The GLM Procedure

Class Level Information		
Class	**Levels**	**Values**
cylinders	5	3 4 5 6 8
origin	3	1 2 3
year	13	70 71 72 73 74 75 76 77 78 79 80 81 82

Number of Observations Read	392
Number of Observations Used	392

The GLM Procedure

Matrix Element Representation	
Dependent Variable: logmpg	
Effect	**Representation**
Intercept	Intercept
cylinders **3**	cylinders 3
cylinders **4**	cylinders 4
cylinders **5**	cylinders 5
cylinders **6**	cylinders 6
cylinders **8**	cylinders 8
weight	weight
acceleration	acceleration
year **70**	year 70
year **71**	year 71
year **72**	year 72
year **73**	year 73
year **74**	year 74
year **75**	year 75
year **76**	year 76
year **77**	year 77
year **78**	year 78
year **79**	year 79
year **80**	year 80
year **81**	year 81
year **82**	year 82
inv_horsepower	Dummy001
inv_displacement	Dummy002

The GLM Procedure

Dependent Variable: logmpg		
Tolerances		
Variable	Type I Tolerance	Type II Tolerance
Intercept	392	1.1407944536
cylinders 3	1	0.5237460577
cylinders 4	0.9893702259	0.0949564142
cylinders 5	0.9917166524	0.8461019531
cylinders 6	0.7025089606	0.2896299
cylinders 8	6.549969E-16	0
weight	0.1891118904	0.081243866
acceleration	0.6549779389	0.3461161706
year 70	0.9043496026	0.4780399865
year 71	0.9824706488	0.5334032833
year 72	0.9461171379	0.5146315507
year 73	0.9023607596	0.4269912276
year 74	0.9650340773	0.5332864675
year 75	0.9171119031	0.5096252776
year 76	0.9009130111	0.4834729288
year 77	0.8882556073	0.5293471693
year 78	0.8156830095	0.4753175147
year 79	0.7584953685	0.5182838969
year 80	0.7172788569	0.5471619878
year 81	0.5512399442	0.5400961433
year 82	1.346498E-15	0
Dummy001	0.1375513745	0.1249295887
Dummy002	0.080621257	0.080621257

The GLM Procedure

Dependent Variable: logmpg

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	20	41.39381760	2.06969088	201.21	<.0001
Error	371	3.81614342	0.01028610		
Corrected Total	391	45.20996102			

R-Square	Coeff Var	Root MSE	logmpg Mean
0.915591	3.273408	0.101420	3.098313

Source	DF	Type I SS	Mean Square	F Value	Pr > F
cylinders	4	32.04929962	8.01232490	778.95	<.0001
weight	1	3.75049524	3.75049524	364.62	<.0001
acceleration	1	0.14118134	0.14118134	13.73	0.0002
year	12	4.90560737	0.40880061	39.74	<.0001
inv_horsepower	1	0.38672088	0.38672088	37.60	<.0001
inv_displacement	1	0.16051315	0.16051315	15.60	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
cylinders	4	0.45368390	0.11342098	11.03	<.0001
weight	1	0.51513876	0.51513876	50.08	<.0001
acceleration	1	0.10123991	0.10123991	9.84	0.0018
year	12	4.66102253	0.38841854	37.76	<.0001
inv_horsepower	1	0.22211315	0.22211315	21.59	<.0001
inv_displacement	1	0.16051315	0.16051315	15.60	<.0001

Parameter		Estimate		Standard Error	t Value	Pr > |t|
Intercept		3.501914454	B	0.09495584	36.88	<.0001
cylinders	3	-0.288975238	B	0.07043073	-4.10	<.0001
cylinders	4	0.059714882	B	0.03325072	1.80	0.0733
cylinders	5	0.102949441	B	0.06390306	1.61	0.1080
cylinders	6	0.023161994	B	0.02329853	0.99	0.3208
cylinders	8	0.000000000	B	.	.	.
weight		-0.000149922		0.00002118	-7.08	<.0001
acceleration		-0.009913939		0.00316006	-3.14	0.0018
year	70	-0.312098691	B	0.02830636	-11.03	<.0001
year	71	-0.271956603	B	0.02769569	-9.82	<.0001
year	72	-0.316993577	B	0.02772621	-11.43	<.0001
year	73	-0.342320321	B	0.02589749	-13.22	<.0001
year	74	-0.259297514	B	0.02818778	-9.20	<.0001
year	75	-0.249170295	B	0.02699156	-9.23	<.0001

The GLM Procedure

Dependent Variable: logmpg

Parameter		Estimate		Standard Error	t Value	Pr > |t|
year	76	-0.230451986	B	0.02617588	-8.80	<.0001
year	77	-0.164916905	B	0.02733811	-6.03	<.0001
year	78	-0.165733293	B	0.02572766	-6.44	<.0001
year	79	-0.070250597	B	0.02718518	-2.58	0.0101
year	80	0.026124237	B	0.02734527	0.96	0.3400
year	81	-0.047929112	B	0.02706470	-1.77	0.0774
year	82	0.000000000	B	.	.	.
inv_horsepower		0.019177410		0.00412694	4.65	<.0001
inv_displacement		0.021705879		0.00549474	3.95	<.0001

Note: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.
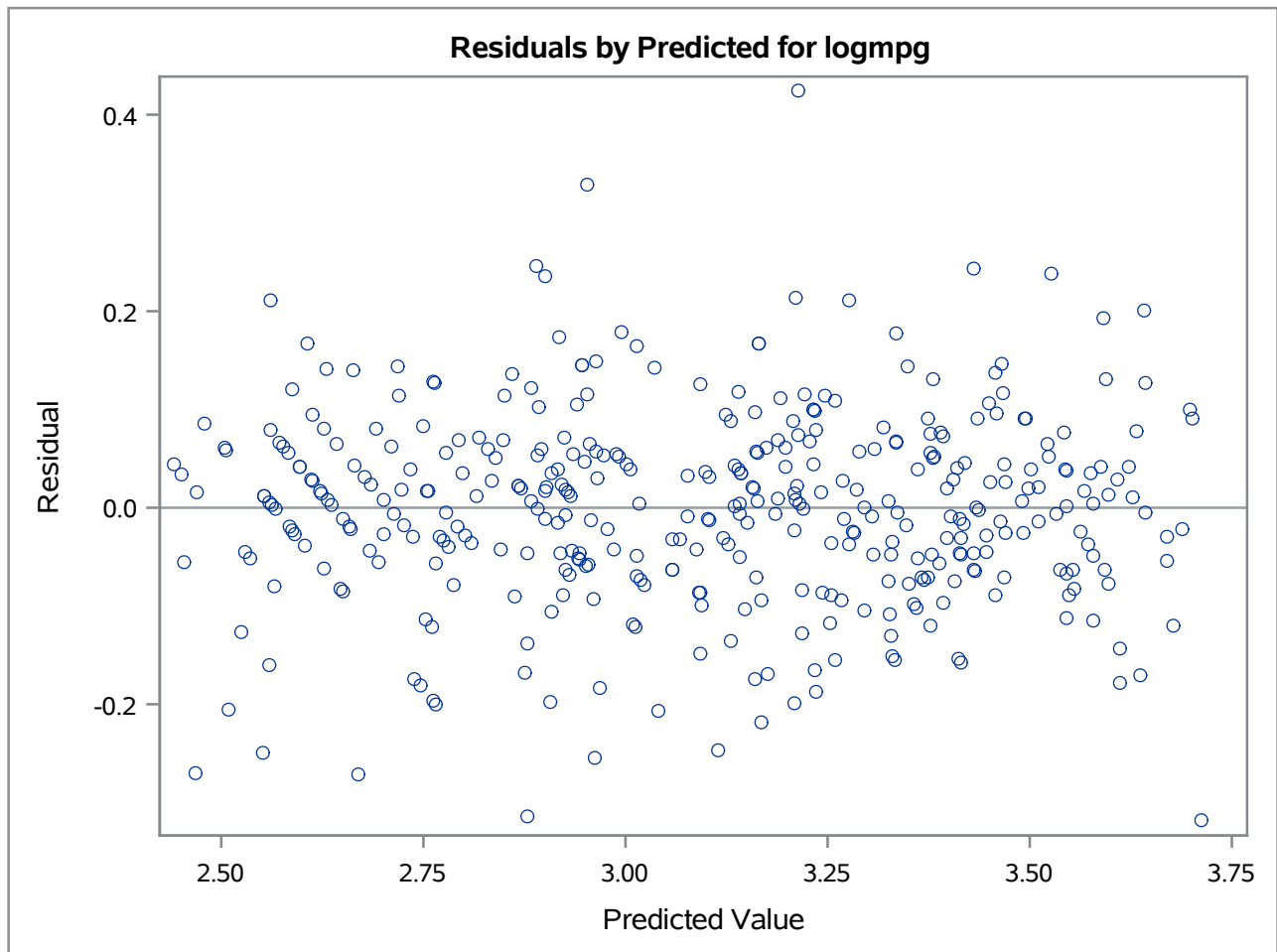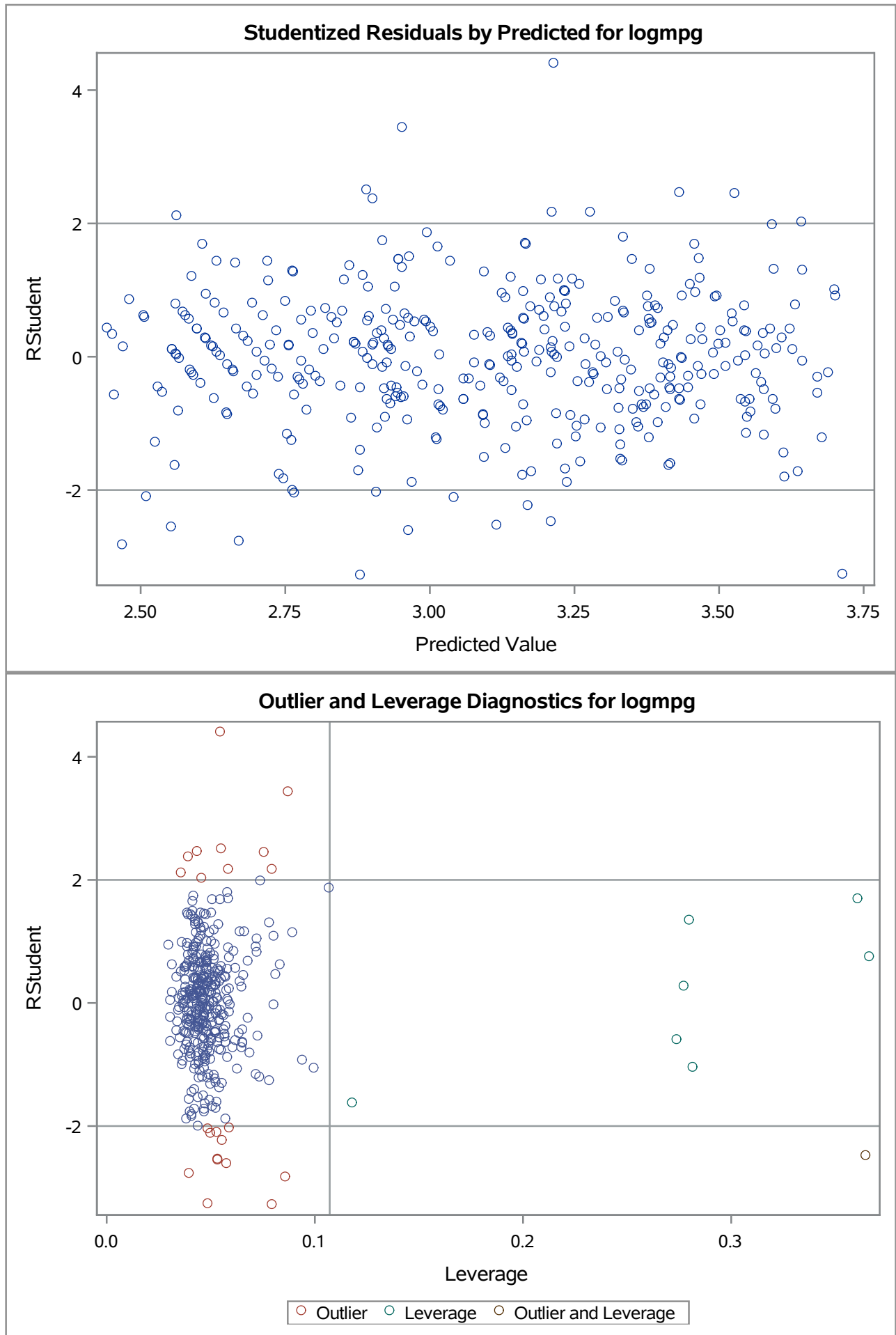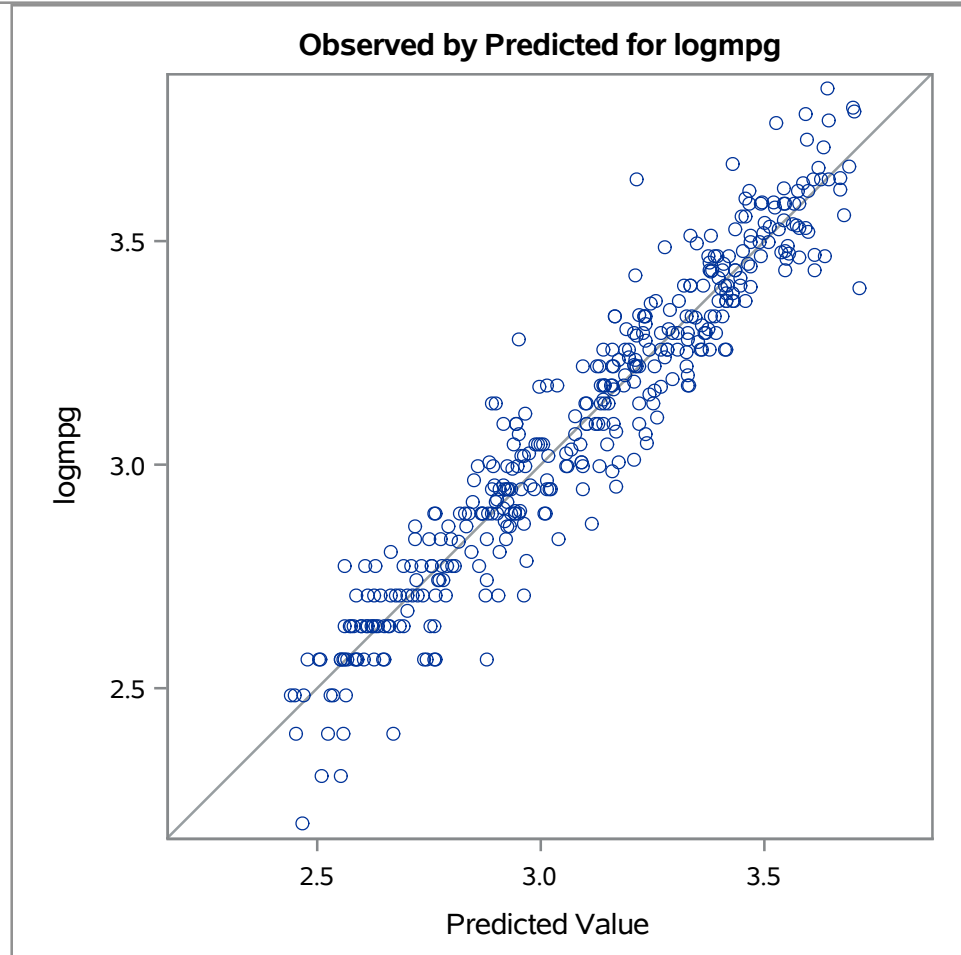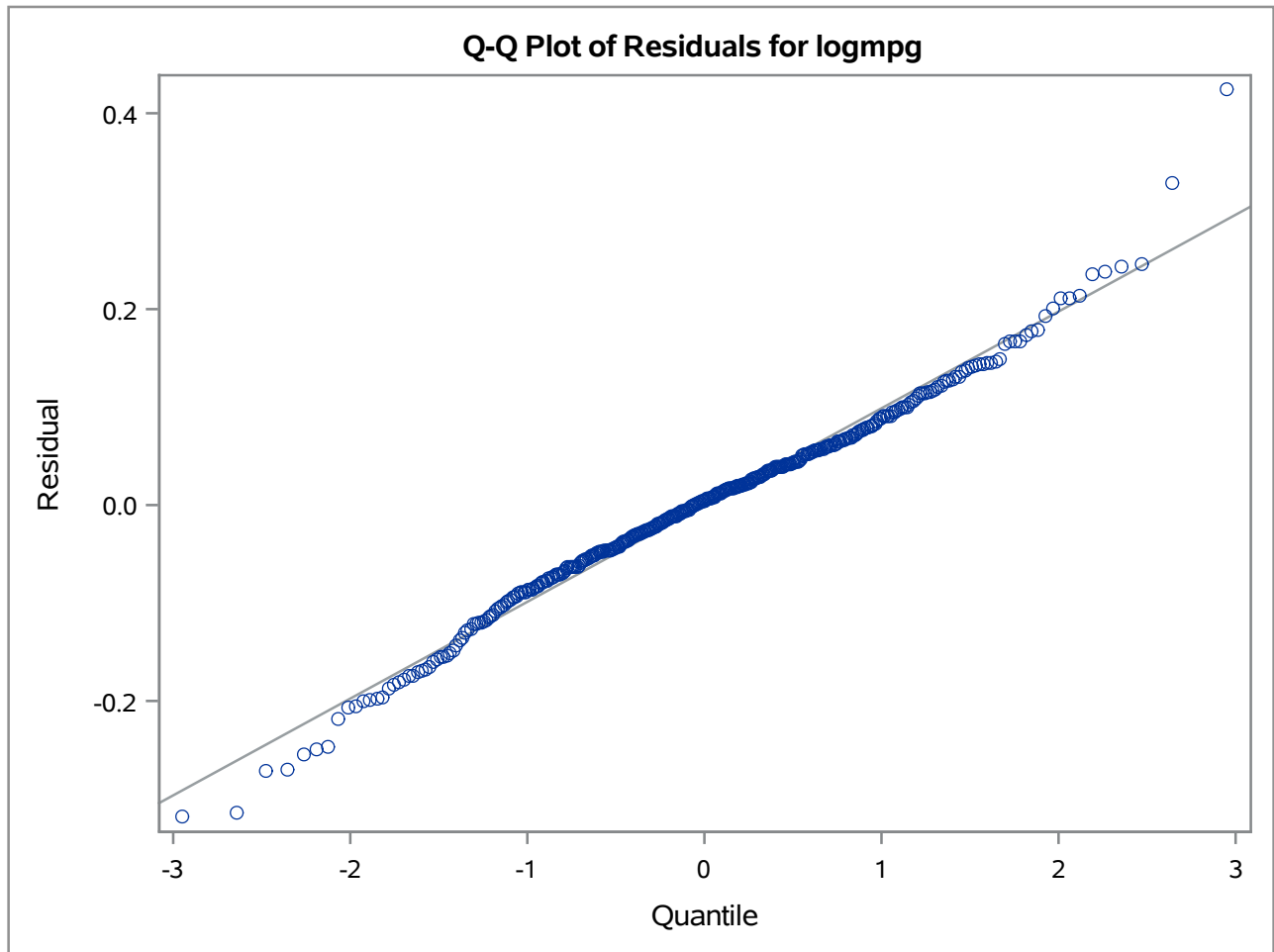

Residuals by Predicted for logmpg

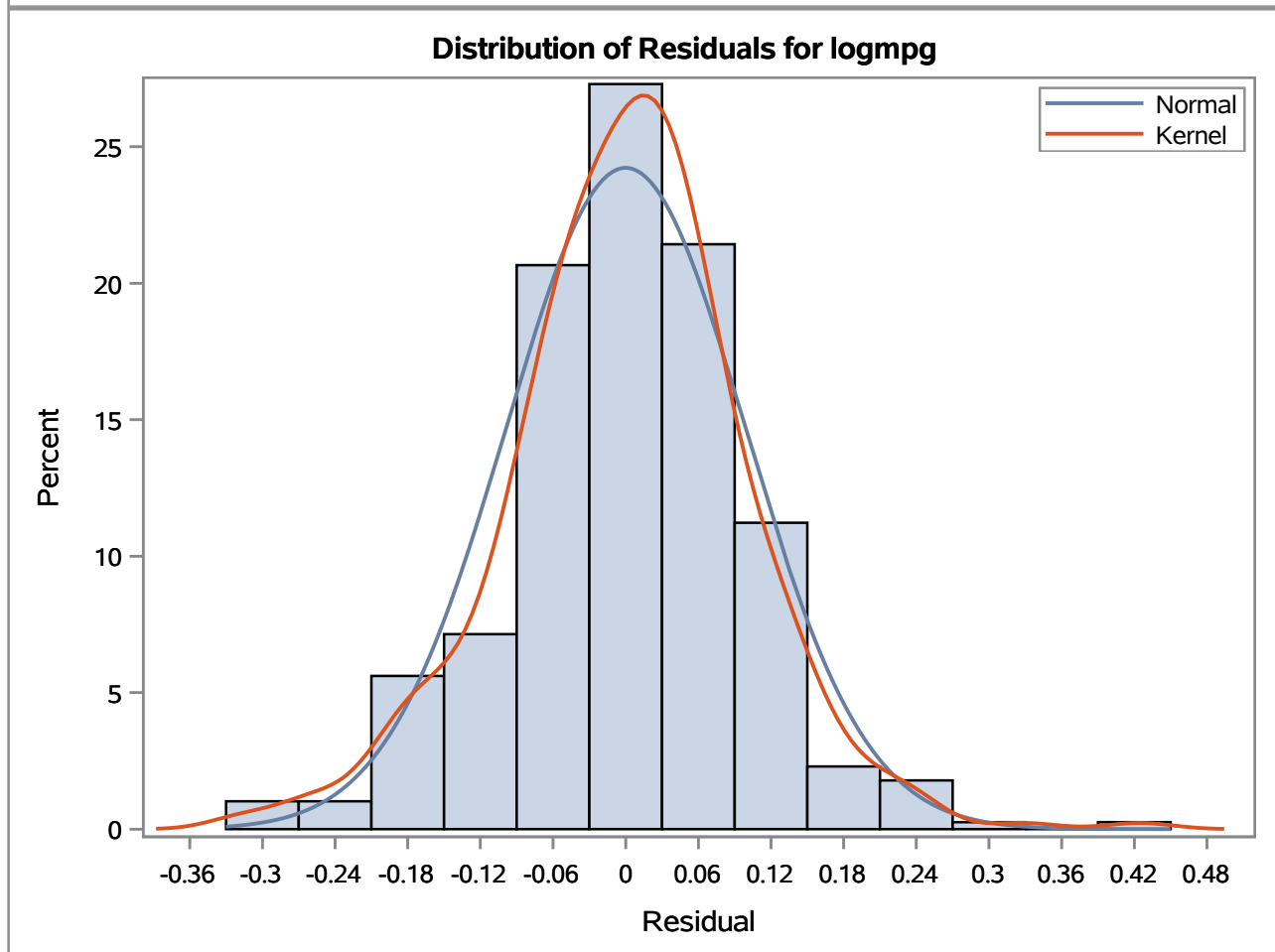# The GLM Procedure

Dependent Variable: logmpg

Studentized Residuals by Predicted for logmpg

Outlier and Leverage Diagnostics for logmpg

The GLM Procedure

Dependent Variable: logmpg

Q-Q Plot of Residuals for logmpg

Observed by Predicted for logmpg

The GLM Procedure

Dependent Variable: logmpg

Cook's D for logmpg

Distribution of Residuals for logmpg
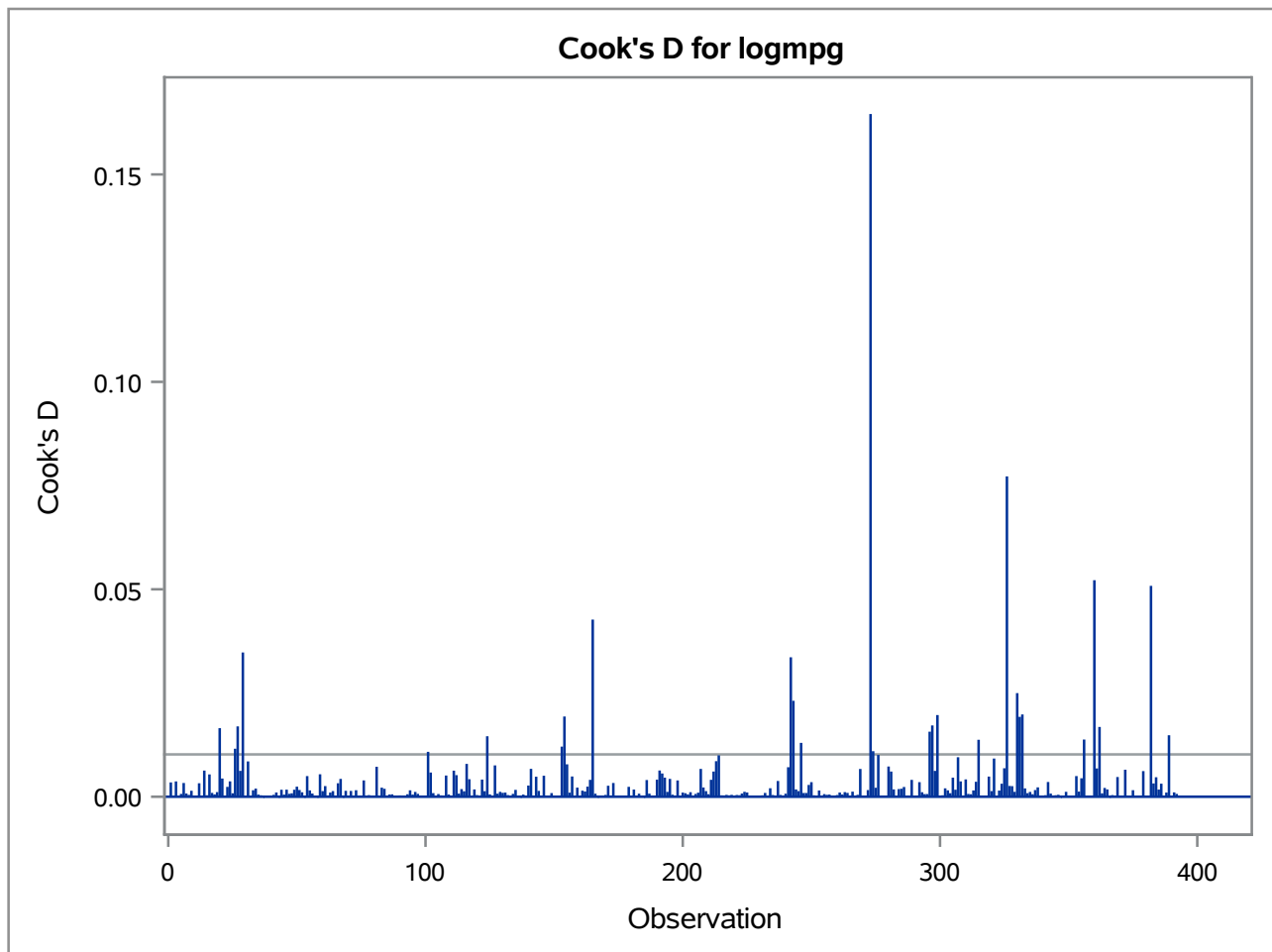
The GLM Procedure

Dependent Variable: logmpg

Residual-Fit Spread Plot for logmpg