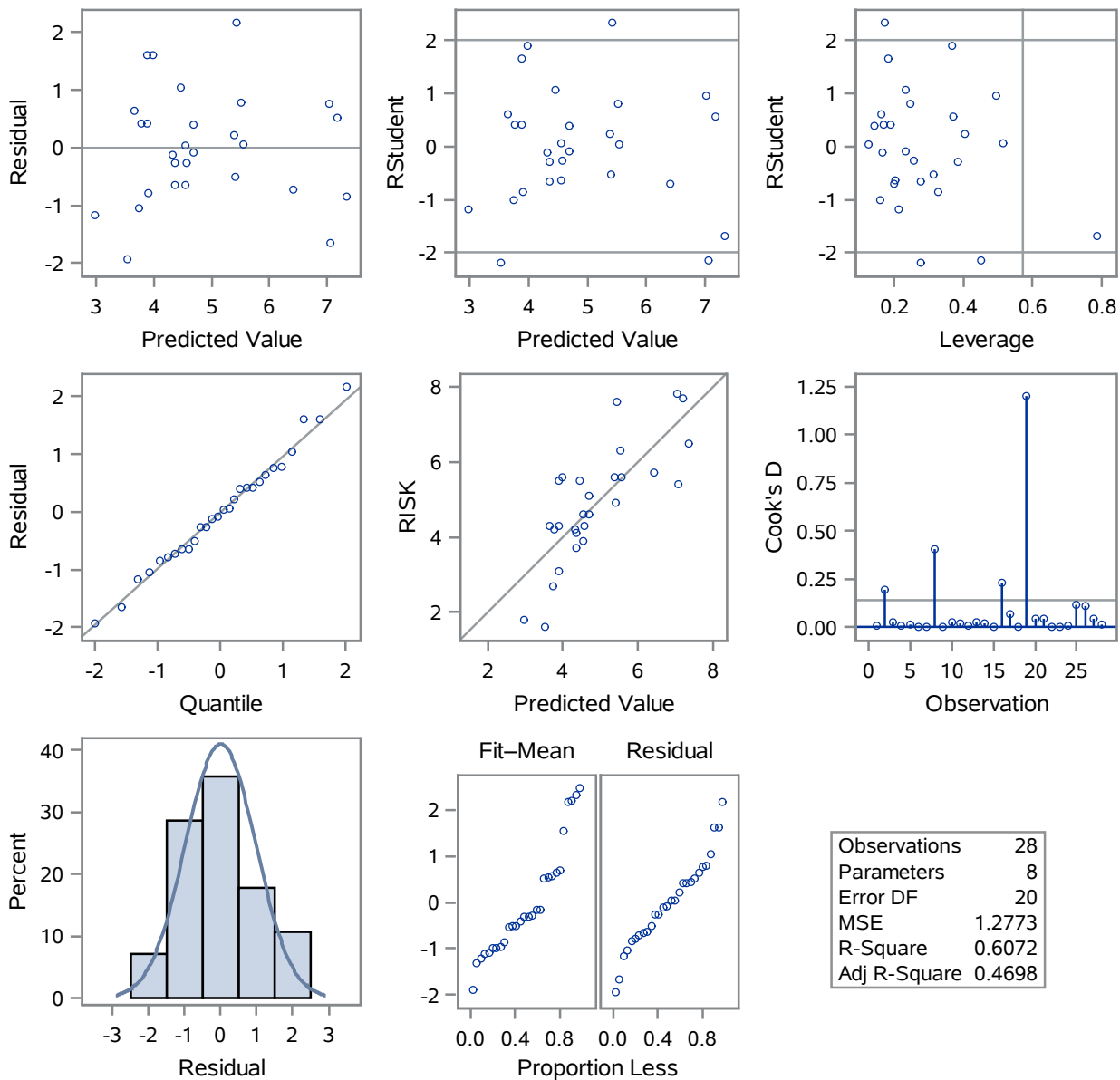
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	39.49805	5.64258	4.42	0.0041
Error	20	25.54623	1.27731		
Corrected Total	27	65.04429			

Root MSE	1.13018	R-Square	0.6072
Dependent Mean	4.86429	Adj R-Sq	0.4698
Coeff Var	23.23429		

Parameter Estimates						
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t	Variance Inflation
Intercept	1	-1.07801	4.69135	-0.23	0.8206	0
STAY	1	0.23613	0.11569	2.04	0.0547	1.59298
AGE	1	0.04360	0.07811	0.56	0.5829	2.14702
INS	1	0.06924	0.02278	3.04	0.0065	2.25270
SCHOOL	1	-0.41517	0.64823	-0.64	0.5291	1.35113
RC1	1	-0.26956	0.68941	-0.39	0.6999	2.12630
RC2	1	-0.19268	0.71943	-0.27	0.7916	2.31552
RC3	1	0.70243	0.88962	0.79	0.4390	1.65966

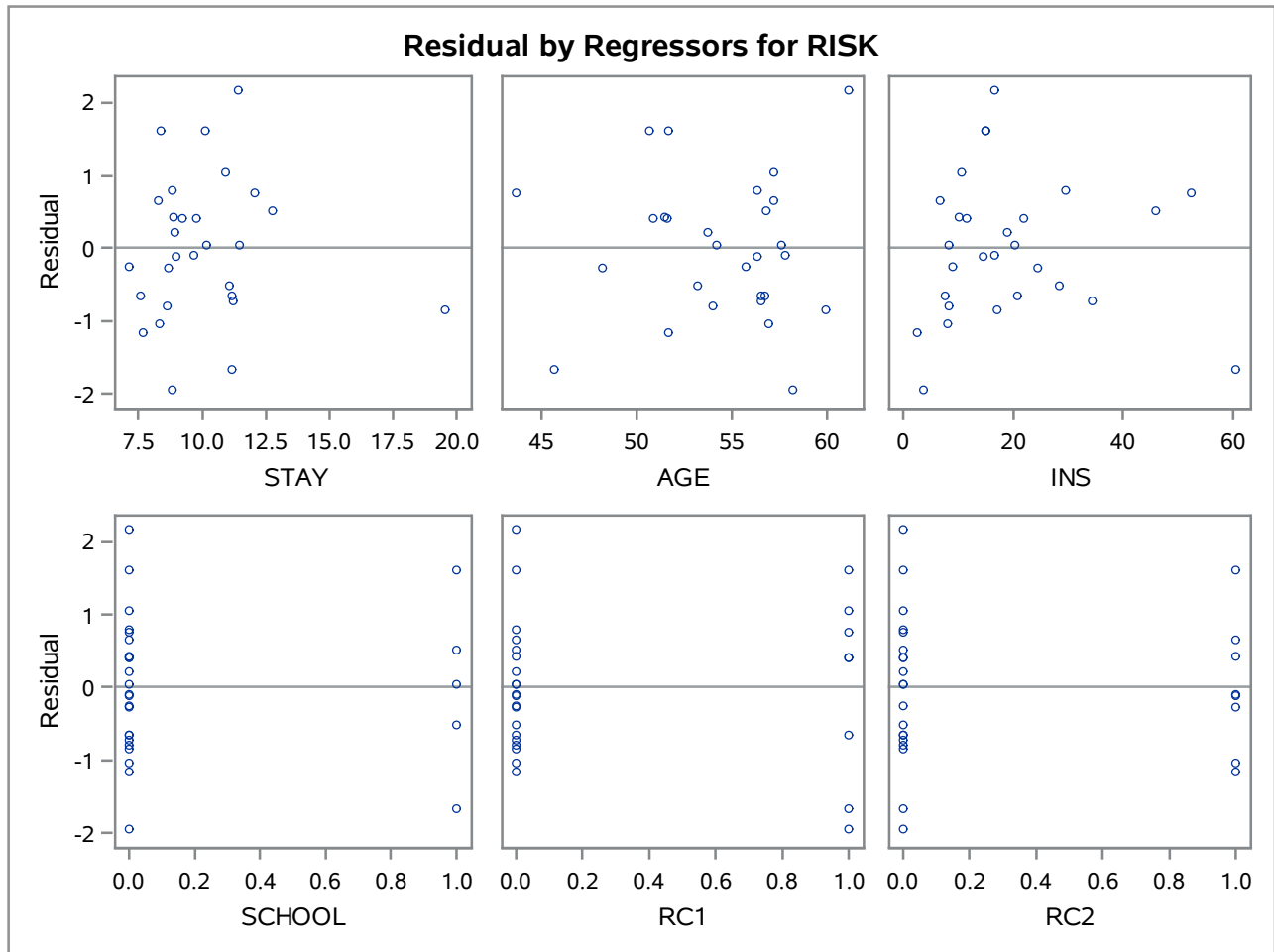
The REG Procedure
 Model: MODEL1
 Dependent Variable: RISK

Fit Diagnostics for RISK

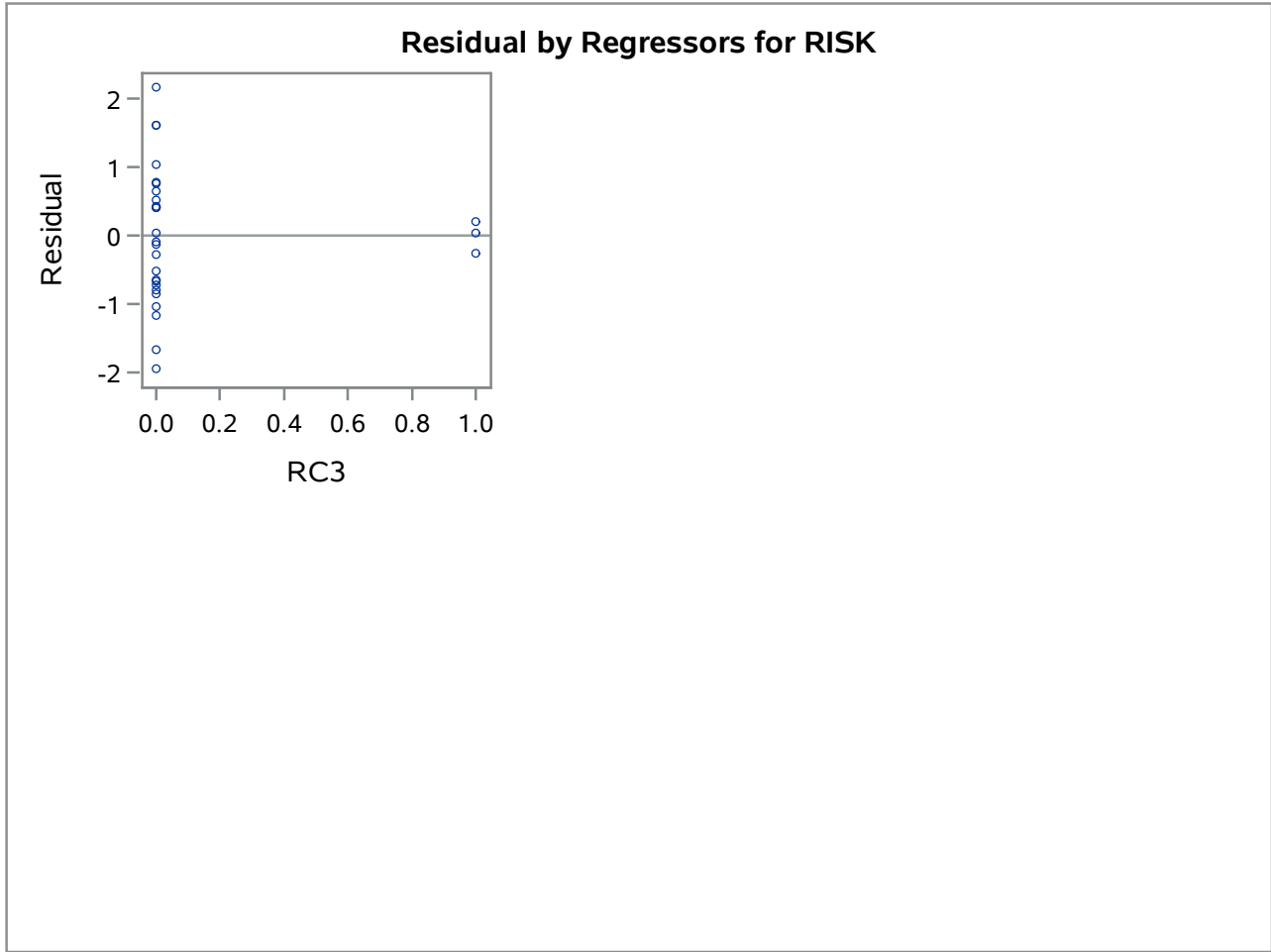


Observations	28
Parameters	8
Error DF	20
MSE	1.2773
R-Square	0.6072
Adj R-Square	0.4698

The REG Procedure
Model: MODEL1
Dependent Variable: RISK

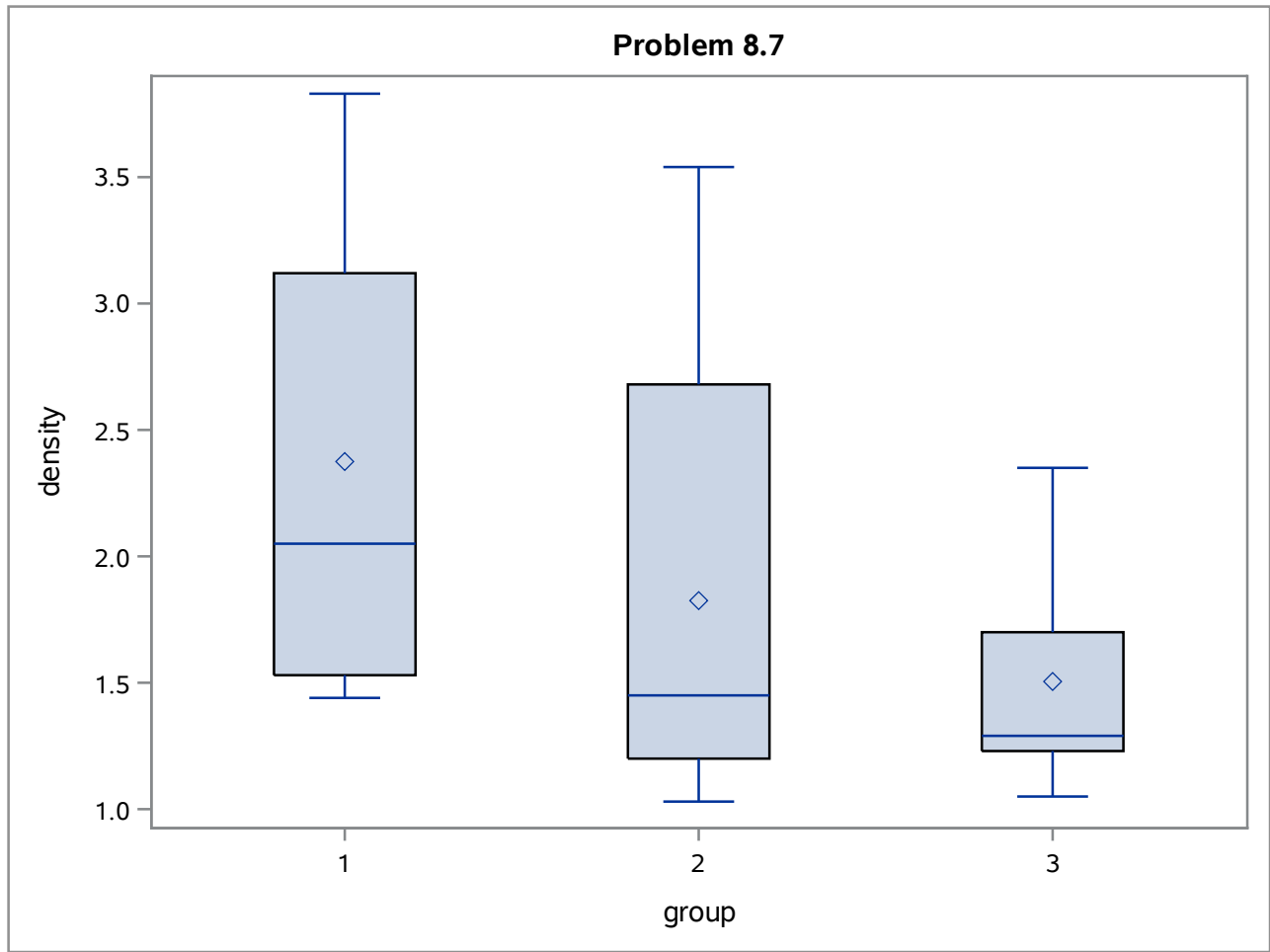


The REG Procedure
Model: MODEL1
Dependent Variable: RISK



Problem 8.7

Obs	group	density
1	1	2.05
2	2	1.20
3	3	1.23
4	1	3.05
5	2	1.48
6	3	1.66
7	1	3.12
8	2	3.54
9	3	1.70
10	1	1.59
11	2	1.03
12	3	1.29
13	1	3.83
14	2	1.45
15	3	1.26
16	1	1.53
17	2	1.40
18	3	1.05
19	1	1.44
20	2	2.68
21	3	2.35



The GLM Procedure

Class Level Information		
Class	Levels	Values
group	3	1 2 3

Number of Observations Read	21
Number of Observations Used	21

The GLM Procedure

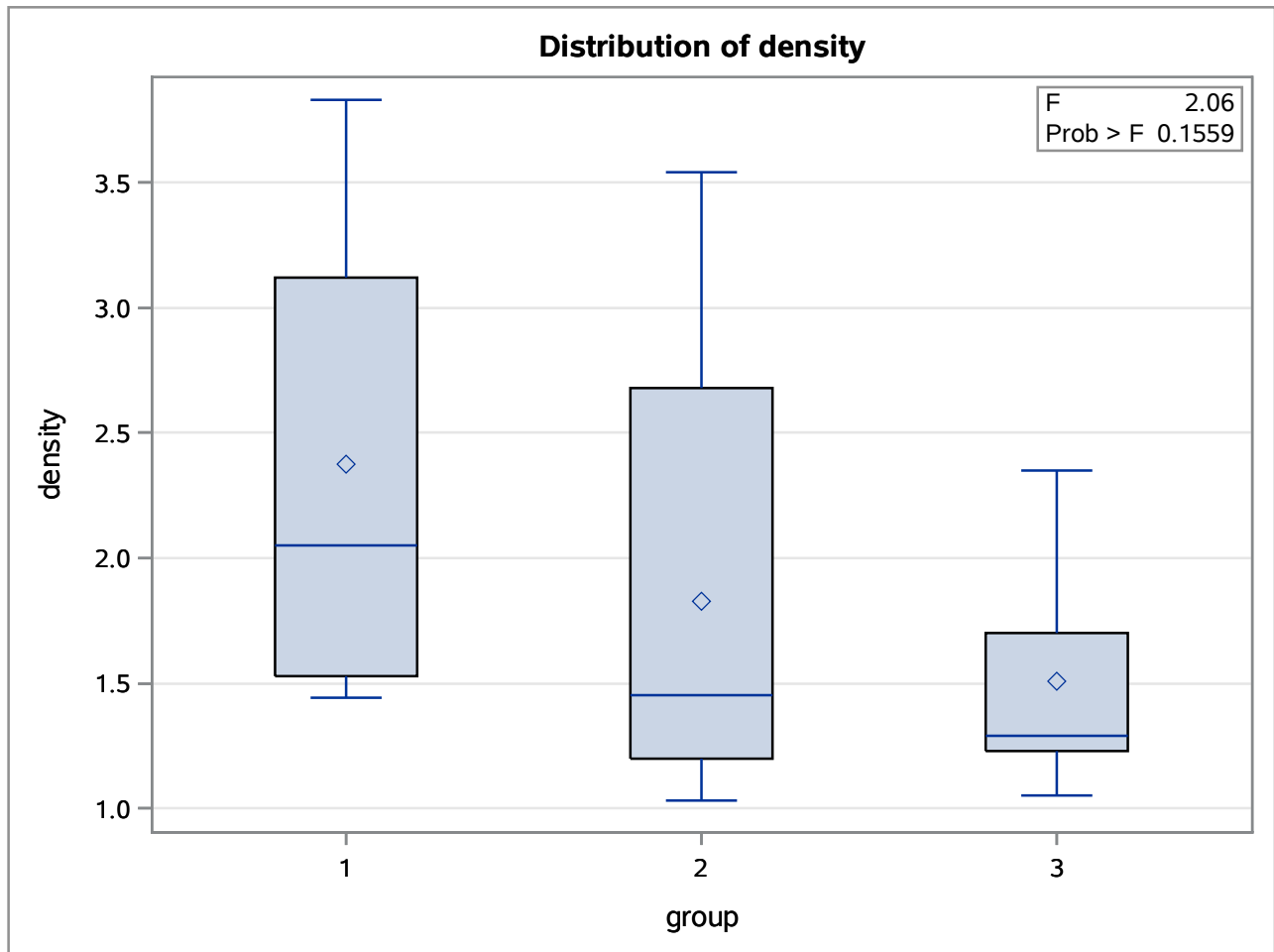
Dependent Variable: density

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	2.69197143	1.34598571	2.06	0.1559
Error	18	11.73788571	0.65210476		
Corrected Total	20	14.42985714			

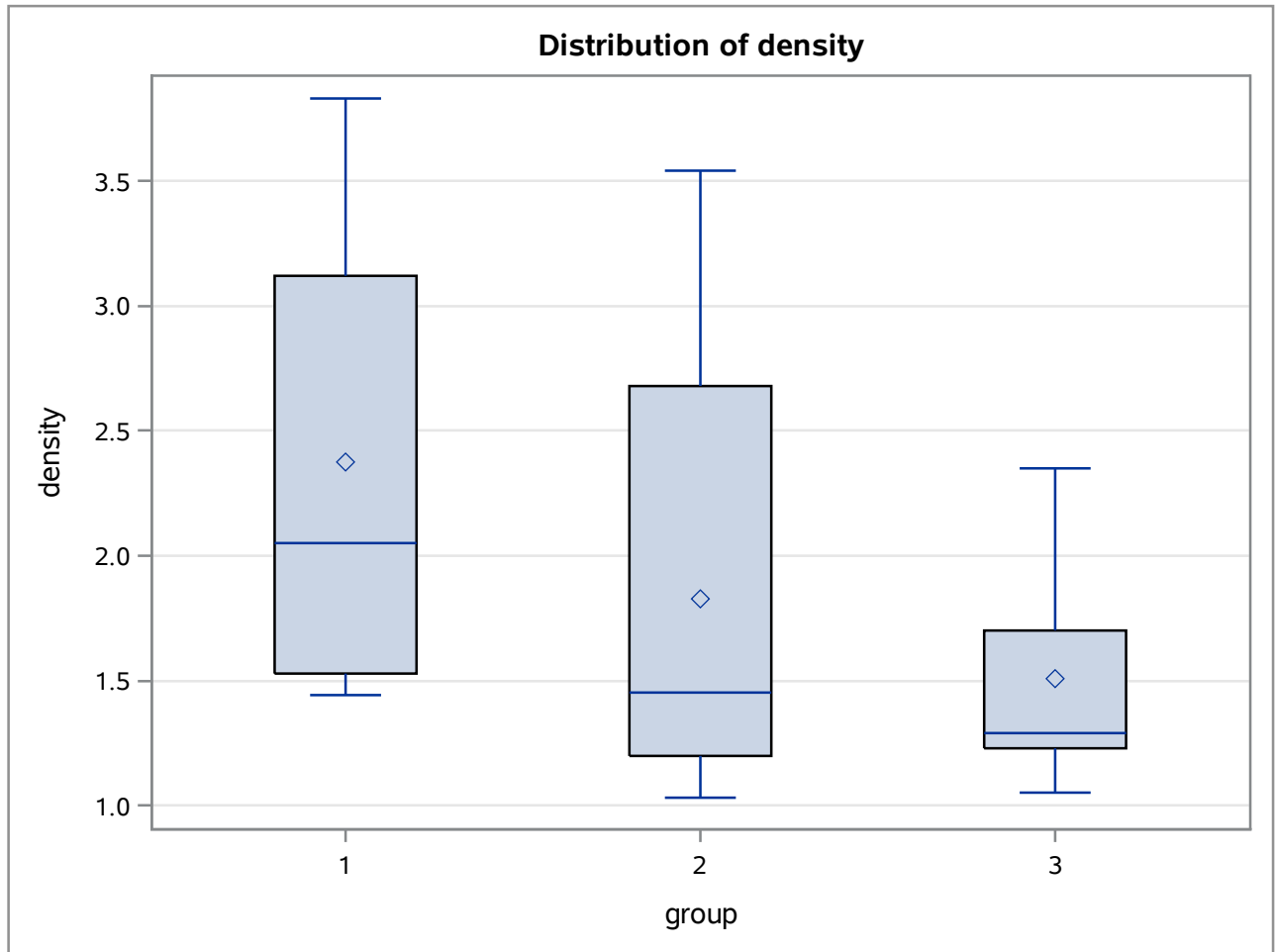
R-Square	Coeff Var	Root MSE	density Mean
0.186556	42.46965	0.807530	1.901429

Source	DF	Type I SS	Mean Square	F Value	Pr > F
group	2	2.69197143	1.34598571	2.06	0.1559

Source	DF	Type III SS	Mean Square	F Value	Pr > F
group	2	2.69197143	1.34598571	2.06	0.1559



The GLM Procedure



The GLM Procedure

t Confidence Intervals for density

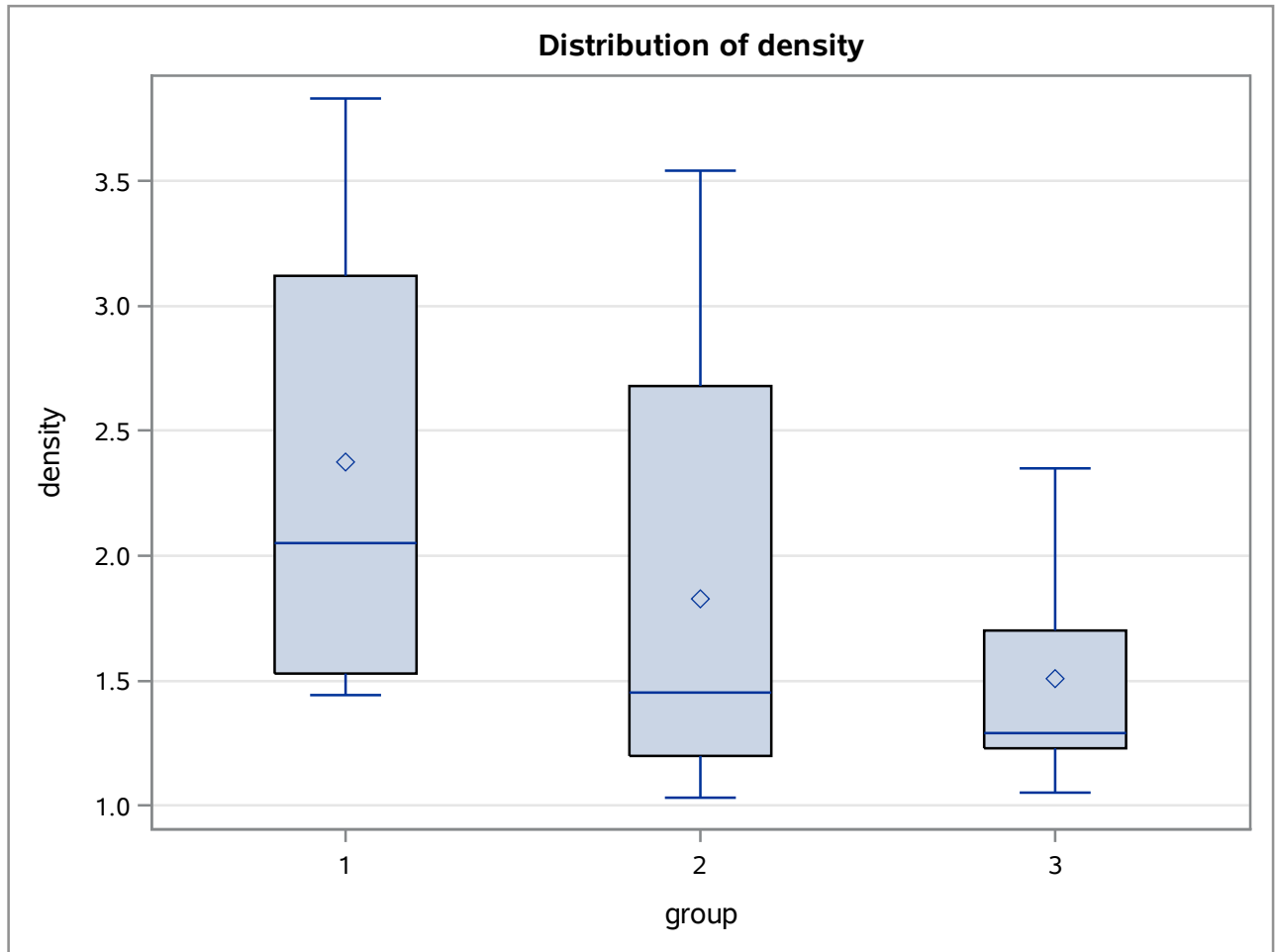
Alpha	0.05
Error Degrees of Freedom	18
Error Mean Square	0.652105
Critical Value of t	2.10092
Half Width of Confidence Interval	0.641239

group	N	Mean	95% Confidence Limits	
1	7	2.3729	1.7316	3.0141
2	7	1.8257	1.1845	2.4670
3	7	1.5057	0.8645	2.1470

The GLM Procedure

Levene's Test for Homogeneity of density Variance ANOVA of Squared Deviations from Group Means					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
group	2	1.6243	0.8122	1.65	0.2194
Error	18	8.8484	0.4916		

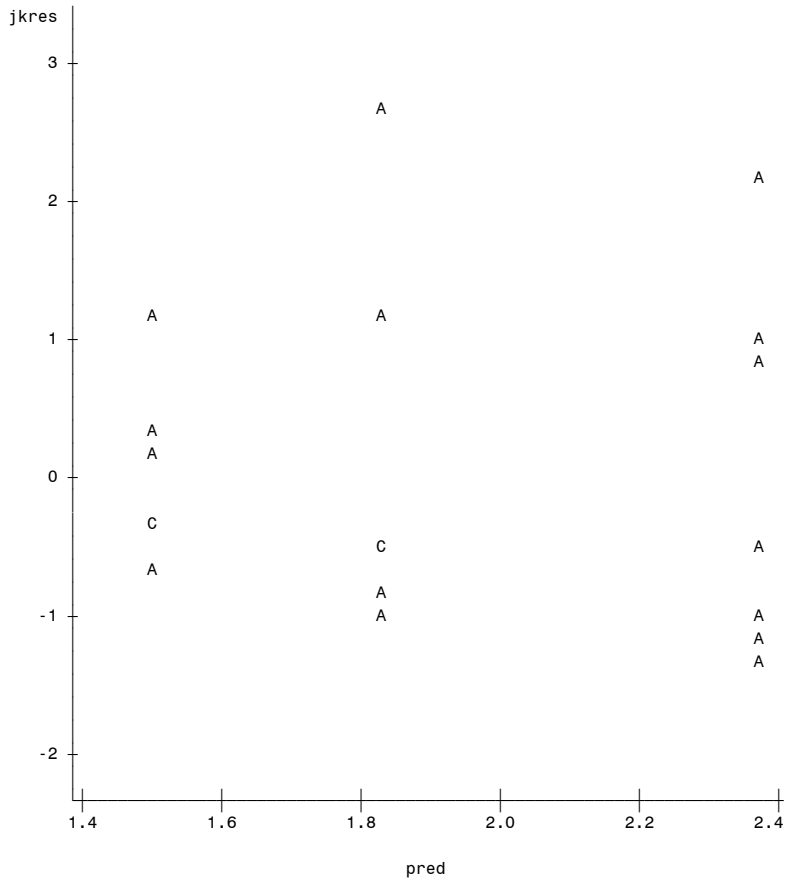
The GLM Procedure



Level of group	N	density	
		Mean	Std Dev
1	7	2.37285714	0.95199290
2	7	1.82571429	0.92512805
3	7	1.50571429	0.44063807

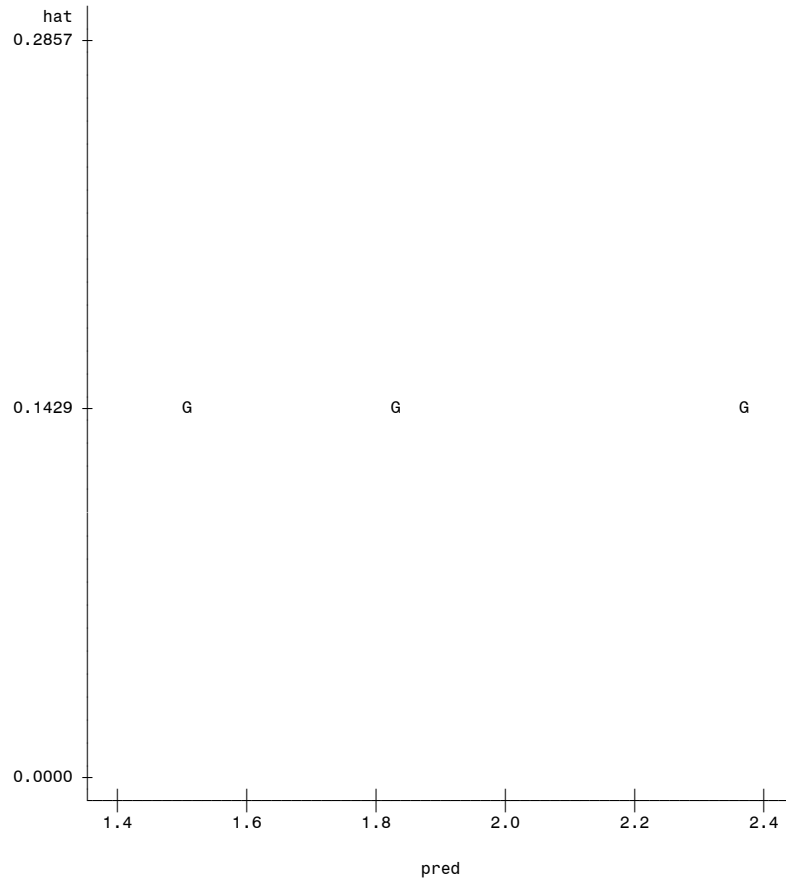
Problem 8.7

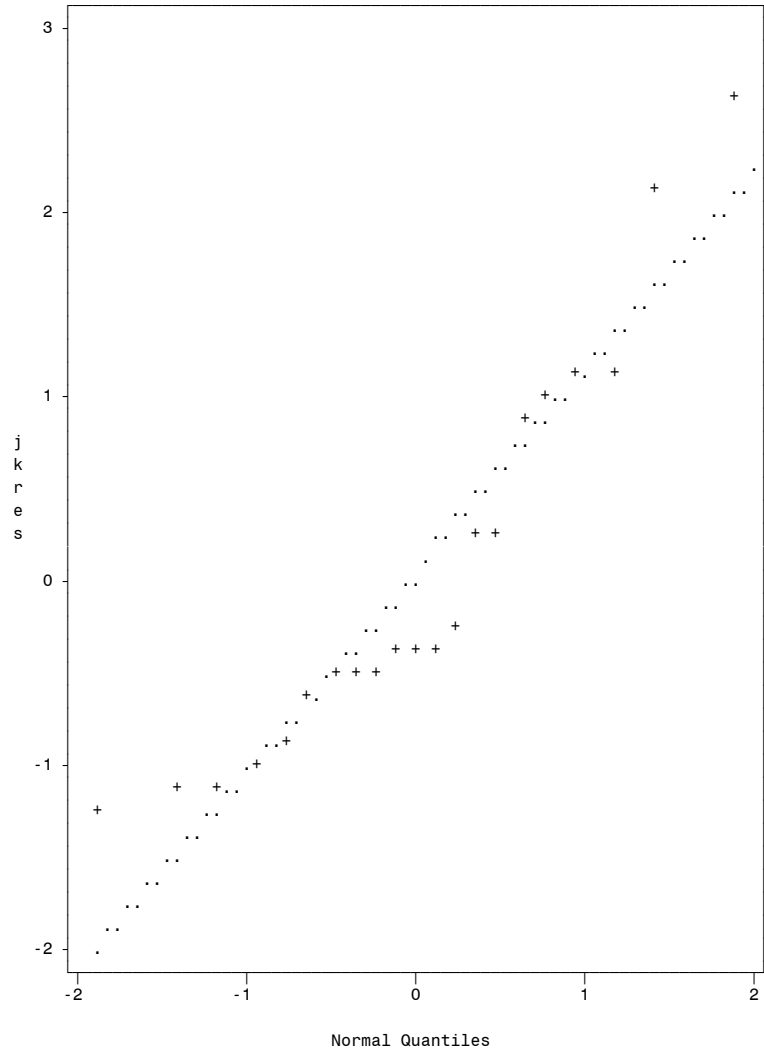
Plot of $jkres \cdot pred$. Legend: A = 1 obs, B = 2 obs, etc.



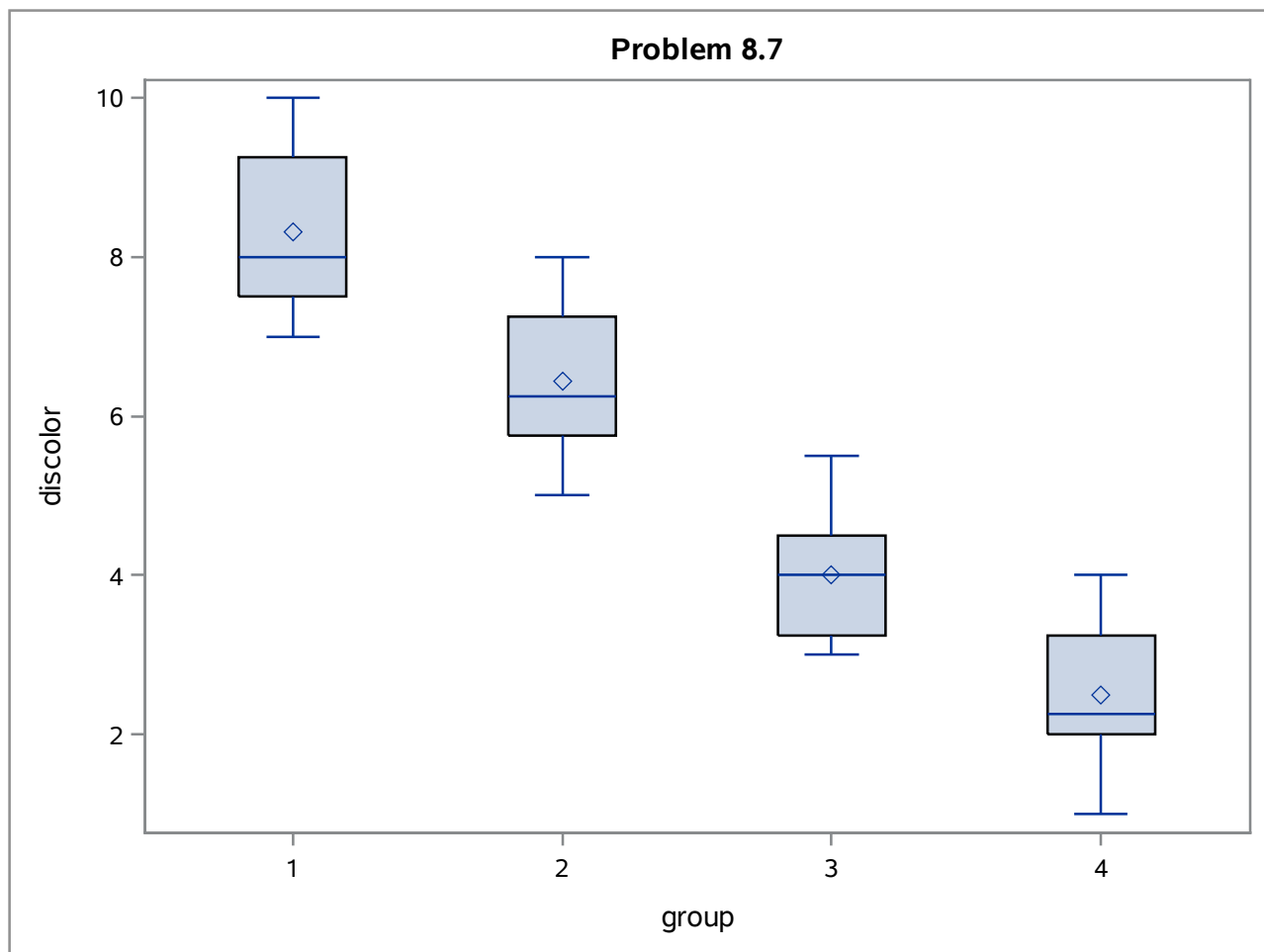
Problem 8.7

Plot of \hat{y} *pred. Legend: A = 1 obs, B = 2 obs, etc.





Normal Line: ... Mu=0.0281, Sigma=1.0846



The GLM Procedure

Class Level Information		
Class	Levels	Values
group	4	1 2 3 4

Number of Observations Read	32
Number of Observations Used	32

The GLM Procedure

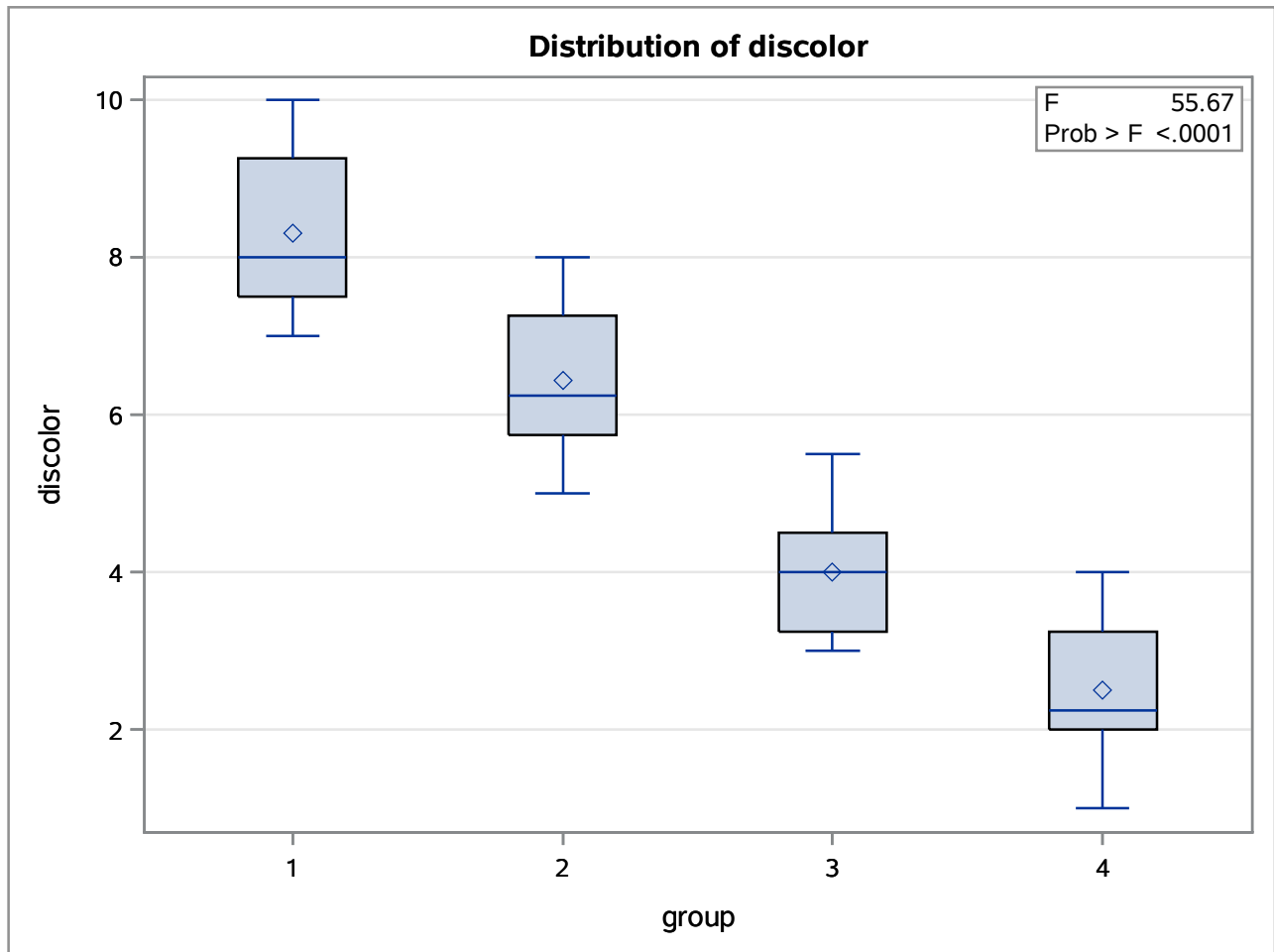
Dependent Variable: discolor

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	159.1875000	53.0625000	55.67	<.0001
Error	28	26.6875000	0.9531250		
Corrected Total	31	185.8750000			

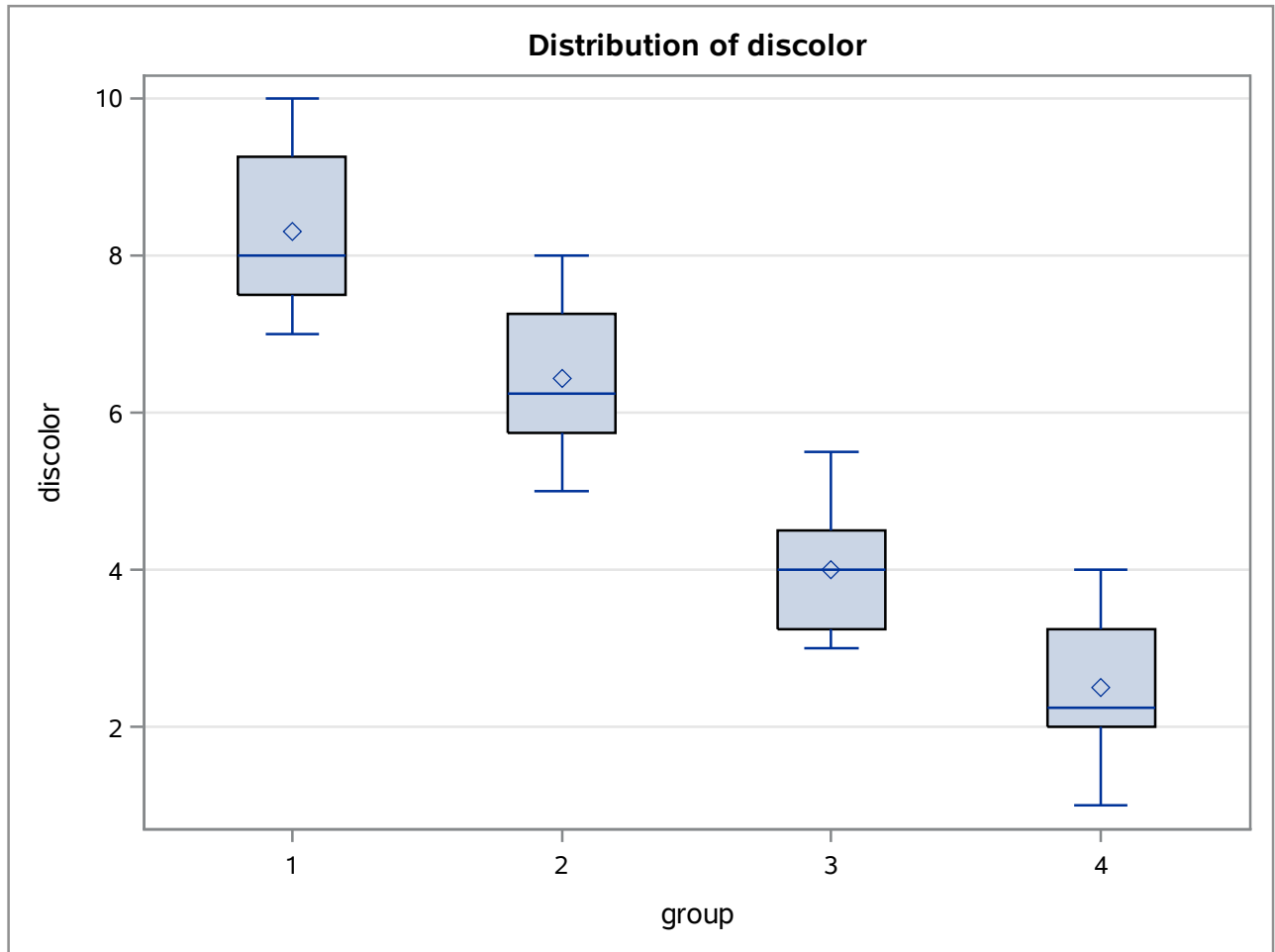
R-Square	Coeff Var	Root MSE	discolor Mean
0.856422	18.37706	0.976281	5.312500

Source	DF	Type I SS	Mean Square	F Value	Pr > F
group	3	159.1875000	53.0625000	55.67	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
group	3	159.1875000	53.0625000	55.67	<.0001



The GLM Procedure



The GLM Procedure

t Confidence Intervals for discolor

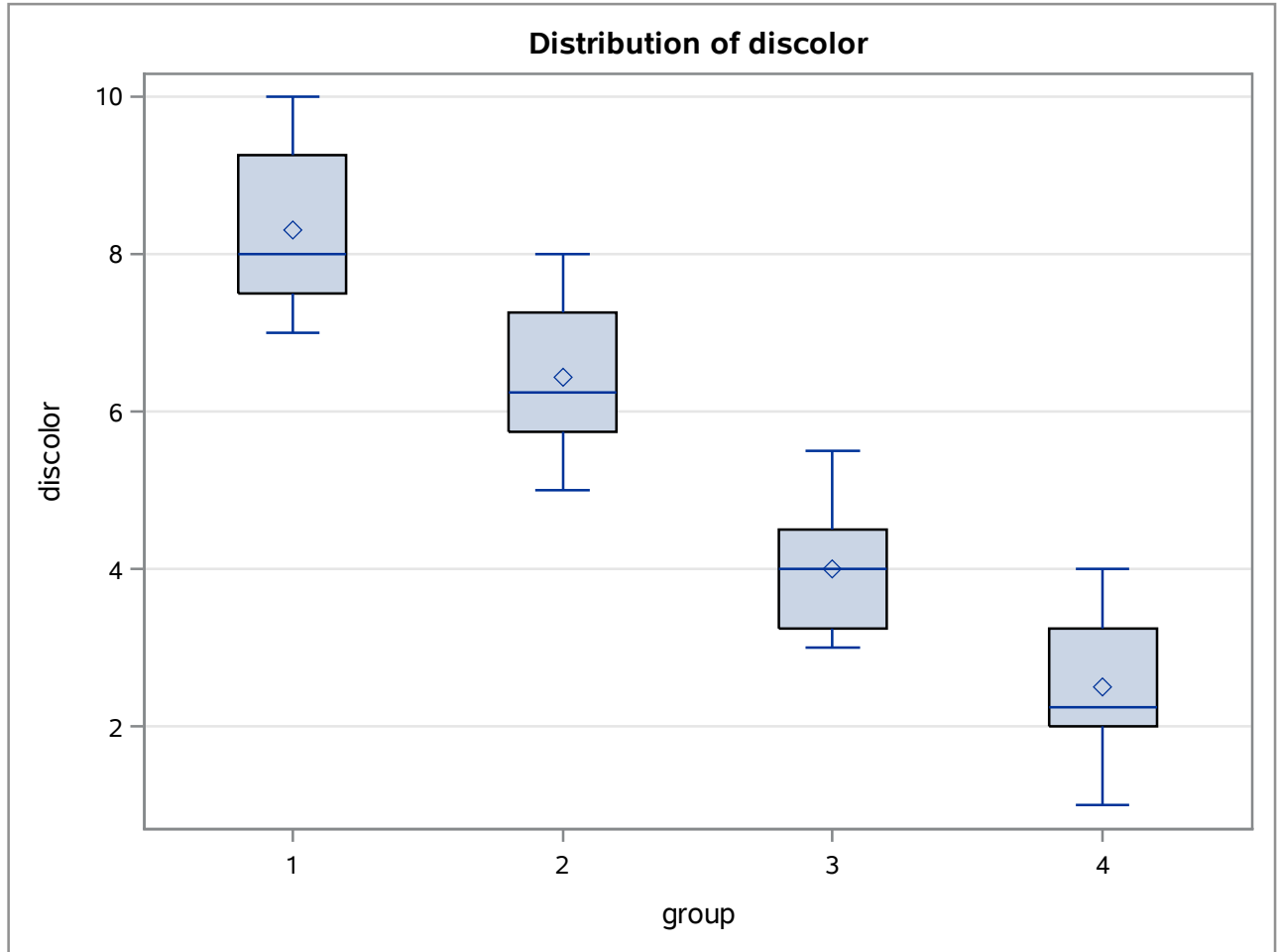
Alpha	0.05
Error Degrees of Freedom	28
Error Mean Square	0.953125
Critical Value of t	2.04841
Half Width of Confidence Interval	0.707044

group	N	Mean	95% Confidence Limits	
1	8	8.3125	7.6055	9.0195
2	8	6.4375	5.7305	7.1445
3	8	4.0000	3.2930	4.7070
4	8	2.5000	1.7930	3.2070

The GLM Procedure

Levene's Test for Homogeneity of discolor Variance ANOVA of Squared Deviations from Group Means					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
group	3	0.6007	0.2002	0.25	0.8604
Error	28	22.3975	0.7999		

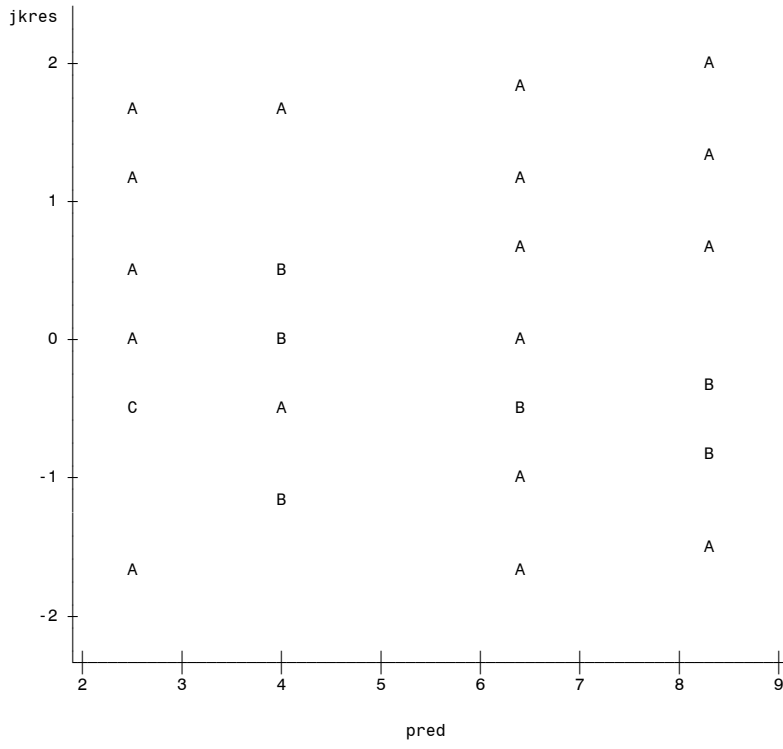
The GLM Procedure



Level of group	N	discolor	
		Mean	Std Dev
1	8	8.31250000	1.06695495
2	8	6.43750000	1.01550480
3	8	4.00000000	0.84515425
4	8	2.50000000	0.96362411

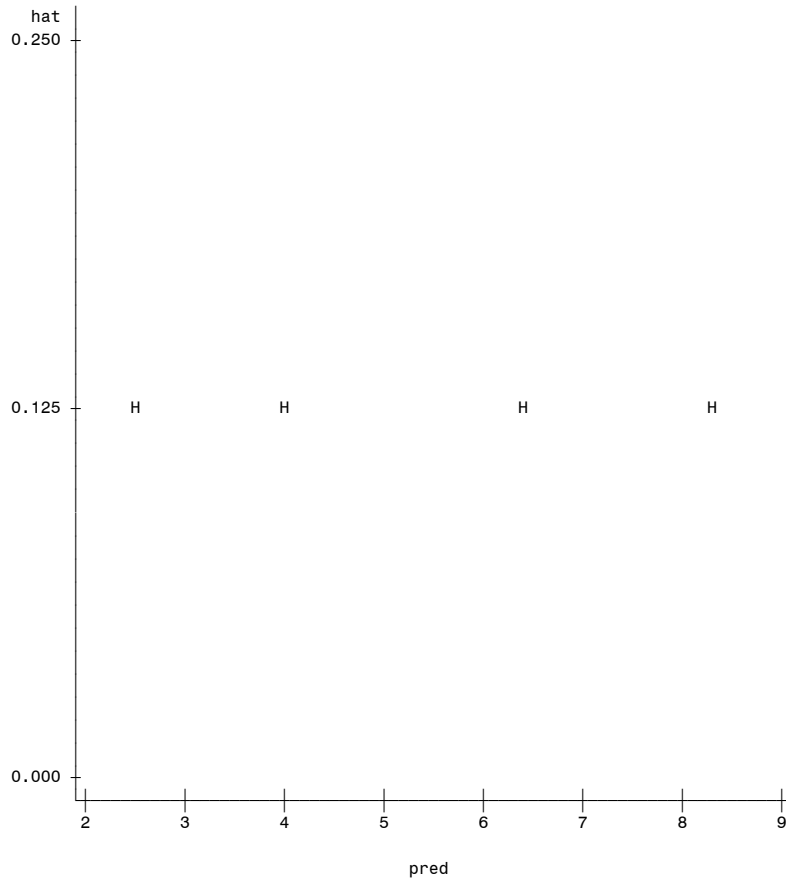
Problem 8.29

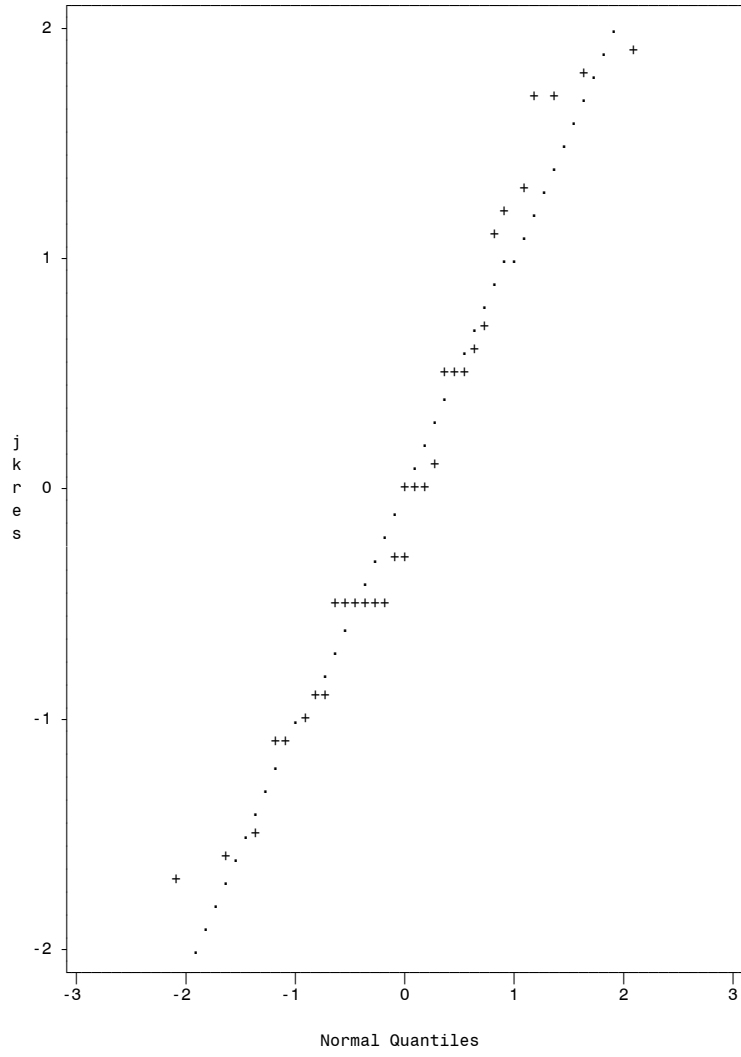
Plot of $jkres \cdot pred$. Legend: A = 1 obs, B = 2 obs, etc.



Problem 8.29

Plot of \hat{y} *pred. Legend: A = 1 obs, B = 2 obs, etc.





Normal Line: ... Mu=0.0055, Sigma=1.0367

The NPAR1WAY Procedure

Wilcoxon Scores (Rank Sums) for Variable discolor Classified by Variable group					
group	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
1	8	221.50	132.0	22.925546	27.68750
2	8	169.00	132.0	22.925546	21.12500
3	8	94.00	132.0	22.925546	11.75000
4	8	43.50	132.0	22.925546	5.43750

Average scores were used for ties.

Kruskal-Wallis Test	
Chi-Square	26.6213
DF	3
Pr > Chi-Square	<.0001

