Execution Environment

Author:	jbae7@ncsu.edu
File:	Linear Regression.ctk [temp]
SAS Context:	SAS Studio compute context
SAS Version:	V.04.00M0P031824
SAS Client:	SAS® Studio 6.0
SAS Locale:	
Submission Time:	Jan 22, 2025, 4:31:50 PM
Time Zone:	GMT-05:00
User Agent:	Chrome 131.0.0.0

Code:Linear Regression.ctk

```
/*
 *
 * Task code generated by SAS® Studio 6.0
 *
 * Generated on '1/22/25, 4:31 PM'
 * Generated on SAS version 'V.04.00M0P031824'
 * Generated on browser 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 Safari/537.36'
 * Generated on web client 'https://vfl-026.engage.sas.com/SASStudio/main?locale=en_US&launchedFromAppSwitcher=true&useTransitionSplash=true'
 */

ods noproctitle;
ods graphics / imagemap=on;

proc glmselect data=SASHELP.CARS outdesign(addinputvars)=Work.reg_design
        plots=(criterionpanel);
    class Type Origin DriveTrain / param=glm;
    model MSRP=EngineSize Cylinders Horsepower MPG_City MPG_Highway Weight
        Wheelbase Length Type Origin DriveTrain/ showpvalues selection=forward


(select=sbc);
run;

proc reg data=Work.reg_design alpha=0.05 plots(only)=(diagnostics residuals
        observedbypredicted);
    where Type is not missing and Origin is not missing and DriveTrain is not
        missing;
    ods select DiagnosticsPanel ResidualPlot ObservedByPredicted;
    model MSRP=&_GLSMOD /;
    run;
quit;

proc delete data=Work.reg_design;
run;
```

Log:Linear Regression.ctk

```
1    /* region: Generated preamble */
2    /* Make sure the current directory is writable */
3    data _null_;
4        length rc 4;
5        %let tworkloc="%sysfunc(getoption(work))";
6        rc=dlgcdir(&tworkloc);
7    run;
NOTE: The current working directory is now
      "/opt/sas/viya/config/var/tmp/compsrv/default/4b2629ad-fc4c-447c-b7d0-b2126aaefe89/SAS_work256300000200_sas-compute-server-317
      2e257-1a33-424f-9b86-a3b182fc0a8f-11991".
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      cpu time            0.00 seconds

8
9    /* Setup options */
10   title;
11   footnote;
12   options validvarname=any;
13   options validmemname=extend;
14   options dtreset date number;
15   options device=png;
16
17   /* Setup macro variables */
18   %let syscc=0;
19   %let _clientapp = %nrquote(%nrstr(SAS Studio));
20   %let _clientappabbrev = %nrquote(%nrstr(Studio));
21   %let _clientappversion=2024.03;
```

```
22   %let _clientversion=;
23   %let _sasservername=&SYSHOSTNAME;
24   %let _sashostname=&SYSHOSTNAME;
25   %let _sasprogramfilehost=&SYSHOSTNAME;
26   %let _clientuserid = %nrquote(%nrstr(jbae7@ncsu.edu));
27   %let _clientusername = %nrquote(%nrstr(jbae7@ncsu.edu));
28   %let clientmachine = %nrquote(%nrstr());
29   %let _clientmachine = %nrquote(%nrstr());
30   %let _clientmode = %nrquote(%nrstr(viya));
31   %let sasworklocation="%sysfunc(getoption(work))/";
32   filename _cwd &sasworklocation;
33   data _null_;
34       call symput('_sasworkingdir',pathname('_cwd'));
35   run;
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      cpu time            0.00 seconds

36   filename _cwd;
NOTE: Fileref _CWD has been deassigned.
37   %let _sasprogramfile = %nrquote(%nrstr());
38   %let _baseurl = %nrquote(%nrstr(https://vfl-026.engage.sas.com/SASStudio/));
39   %let _execenv = %nrquote(%nrstr(SASStudio));
40   %symdel _dataout_mime_type _dataout_name _dataout_url _dataout_table / nowarn;
41   %let _sasws_ = %bquote(%sysfunc(getoption(work)));
42   %let _saswstemp_ = %bquote(%sysfunc(getoption(work)));
43
44   /* Detect SAS/Graph and setup graph options */
45   data _null_;
46       length rc $255;
47       call symput("graphinit","");
48       call symput("graphterm","");
49       rc=tslvl('sasxgopt','n');
50       _error_=0;
51       if (rc^=' ') then do;
52           call symput("graphinit","goptions reset=all gsfname=_gsfname;");
53           call symput("graphterm","goptions noaccessible;");
54       end;
55   run;
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      cpu time            0.01 seconds

56   data _null_;
57       length rc 4;
58       rc=sysprod("PRODNUM002");
59       if (rc^=1) then do;
60           call symput("graphinit","");
61           call symput("graphterm","");
62       end;
63   run;
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      cpu time            0.00 seconds

64
65   /* Setup ODS destinations */
66   ods _all_ close;
67   %studio_results_directory;
68   filename _htmlout "&_results_prefix_..html";
69   filename _listout "&_results_prefix_..lst";
70   filename _gsfname temp;
71   filename _dataout "&_results_prefix_..dat";
72   ods autonavigate off;
73   ods graphics on;
74   ods html5 (id=web) METATEXT='http-equiv="Content-Security-Policy" content="default-src ''none''; style-src ''unsafe-inline''; 
74 ! img-src data: ;"' device=png gpath="&_saswstemp_" path="&_saswstemp_" encoding=utf8 file=_htmlout (title='Results:Linear 
74 ! Regression.ctk') style=Ignite options(bitmap_mode='inline' outline='on' svg_mode='inline' css_prefix=".ods_&SYS_COMPUTE_JOB_ID" 
74 !  body_id="div_&SYS_COMPUTE_JOB_ID" );
NOTE: Writing HTML5(WEB) Body file: _HTMLOUT
75   ods listing file=_listout;
76   &graphinit;
77   %studio_show_only_notes_wrapper;
NOTE: ODS statements in the SAS Studio environment may disable some output features.
80   %studio_initialize_custom_output;
81   /* endregion */
82
83   /*
84    *
85    * Task code generated by SAS® Studio 6.0
86    *
87    * Generated on '1/22/25, 4:31 PM'
88    * Generated on SAS version 'V.04.00M0P031824'
89    * Generated on browser 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/131.0.0.0 
89 ! Safari/537.36'
90    * Generated on web client
```

```
90 ! 'https://vfl-026.engage.sas.com/SASStudio/main?locale=en_US&launchedFromAppSwitcher=true&useTransitionSplash=true'
91    */
92
93   ods noproctitle;
94   ods graphics / imagemap=on;
95
96   proc glmselect data=SASHELP.CARS outdesign(addinputvars)=Work.reg_design
97   plots=(criterionpanel);
98   class Type Origin DriveTrain / param=glm;
99   model MSRP=EngineSize Cylinders Horsepower MPG_City MPG_Highway Weight
100  Wheelbase Length Type Origin DriveTrain/ showpvalues selection=forward
101
102
103  (select=sbc);
104  run;
NOTE: There were 428 observations read from the data set SASHELP.CARS.
NOTE: The data set WORK.REG_DESIGN has 428 observations and 22 variables.
NOTE: The PROCEDURE GLMSELECT printed pages 5-7.
NOTE: PROCEDURE GLMSELECT used (Total process time):
      real time           0.42 seconds
      cpu time            0.13 seconds

105
106  proc reg data=Work.reg_design alpha=0.05 plots(only)=(diagnostics residuals
107  observedbypredicted);
108  where Type is not missing and Origin is not missing and DriveTrain is not
109  missing;
110  ods select DiagnosticsPanel ResidualPlot ObservedByPredicted;
111  model MSRP=&_GLSMOD /;
112  run;
113  quit;
NOTE: PROCEDURE REG used (Total process time):
      real time           1.86 seconds
      cpu time            0.63 seconds

114
115  proc delete data=Work.reg_design;
116  run;
NOTE: Deleting WORK.REG_DESIGN (memtype=DATA).
NOTE: PROCEDURE DELETE used (Total process time):
      real time           0.00 seconds
      cpu time            0.00 seconds

117
118  /* region: Generated postamble */
119  /* Close ODS destinations */
120  &graphterm; ;*';*";*/;run;quit;
121  quit;run;
122  ods html5 (id=web) close;
123  ods listing close;
124  %if %sysfunc(fileref(_gsfname)) lt 0 %then %do;
125      filename _gsfname clear;
NOTE: Fileref _GSFNAME has been deassigned.
126  %end;
127  %studio_capture_custom_output;
128  /* endregion */
129
```

Results:Linear Regression.ctk

Data Set	SASHELP.CARS
Dependent Variable	MSRP
Selection Method	Forward
Select Criterion	SBC
Stop Criterion	SBC
Effect Hierarchy Enforced	None

Number of Observations Read	428
Number of Observations Used	426

Class Level Information		
Class	Levels	Values
Type	6	Hybrid SUV Sedan Sports Truck Wagon
Origin	3	Asia Europe USA
DriveTrain	3	All Front Rear

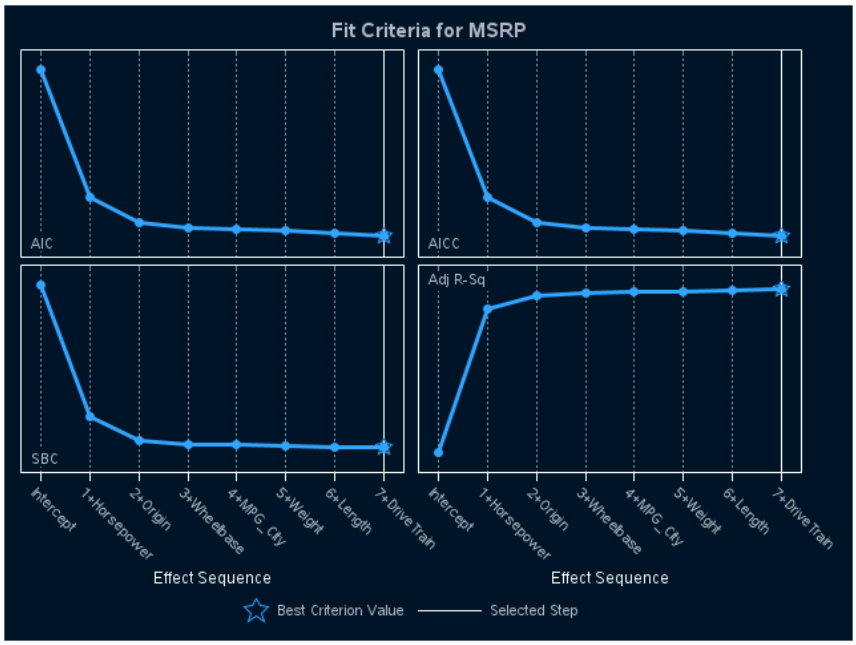
Dimensions	
Number of Effects	12

Dimensions	
Number of Parameters	21

Forward Selection Summary				
Step	Effect Entered	Number Effects In	Number Parms In	SBC
0	Intercept	1	1	8420.0498
1	Horsepower	2	2	7934.7825
2	Origin	3	4	7844.7304
3	Wheelbase	4	5	7828.6940
4	MPG_City	5	6	7828.0493
5	Weight	6	7	7825.0654
6	Length	7	8	7822.3748
7	DriveTrain	8	10	7818.3438*
* Optimal Value of Criterion				

Selection stopped at a local minimum of the SBC criterion.

Stop Details				
Candidate For	Effect	Candidate SBC		Compare SBC
Entry	Cylinders	7823.7768	>	7818.3438



Selected Model

The selected model is the model at the last step (Step 7).

Effects:	Intercept Horsepower MPG_City Weight Wheelbase Length Origin DriveTrain

Note: The p-values for parameters and effects are not adjusted for the fact that the terms in the model have been selected and so are generally liberal.

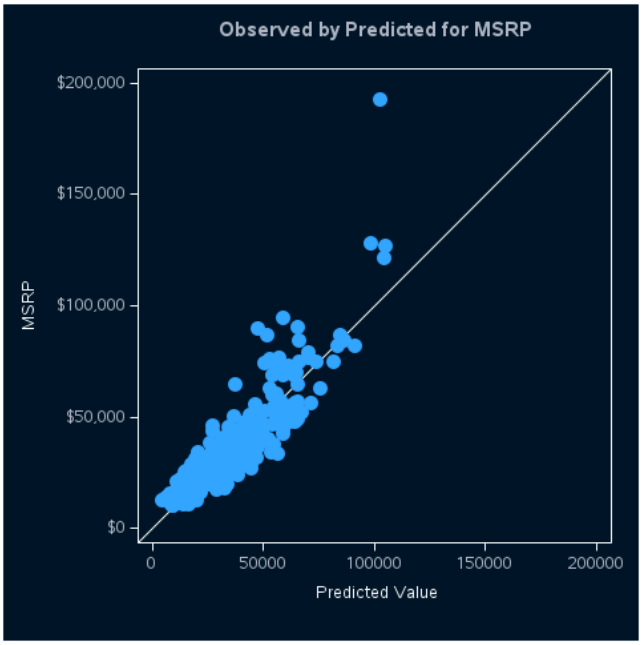
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.266152E11	14068357733	169.46	<.0001
Error	416	34534890899	83016565		
Corrected Total	425	1.611501E11			

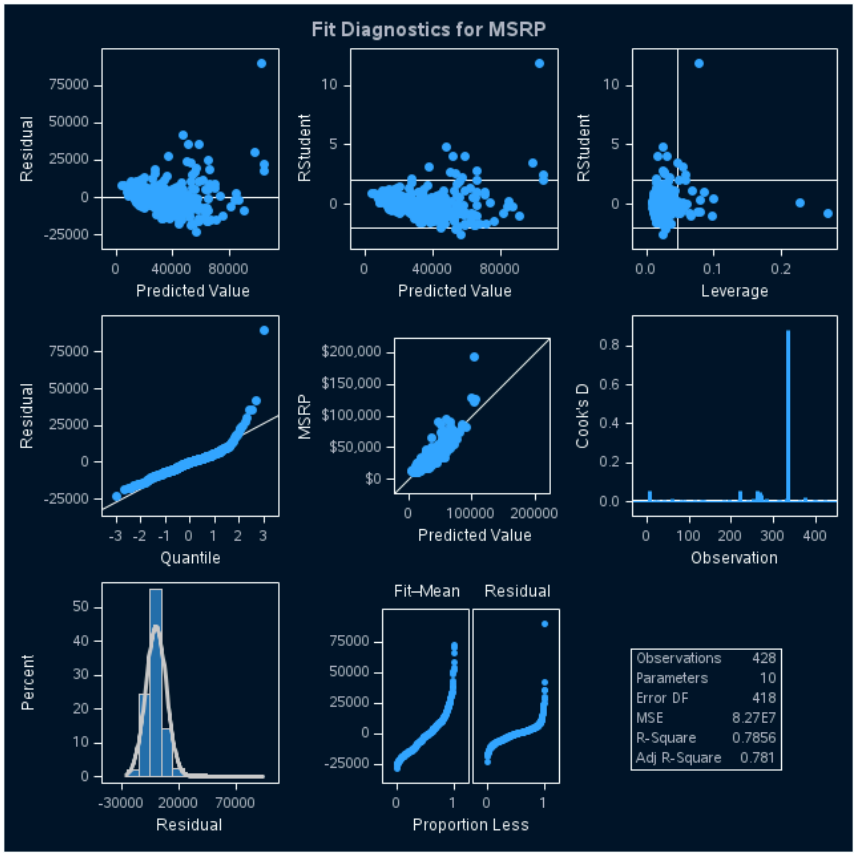
Root MSE	9111.34264
Dependent Mean	32805
R-Square	0.7857

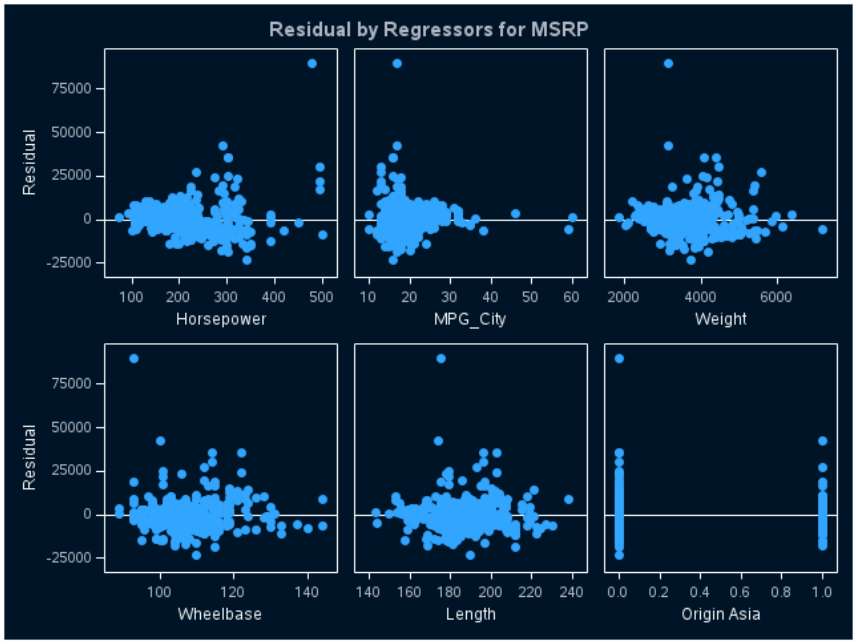
Adj R-Sq	0.7811
AIC	8205.79937
AICC	8206.43705
SBC	7818.34376

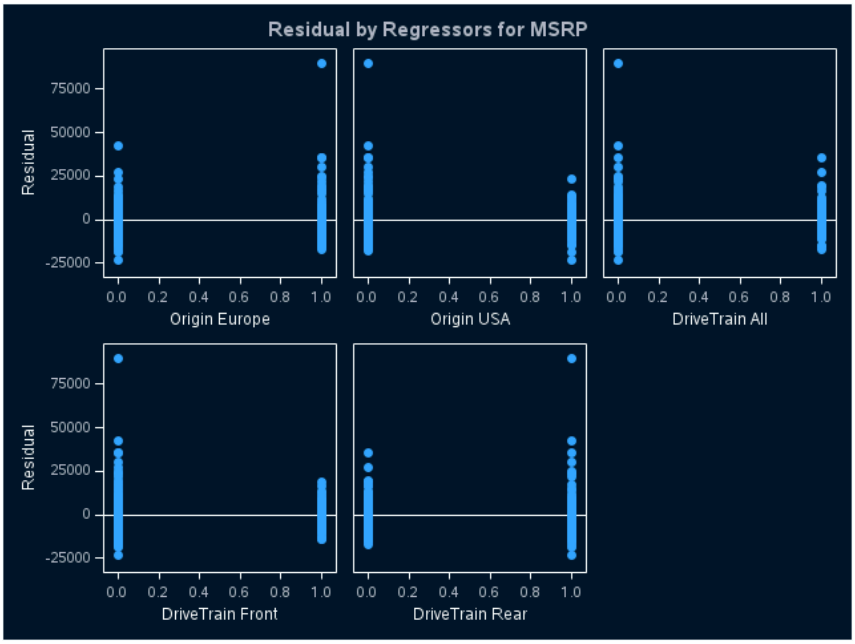
Parameter Estimates					
Parameter	DF	Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1610.259089	9406.590239	0.17	0.8642
Horsepower	1	204.996580	10.028426	20.44	<.0001
MPG_City	1	635.659713	141.578582	4.49	<.0001
Weight	1	5.345903	1.353542	3.95	<.0001
Wheelbase	1	-831.412834	135.676100	-6.13	<.0001
Length	1	245.522812	72.594469	3.38	0.0008
Origin Asia	1	-552.556749	1132.595046	-0.49	0.6259
Origin Europe	1	10106	1305.353705	7.74	<.0001
Origin USA	0	0	.	.	.
DriveTrain All	1	-4348.154787	1510.108082	-2.88	0.0042
DriveTrain Front	1	-4856.741492	1251.083894	-3.88	0.0001
DriveTrain Rear	0	0	.	.	.

Model: MODEL1
Dependent Variable: MSRP




Fit Diagnostics for MSRP
Residual
Predicted Value
RStudent
Predicted Value
RStudent
Leverage
Residual
Quantile
MSRP
Predicted Value
Cook's D
Observation
Percent
Residual
Fit–Mean
Residual
Proportion Less
Observations 428
Parameters 10
Error DF 418
MSE 8.27E7
R-Square 0.7856
Adj R-Square 0.781


Residual by Regressors for MSRP
Residual
Horsepower
MPG_City
Weight
Residual
Wheelbase
Length
Origin Asia


Residual by Regressors for MSRP
Residual
75000
50000
25000
0
-25000
0.0
0.2
0.4
0.6
0.8
1.0
Origin Europe
Origin USA
DriveTrain All
DriveTrain Front
DriveTrain Rear